

sinergie

italian journal of management

Vol. 41
Issue 3

SEPT-DEC
2023



Italian Society of
MANAGEMENT



Official Journal of Italian Society of Management

sinergie

italian journal of management

Official journal of Italian Society of Management

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| VOL. 41 ISSUE 3 N. 122 | Sinergie IJM's Essays | SEPT-DEC 2023 |
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Sinergie Italian Journal of Management is a peer-reviewed scholarly publication focusing on the principal trends in management studies.

Formerly *Sinergie rivista di studi e ricerche*

Published quarterly

Founded in 1983

ISSN 0393-5108 - ISSN 2785-549X

Open access at www.sijm.it

Indexed in Scopus (as from 2021), Google Scholar, ACNP, ESSPER



Sinergie Italian journal of management is published by Fondazione CUEIM, a foundation aiming to carry out and to promote scientific research, especially in the fields of business administration and of organizations management, both profit and non profit.



Sinergie Italian journal of management is the official journal of SIMA, the Scientific Society of Italian Professors of Management, whose aim is to contribute to the development and dissemination of management knowledge in the academic, economic and social fields, on an excellence basis.



The editing activity is sponsored by Consorzio Universitario di Economia Industriale e Manageriale - CUEIM - www.cueim.it



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Aphorisms

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italian journal of management
Vol. 41, Issue 3, 2023

1. *The two most powerful warriors are patience and time.*
(Lev Tolstoj)
2. *Be yourself; everyone else is already taken.*
(Oscar Wilde)
3. *Education's purpose is to replace an empty mind with an open one.*
(Malcolm Forbes)
4. *Laughter is the shortest distance between two people.*
(Victor Borge)
5. *Whenever you find yourself on the side of the majority, it's time to pause and reflect.*
(Mark Twain)

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italian journal of management

ISSN print 0393-5108

ISSN online 2785-549X

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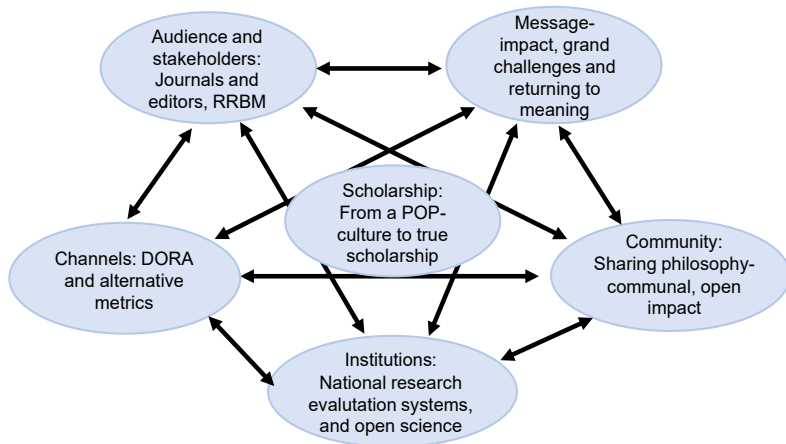
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Sibel Yamak - Morten Huse

Let us start by reminding ourselves what research is! It typically should start with the identification of a relevant research question and continue with the assessment of the state of the art on this specific topic. Then, follows designing the research methods. The data collection and analysis are followed by the discussion of the findings by comparing them with the existing knowledge and thus offering a new contribution. When this is completed, the dissemination comes into play. The dissemination can for example be a book, a paper, a conference presentation, a blog, a report or a discussion. Eventually, the research and its dissemination may contribute to make change. Although the research process is long and complex and it comprises many subcomponents, we often hear scholars mentioning that they are “publishing a paper”. Why has the last phase of conducting research gained precedence over the others? In the late 1980s and the early 1990s period, academic research started to be evaluated and quantified (Tsui and McKiernan, 2022). Instead of the traditional channels for disseminating research, such as books and policy papers, the focus shifted to assessing the perceived quality of academic journals using metrics like the Journal Impact Factor (Tsui and McKiernan, 2022). This marked the beginning of a continuing trend in academia, where scholars increasingly prioritized publishing in prestigious journals while diminishing the reliance on other forms of publication. The publish-or-perish culture (POP-culture) supported by all kind of rankings and metrics has created an unfriendly environment for relevant research. Support for the mainstream formulaic research, limited room for qualitative and longitudinal studies and the limited use of innovative methods, are some of the shortcomings of the POP-culture. The present publish-or-perish culture distances scholars from the research development stage and urges scholars to focus on a research dissemination stage. Perceived prestigious or top tier journal publications are given priority. This further restricts the choices for the research.

Management scholarship is increasingly under scrutiny as criticism abounds. Academia has lost reflection, and scholars are becoming publishing technicians. Most researchers predominantly continue with their research endeavors in a conventional manner. They concentrate on addressing gaps in existing literature while constructing and refining theories that often lack clear links to practical application (Tsui and McKiernan, 2022). There is an erosion of faith in the academic labour procedure (Ozbilgin, 2009). First, due the decline in the vocational professional nature and emphasis on public contribution in academic endeavours. Second, due to the emergence of self-serving and profit-oriented principles. Thus, there is an urge to return to meaning (Alvesson and Sandberg, 2012; Alvesson *et al.*, 2017; Brabet *et al.*, 2021; Huse, 2020; Tourish, 2019). During the last decades several initiatives have emerged. They contribute to developing ways of rethinking management scholarship. Champions for change argue about

the existence of a crisis. The main initiatives are addressing challenges about the institutions, the audience, the message, the channels, and the scholarly community (Huse, 2020). These are briefly presented in the following sections.



To change the equilibrium from the POP-culture to true scholarship, synchronized actions by key actors are needed. As scholars, we need to decipher the scholarly ecosystem and its components. It is important to identify the characteristics of the actors who are willing and able to initiate change, and the type of initiatives they are taking. However, the initiatives may represent global or disciplinary variations. Initial question would be then who are setting the standards in the institutions?

Institutions - Who are setting the standards for a sustainable system for assessing research at universities and business schools?

Initiatives to change institutions can take place at several levels. Initiatives include transnational regulations, national evaluation systems, accreditations agencies and various private or voluntary endeavors. The European Foundation for Management Development (EFMD), the Declaration of Research Assessment (DORA) and Responsible Research in Business and Management (RRBM) represent examples of important initiatives. Institutional impacts happen over time, and they have the potential to influence each other.

National research evaluation systems

Evaluation systems for higher education exist in many countries. National research evaluation systems typically make universities to systematically rank journals and scholars, and they position academic institutions as an extension of the dominant discourse of neoliberal meritocracy (Lorenz, 2012; Martini and Robertson, 2022). However, these metrics and ranking based systems may have significant unintended negative consequences. Such consequences may include that of inducing

researchers to prioritize quantity over quality, undermining societal impact, avoiding time demanding research designs (longitudinal or interdisciplinary), and opting for quick fixes, undermining research ethics (Moosa, 2018). The pressure of the metrics increases academic misconduct cases. Concerns regarding the credibility of the research findings have been raised by many scholars (e.g. Schwab and Starbuck, 2017; Tsui and McKiernan, 2022).

However, there are also diverging and promising initiatives from some of the major actors in the national systems. This is for example the case in France through The French National Centre for Scientific Research (CNRS) (Brabet *et al.*, 2021). To avoid the shortcomings of the existing metrics and journal publication focused assessment systems, CNRS has required its researchers to exclusively present their open access publications for the assessment of their performance. The quantity of papers submitted for assessment should also be minimized. CNRS collaborates with dependable experts for the assessment of these research outputs. This evaluation encompasses more than just journal articles and includes books and as well as other varieties of research outputs.

Open science initiatives¹

'Open science' are initiatives to make scientific research and its dissemination accessible. Open science highlights transparent and accessible knowledge, and that science should be shared and developed through collaborative networks. Suggested principles for open science include open methodology, open source, open data, open access, open peer review, and open educational resources (Kraker *et al.*, 2011). Open data encompass practices such as publishing open research practices, making research data available, campaigning for open access, and generally encouraging scientists to making it easier to publish and communicate scientific knowledge. It may be considered as one of the ways to democratize the knowledge generation and diffusion against the commodification and privatization of research within the boundaries of the traditional publishing industry that are protected by high paywalls (Brabet *et al.*, 2021; Tennant *et al.*, 2020).

There are also revolutionary initiatives such as the Octopus Platform. This platform was launched in 2022 with the funding of UK Research and Innovation (UKRI). The Octopus platform is a new generation publishing platform with the claim of being a free, fast, and fair outlet for primary research. Some of the objectives for the platform are to eliminate high costs and the barricades to quick information sharing, to incentivize all research outputs, to prioritize reproducibility, to address biases of positive results versus replications or negative results, to eliminate institutional bias and publication language restrictions, to improve real world application, to enable a fair and transparent review process, and to prioritize quality over quantity of research outputs (Octopus Platform, 2022). Such initiatives can enable a direct interaction with the researcher, reviewer, and the larger

¹ See <https://libereurope.eu/wp-content/uploads/2017/12/LIBER-FAIR-Data.pdf> for the FAIR principles and <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/open-science-open-access> for EU open science initiatives

scholarly community. These initiatives can initiate further changes which may get us closer to knowledge democracies.

Audience - Who do we conduct research for? Not only for a narrow group of scholars, but also for practice

The wide gap between research and practice in management research has long been criticized. Various suggestions and initiatives are made to include other stakeholders than just a narrow group of scholars. Discussions of the causes and potential solutions to bridge this gap, have for a long time been widely debated (Rynes, Bartunek and Daft, 2001). The discussions have taken place under various connotations such as impact, usefulness, theory-practice divide and rigor-relevance debate (Bartunek and Rynes, 2014). Researchers and practitioners often live in two different knowledge worlds, and there are significant problems in knowledge production and transfer. Researchers usually investigate generalisable problems that are as context free as possible. Practitioners often apply information that is custom-made to a particular location and time frame. The location and timeframe are frequently customized, derived from real-life encounters, and tailored to particular situations (McKelvey, 2006). To bridge the theory and practice gap, engaged scholarship has been offered as a viable solution. Engaged scholarship may also allow the re-examination of researcher assumptions and researcher self-reflection (Van de Ven and Johnson, 2006). Engaged scholarship has a focus on pertinent inquiries rooted in the real world and it is formulated through the establishment of a collaborative learning community and the utilization of diverse models and techniques. There is a continuing debate on how to bridge the theory-practice gap.

Journals and editors: Forums or special issues

Journals and journal editors have for several years shown concerns for the lack of including stakeholders in management journals and publications. For example, the number of forums and special issues on academic-practitioner relations has virtually exploded since the turn of the millennium (Bartunek and Rynes, 2014).

RRBM²

Another action questioning for whom we are conducting research and how the research can be more meaningful has been initiated by RRBM. RRBM is a virtual organization founded as a reaction to two main problems in management research, namely its scientific credibility and its usefulness (Tsui, 2018; Tsui and McKiernan, 2022). It was developed by twenty-four leading scholars, but RRBM has later in its summits brought together journal editors, deans of business schools, management associations' leaders, heads of accreditation institutions and prominent scholars. They have jointly discussed and elaborated the rules and actions for responsible research in business and management.

² RRBM and the audience <https://www.rrbm.network/>

The participants crafted 'I Will' or 'We Will' statements as commitments to rectify undesirable research practices or to initiate constructive actions aimed at enhancing the credibility and utility of their research (RRBM Summit Report, 2019, 2021). It is now joined by a growing community of scholars from all over the world. RRBM is supported by many partners, including accreditation organizations as AACSB and EFMD. The latter for example, contributed to the seven principles of RRBM. These are service to society, valuing both basic and applied contributions, valuing plurality and multidisciplinary collaboration, sound methodology, stakeholder involvement, impact on stakeholders and broad dissemination. Four of the principles focus primarily on the usefulness of knowledge for the wellbeing of society, and three of them on the credibility of knowledge. The RRBM organization emphasizes engagement with practice. RRBM involves a wide range of stakeholders into research, valuing indigenous and practitioner knowledge and addressing the grand challenges to produce responsible science. RRBM's objective is to ensure responsible research with the production of credible and relevant knowledge that can be used by policy makers, business, and non-business organizations. It promotes positive business and management practices which can ultimately contribute to the wellbeing of society. RRBM calls for actions to transform business and management research toward achieving humanity's highest aspirations for a better world.

Message - What do we communicate? From getting published to meaningful research

Several scholars have made crusades against the lack of meaning in the POP-culture. Some go far in arguing that a new science of management research is needed (Brabet *et al.*, 2021; Starkey, Hatchuel and Tempest, 2009). Pettigrew and Alvesson argue in several publications that we need to rethink our professional norms, and we need to cultivate a more scholarly identity. They are focusing the needs for meaningful, reflecting, and impactful research.

Existential research and grand challenges

Scholars often voice an identity crisis in academia, raising questions about the ethicality and relevance of academic research within the current publication system, along with the value generated by this system (Brabet *et al.*, 2021; Huse, 2020; Tourish, 2019; Tsui and McKiernan, 2022). These concerns are prominent in discussions and initiatives orchestrated by different academic associations as well as in the works of numerous academics (for example Alvesson *et al.*, 2017; Huse, 2020; Tourish, 2019; Tsui and McKiernan, 2022). Voices are raised that we in our research should address the great challenges in society. Grand challenges include existential risks, such as the ones that can bring an end to humanity. Examples are nuclear catastrophes by accidents or wars, climate change, destruction of the natural environment, and unintended consequences of artificial intelligence. However, they also include challenges such as

pandemics, inequality, poverty, ecological imbalances, and socio-economic and political crises. We can approach these issues through seeing new and interesting avenues for research, but even more important, through making them the core part of why we do research. Current situation in management research seems to be quite the contrary. In a recent study, Harley and Fleming (2021) have found that only 2.8% of the articles in prestigious journals have addressed grand challenges. According to them, this shortcoming is due to the relationship between business school practices and journal norms.

The principles of neoliberalism and dominant economic viewpoints which are emphasizing growth and profitability lacking a holistic approach (Costanzo *et al.*, 2005), are also mirrored in the field of management research. This is further exacerbated by the advent of the neoliberal business school (Alakavuklar *et al.*, 2017). Willmott (1995) points to a growing trend towards the commercialization of higher education. This is encompassing both teaching and research. The current academic emphasis is criticized for limiting the societal contribution of business schools (Jack, 2020). Ongoing discussions about critical impact and intellectual advocacy highlight the historical and political ties between academic endeavours and neoliberal dominance (Contu, 2020). Ranking systems and managerialism within business schools together with their positioning within the context of the neoliberal global landscape, have contributed to the detachment from meaning in research. This current situation necessitates a call for scholars to challenge prevailing notions and to promote alternative concepts. The call is for a more liberated, equitable, inclusive and progressive global landscape.

To overcome the scholarly identity crisis, we as scholars can start by challenging the status quo and the ideological and moral basis of common knowledge about society, organizations, and management. This necessitates asking uncomfortable questions that may challenge dominant views, fads and taken for granted assumptions about management. Being curious and dubious about everything may be the key to becoming an accomplished and mature scholar. A useful way of doing this may be to learn about the historical origin of practices and theories. We as scholars should check whether our research serves as a means of legitimizing ideologies, groups, activities, subjects, and skills. An important point is to be aware of the performativity of social science theories. How a theory describes the world creates a world in line with the theory as stated by Ghoshal (2005). A bad theory may have detrimental effects on practice. Furthermore, research needs to take into consideration the specific circumstances of each context. It is crucial to understand and value indigenous perspectives. Given the Euro-American duopoly in the production of academic output (Heilbron and Gingras, 2018), there seems to be a huge gap in terms of incorporating alternative perspectives and contexts into our knowledge base. The context as geography, history, and relationships matters, and it needs to be keenly addressed.

Steps like these may help us, as researchers, distance ourselves from existing ahistorical and context-free works and may lead us toward emancipatory and humanizing research. Through emancipatory

research, we can create knowledge that can benefit disadvantaged groups. Emancipatory research can advance and institutionalize equality, fairness, and social justice (Ozbilgin *et al.*, 2022). It can initiate liberating change for those who need it most. Furthermore, through humanizing research we can better grasp the complex nature of the human being. We need to include human needs and expectations in our analyses. We are invited to see distinct representations and identify ways to avoid any reductionist perspective that reduces human to a single dimension.

The richness in perspectives can act as important tools in addressing grand challenges regarding social and environmental sustainability. It can enable us to identify wider groups of stakeholders who are affected by the topic of research, and it can promote collaborations, and thus facilitate more incorporation of stakeholder views in the research.

Returning to meaning and polymorphic research

Management research with its POP-culture has been presented as an insular, self-referential pattern of producing academic work within a secluded academic environment (Hambrick, 1994). Mats Alvesson has presented some of the strongest critical voices against the POP-culture. He has been calling for meaningful research. Alvesson and Gabriel (2013) argue that our research is too much about gap-spotting instead of path-setting. They argue for polymorphic research, less formulaic research, and a nomadic research trajectory. Scholars need to be curious and courageous to try new methods and paths.

Key virtues in polymorphic research are openness and curiosity. The major point of polymorphism is to create alternative ways of thinking and writing research. Polymorphic research acknowledges uncertainties and doubts, has a method based on reflexivity, is aiming at non-standardized text productions, and is addressing a broad audience (Huse, 2020; Huse and de Silva, 2023).

Channels - How do we disseminate our knowledge? The metrics being used beyond publishing in prestigious journals

The use of impact assessments can bring many benefits. However, there are unintended consequences that may be harming scholarship and flawing the scholarly system. One line of discussions is that of metrics and academic ranking, and how ranking systems are leading to scientific misconduct (Bedeian *et al.*, 2010; Tsui and McKiernan, 2022). Furthermore, present impact assessments may also lead to an overemphasis of citations (Brabet *et al.*, 2020), an undermining of open access and diversity (Larivière, *et al.*, 2015), a neglect of societal challenges as research topics and a limitation of available theories and methodologies to be used (Harley and Fleming, 2021). Harley and Fleming (2021) define and problematize the process of socialisation of young scholars who become familiar with the intricacies of academic publishing. Young scholars develop a keen understanding of the metrics by which their professional achievements will be evaluated. Thus, they attribute a particular importance to the concept of secure papers or

secure subjects. These secure areas refer to topics of research that align with well-established fields of perceived valid academic inquiry with the highest likelihood of being accepted by reputable journals (Harley and Fleming, 2021; McKiernan & Tsui, 2019). It is worth noting that the topics related to grand challenges do not seem to be among these perceived secure subjects (Harley and Fleming, 2021). Tsui and McKiernan (2022) also stress the increasing scepticism surrounding the accuracy of published research findings and the disparity between the subjects investigated and the actual requirements of society or the business world.

There are also initiatives that question the use of metrics. Most powerful initiatives to change the metrics are from DORA and Anne-Wil Harzing.

DORA - The San Francisco Declaration³

DORA (The San Francisco Declaration of Research Assessment) is highlighting the problems arising due to journal metrics. DORA seeks to challenge the undue influence of JIF (Journal Impact Factor) as the main but flawed criterion for research assessment. The ambition of DORA is towards changing practice in research assessment, which involves changing the academic culture and behavior to ensure that hiring, promotion and funding decisions focus on the qualities of the research and scholarship. DORA focuses on insight, impact, reliability, and reusability rather than what they call questionable proxies. It urges participants in the research community to evaluate research based on its inherent value. This implies that scholars should take direct responsibility for assessment rather than outsourcing this crucial task to metrics as journal impact factors (JIF). The DORA guidance includes approaching funding agencies and institutions, publishers, metrics providers and researchers. DORA is addressing challenges on a global and multi-disciplinary scale, and it aims to establish globally supporting communities.

Beyond traditional metrics

Anne-Will Harzing has a reputation for renewing ways bibliometrics can be used to assess academic performance. She has, through several contributions, shown the problems of the JIF ranking system. The use of journal lists and the classification of perceived elite journals is the core of JIF. Adler and Harzing (2009) report that current ranking systems are dysfunctional and potentially cause more harm than good. They show the arbitrary nature of JIF as a ranking system, and they invite the worldwide community of scholars to innovate and design more reliable ways to assess scholarly contributions. They raise critical questions about which publications are included in various JIF categories, and they argue that evaluation criteria need to become more global and comprehensive.

³ The presentation of DORA is based on extractions from DORA's home pages: <https://sfdora.org/>

Many of our scholarly community leaders, as former AOM and EURAM presidents, have voiced their concerns reflected in the above-mentioned initiatives. They have echoed that the scholarly community should be responsible, vibrant, and engaged. Discussions at the EURAM presidential meetings have stressed the fact that rankings have driven an undermining of true scholarship (Huse, 2020). The holistic and multifaceted role of scholarship has been reduced into a publishing game.

There is a recent call from many scholars (Harley, 2019; Huse, 2020; McKiernan and Tsui, 2019) that senior scholars should use their experiences to develop the younger. Mentoring roles can enhance the transfer and exchange of knowledge and experience between senior and younger scholars and peers. We should believe in the training of scholars which is a lifelong training period. It is a main issue to develop a community that enables collective action and change - a community that is educating hearts. This means in practice that a life-cycle perspective of scholarship should be taken.

Creating a new game with passion and compassion

Huse (2020) identifies a new game of doing research: the sharing philosophy. The sharing philosophy is communal, open and impact driven. The communal approach is about development of the scholarly community and about programmatic approaches to research. It is not about individual credits. The open approach is about open innovation, and it is holistic. It is an integration of head, heart and hands and the importance of passion and compassion. Collaborating with young scholars and their development is important. The impact driven approach has a focus on the importance of societal impact and contributions, and that our research community should be directed towards the welfare and well-being across the world. It is characterized by working not only for, but also with stakeholders.

Is this a new game of doing research? Or is this a return to the past of true scholarship? This is not isomorphism or only an adjustment of the existing game, but it is a rethinking of our professional norms. Scholarship is not something we do, but something we are. This is a call for senior scholars and community leaders to be champions for true scholarship.

From a POP-culture to true scholarship

We have in this contribution addressed how various factors including the neo-liberal influence in academia, are contributing to the destruction of true scholarship. Metrics, the ranking of journals, scholars and universities have taken the international academic society into a publish-or-perish culture where scholars are becoming publishing technicians. True scholarship focusing on holistic assessments of and contributions to grand challenges, development of people and reflections, is not given priority. We are witnessing a phenomenon where academic faculty members are

receiving credit for publishing numerous publications in a very short period of time rather than for their contributions to reflections and knowledge creation. The publications of papers in ranked journals have in our neo-liberal academic reality been a main criterion for the ranking of scholarship. Academia has lost reflection with scholars becoming publishing technicians. Thus, there is an urge to return to meaning.

We have in this contribution communicated that we do not think that the POP-culture is sustainable. However, we have tried to present that there may be some lights in the tunnel. We have presented routes that may be helpful for getting out of the POP-culture and the neo-liberal influence in universities and business schools. Recently, we have met many of the developments and challenges of artificial intelligence. Artificial intelligence and machine learning can further exacerbate the existing publishing game. However, artificial intelligence may also become a tool for returning to true scholarship, including polymorphic research, ensuring stakeholder involvement, dynamic fruitful collaborations, and scholarly reflections. Let us do research and remember that true scholarship goes beyond what machines and technical publishing can do.

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Academic or professional positions and contacts

sinergie
italian journal of management

ISSN 0393-5108
ISSN 2785-549X
DOI 10.7433/s122.2023.01
pp. 11-22



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Original Research Papers

In search of normative goal alignment within organisations: the role of employee seniority and identification with the leader

Received
26th August 2022

Revised
2nd May 2023

Accepted
26th September 2023

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Abstract

Frame of the research: In today's fast-paced business environments, it is key to understand what facilitates alignment between employees and managers on organisational goals for enhanced performance. Drawing from Strategic Human Resource Management (SHRM) and goal alignment literature, this study aims to fill a gap in the existing literature by exploring the nuanced roles of employee seniority and identification with the leader in shaping normative goal alignment.

Purpose of the paper: This study investigates the role of employee seniority and leader identification in shaping normative goal alignment, thus contributing to the existing literature and offering practical implications to enhance normative goal alignment within organisations.

Methodology: Data are collected from 719 white-collar staff and 313 managers in 20 manufacturing firms. A survey is designed for measuring normative goal alignment, employee seniority, and leader identification. Hypotheses are tested through regression analysis.

Findings: The study finds a negative relationship between employee seniority and normative goal alignment. However, leader identification positively moderates this relationship, suggesting that employees who identify strongly with their leaders are more likely to be aligned with managers on normative goals, regardless of seniority.

Research limits: The research is limited by its focus on Northeast Italy's manufacturing industry and its cross-sectional design. Future studies could explore normative goal alignment in different contexts and employ longitudinal research designs.

Practical implications: The results highlight the importance of employee seniority and leader identification in shaping normative goal alignment. Organisations should be aware of these factors and take steps to ensure effective alignment, such as investing in leadership development programmes or implementing strategies to encourage alignment between employees of different seniority levels.

Originality of the paper: This study contributes to the goal alignment literature by focusing on employee seniority and leader identification in shaping normative goal alignment between employees and managers.

Keywords: normative goal alignment; goal-framing theory; normative goals; identification with the leader; employee seniority.

1. Introduction

Nowadays, organisations are confronted with unprecedented levels of uncertainty. To maintain their competitive position, firms must respond swiftly to external changes while continuously adapting their internal structures and processes (Barney and Wright 1998; Noe *et al.*, 2006). One aspect for achieving this aim lies in fostering alignment between employees and the organisation's strategic goals, particularly normative goals, which play a crucial role in a variety of organisational outcomes (Delery and Roumpi 2017; Foss and Lindenberg 2013).

In this view, when individuals within organisations share the same goals, they are more likely to be motivated and committed and to perform better (Kaplan and Norton 2006). The alignment employees with an organisation's strategic objectives occupies a prominent position in the field of strategic human resource management (SHRM), which posits that organisations can generate strategic capability by ensuring that they have skilled and committed employees working towards common goals (Armstrong 2006). However, while the significance of goal alignment is well established, the factors that influence normative goal alignment between employees and their managers remain less investigated.

One factor to consider in this context is the role of employee seniority. While it might be expected that more senior employees would be more aligned with the corporate strategy due to their greater experience and sense of duty (Martin and Schmidt 2010), this relationship is not as straightforward as it may appear. Indeed, increased seniority may not always lead to stronger alignment; it could also result in distancing from organisational goals due to complacency or a sense of entitlement.

The goal of this study is to examine the relationship between employee seniority and normative goal alignment between employees and their managers, building on previous research that has investigated the impact of employee identification with the leader (Kark *et al.*, 2003; Kelman 1958; Pratt 1998; van Knippenberg *et al.*, 2004). Clarifying the role of employee seniority in this context can provide insights for organisations, enabling them to take steps to facilitate goal alignment and, consequently, improve their organisational outcomes. Thus, the primary research objective of this study is to answer the following research question:

RQ: How does employee seniority affect normative goal alignment between employees and their managers?

To address this question, we adopt goal-framing theory (Lindenberg and Foss 2011) as theoretical lens to examine the relationship between employee seniority and normative goal alignment. Goal-framing theory posits that individuals prioritise goals within a hierarchy, with higher-order goals guiding lower-order ones. This framework allows us to argue that seniority may negatively impact normative goal alignment, as more senior employees might prioritise gain and hedonic goals or departmental objectives over organisational goals.

Moreover, we draw upon the literature on identification with leaders (Kark *et al.*, 2003; Kelman 1958; Pratt 1998; van Knippenberg *et al.*, 2004) to argue that the negative effect of seniority on normative goal alignment can be mitigated by the level of identification that employees have with their leader. When employees recognise themselves in their leader, they are more likely to align with the organisation's normative goals and remain committed to their achievement, counteracting the potential distancing effect of seniority. By integrating goal-framing theory and leader identification, we provide a novel perspective on how employee seniority and identification with leaders jointly influence normative goal alignment in organisations.

To test our hypotheses, we collect data from a sample of employees and managers in the manufacturing industry in Northeast Italy. This setting provides a unique opportunity to explore the relationship between employee seniority and normative goal alignment, given the industry's hierarchical structure and the importance of clear goals for performance.

We employ a cross-sectional research design using survey data to capture the perspectives of both employees and their managers. Our analysis included an independent variable-employee seniority, as measured by years of experience in the organisation-and a moderator-identification with the leader. By examining the combined relationship, we arrive at a more nuanced understanding of the role of seniority in shaping normative goal alignment.

Our results reveal that employee seniority negatively impacts normative goal alignment, indicating that increased seniority might lead to distancing from organisational goals. However, our results also demonstrate that identification with the leader can mitigate this negative relationship, suggesting that a strong connection between employees and their managers can weaken the negative effects of seniority on goal alignment. These insights contribute to the ongoing theoretical debate on goal alignment and provide practical implications for organisations seeking to enhance the alignment of their employees' goals with those of their managers.

Drawing from our analysis, organisations can increase their awareness of the impact of employee seniority on goal alignment and thus attempt to take appropriate steps to ensure effective alignment. This may involve fostering a strong sense of identification with the leader, particularly among senior employees, as a means to counteract the negative effects of seniority on goal alignment. By doing so, organisations can enhance normative goal alignment and ultimately improve their performance and overall effectiveness. Thus, this study contributes to the understanding of the role of employee seniority in shaping normative goal alignment between employees and their managers and highlights the importance of considering both seniority and identification with the leader in promoting effective goal alignment practices. As organisations continue to face the challenges of an increasingly competitive and dynamic business environment, fostering strong normative goal alignment between employees and their managers will remain a relevant factor in supporting a variety of organisational outcomes.

2. Theoretical background and hypotheses development

2.1 Strategic human resource management

Strategic human resource management plays a key role in an organisation's ability to achieve its objectives by aligning HR practices with business strategy and promoting a cohesive, integrated approach to managing human resources (Miles and Snow 1978, 1984). SHRM ensures that the organisation's human capital is aligned with the business strategy and leveraged to gain a competitive advantage (Miles and Snow 1984; Schuler 1992; Tyson 1997; Wright and McMahan 1992).

Since its conception, the field of SHRM has been in continuous expansion. This is mainly due to the increasing recognition within strategic management of the capabilities (knowledge first and foremost) and commitment of employees in enabling a firm to achieve a competitive advantage (Barney and Wright 1998). The central purpose of SHRM consists of creating internally consistent practices and routines, building consensus, and fostering a positive work environment that promotes employee engagement and commitment. Therefore, it is expected that highly engaged and committed employees provide support for the achievement of strategic and organisational goals (Huselid *et al.*, 1997).

In this view, Backer (1999) stated that SHRM requires a comprehensive approach in which personnel systems (recruitment, selection, rewards, appraisal, and performance management) are integrated internally and aligned with the organisation's overall strategy. Wright and McMahan (1992) described SHRM as 'the pattern of planned human resource deployments and activities intended to enable an organization to achieve its goals' (p. 298), reinforcing the notion that SHRM plays an essential role in the overall strategic management process.

Strategic human resource management has a vertical and a horizontal dimension. The horizontal dimension refers to connecting practices and routines across different HR functions (Werbel and De Marie 2005), as might happen for firms belonging to the same group, while the vertical dimension refers to linking human resource management human resource management features to corporate strategy. In this study, we focused on the alignment occurring at the vertical dimension. Vertical alignment is key for establishing congruence between business strategy and human resource strategy.

To ensure vertical alignment, individuals are involved in the definition of the team's goals, which are set to support achieving corporate goals (Armstrong 2006). Such an approach encourages employee involvement in the strategic process, fostering a sense of ownership and motivation to contribute to the organisation's success. From this standpoint, goals should be agreed upon through open dialogue between managers and individuals, fostering a work environment with shared responsibilities and mutual expectations (Armstrong 2006). Such an environment could strengthen the alignment between individual and organisational goals also promoting a culture of trust and open communication, which is relevant for long-term organisational success.

By actively participating in the strategic planning process, HR professionals can ensure that HR strategies are designed to support and enhance the organisation's overall objectives. This proactive approach allows HR to anticipate future workforce needs and develop strategies to attract, retain, and develop the talent required for success (Werbel and De Marie 2005).

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2.2 Strategic goal alignment

Prior research has discussed the importance of aligning employees' skills, abilities, and competencies for organisation's strategies (Barney and Wright 1998; Boswell, 2006; Noe *et al.*, 2006). Studies have explored how employees contribute to organisational strategy, focusing on employee skills and personal traits (Raffiee and Coff 2016) or human resource management practices (Collins and Clark 2003; Delery and Roumpi 2017). Boswell (2006) underscored the role of employees' awareness and involvement in corporate strategy. In particular, the author conceptualised the importance of the '*line of sight*' to the strategic objectives' as 'an employee understanding the strategic objectives of an organization and how to contribute to those objectives' (ibidem: p. 1491).

We build the conceptualisation of 'strategic alignment' on Boswell's (2006) 'line of sight' concept. Furthermore, as argued in the literature, when dealing with individuals within organisations, it is crucial to consider the heterogeneity among different hierarchical levels. In *Organizations* and subsequent works, March and Simon (1993) explicitly acknowledged the heterogeneity of individuals' perceptions and goals, which can lead to internal conflicts and challenges in strategic alignment and coordination. This internal heterogeneity includes the perceptual differences across individuals within the same organisation (Gibson *et al.*, 2009; Shamir 1995), arising partly from the formal positions and roles assigned to them and partly from the implementation of these roles (March and Simon 1993). Grounded in perceptual theory, scholars have investigated the perceptual distance across individuals (e.g. Allport 1955). In this paper, we focus on the perceptual differences that exist from one hierarchical level to another.

Regarding hierarchical levels, Gibson *et al.*, (2019) developed a new perspective on the nature of heterogeneity within organisations and posited that individuals within organisations have dissimilar perceptions and goals at different hierarchical levels. They examined the nature of these differences across various levels of the organisational hierarchy. Specifically, scholars observed the existence of a 'hierarchical erosion effect,' whereby the lower one's position in the organisational hierarchy, the less favourable one's perceptions of certain practices and goals become (Gibson *et al.*, 2019, p. 6).

The notion that individuals at different levels within the organisation perceive things differently was first contended by March and Simon (1993) and confirmed in later works (e.g. Cole and Bruch 2006; Gibson *et al.*, 2019). The hierarchical erosion effect is closely related to individual identification (Horton *et al.*, 2014). Individual identification varies across hierarchical levels, with senior managers identifying strongly with the organisation

and frontline employees identifying with their narrow work units, thus losing sight of the organisation's strategic mission. Furthermore, the effect of hierarchical erosion is influenced by access to strategic information, which affects identification and employees' perceptions. Specifically, when employees have less access to strategic information, identification might be low and hierarchical erosion might be high. Consequently, employees might lack an understanding of the organisation's goals and priorities (Gibson *et al.*, 2019; March and Simon 1993). Considering these differences in strategic objective alignment among the different levels of the organisational hierarchy, Weiser *et al.*, (2020) called for future studies to examine the continuous interplay of conceptualising and enacting strategies at multiple hierarchical levels.

Thus, we focus on multiple hierarchical levels, assuming that the perception of strategic goals tends to decrease at lower levels of the hierarchy, which likely affects employees' alignment with strategic goals. Given the importance of strategic goal alignment to a firm's success and the hierarchical erosion effect, we turn our attention to strategic alignment between employees and managers. We argue that to ensure such alignment, all staff within a firm must share the same strategic goals (primarily those of the firm).

Alignment between managers and employees with the organisation's strategic goals is of considerable importance, as it reflects the level of alignment of the organisation's staff with the organisation's strategy (Biggs *et al.*, 2014; Boswell 2006; Boudreau and Ramstad 2003). Managers play different roles than subordinates because of their hierarchical positions in an organisation. Therefore, differences in hierarchical levels and the associated differences in authority and power lead to differences in perceptions between managers and subordinates (London and Smither 1995). These differences are also evident in the perception of the organisation's strategy.

Both managers and employees can play a role in facilitating the attainment of a firm's strategic goals. However, according to strategic alignment theory, employees and managers must be aware of the strategic priorities of the organisation, consider them important, and understand how their job contributes to achieving these priorities (Biggs *et al.*, 2014). Alignment with an organisation's strategic objectives might encourage a feeling of 'fit' with the organisation, improving the managers' and employees' sense of awareness of the organisation's direction and goals (Boswell 2006).

2.3 Goal-framing theory: aligning to normative goals

Individuals within organisations often pursue distinct goals, which can be classified into three types, as proposed by Lindenberg and Foss (2011): hedonic, gain, and normative. A goal frame signifies a dominant overarching goal within an individual. Normative goals correspond to the firm's strategic, organisational, and market objectives (Foss and Lindenberg 2013). Conversely, gain and hedonic goals are more individual-oriented, with the former focusing on personal and professional growth and the

latter revolving around well-being, encompassing the attainment of a healthy work-life balance and a satisfactory salary in return for a 'decent' job (Lindenberg and Foss 2011). The goals of managers significantly influence those of employees (Foss and Lindenberg 2013), prompting this study to investigate the goal alignment between these two roles and its implications for organisational performance and competitive advantage. Understanding the dynamics of goal alignment is essential for organisations striving to achieve a competitive edge. By examining the interplay between individual and organisational goals, as well as the factors that contribute to their alignment or misalignment, this study provides insights into the complex relationships that underpin organisational performance and success. The persistence of the three goal types could vary among individuals.

According to goal frame theory, normative goals tend to be characterised by the highest level of precariousness (e.g. Foss and Lindenberg 2013; Lindenberg 2003; Lindenberg and Foss 2011). Foss and Lindenberg (2012) contended that the normative goal frame is inherently precarious, which aligns with an evolutionary perspective wherein the group exists for the individual's adaptive advantage rather than the reverse. This precarious nature of normative goals has significant implications for organisational dynamics, as individuals may prioritise their gain and hedonic goals over organisational objectives, leading to potential misalignment and reduced effectiveness in achieving strategic targets (Foss and Lindenberg 2013). In this perspective, individuals may tend to identify weakly with organisational goals (Foss and Lindenberg 2012). Indeed, normative goals are subject to varying salience, and their precarious nature can weaken or even switch entirely (Lindenberg 2003). The authors emphasised that recognising the critical role of the normative goal frame and its uncertainty may be 'the most important ingredient' for understanding organisations based on goal frame theory (Foss and Lindenberg 2012). A decline in the willingness to pursue normative goals could explain potential backdrops in organisational outcomes, as suggested by Foss and Lindberg (2013). Indeed, since employees are the means by which organisational goals are achieved, they must be aligned with normative organisational goals to contribute effectively to realising these objectives (Boswell 2006).

Gain and hedonic goals might be prioritised by several individuals as they address basic human needs. Drawing upon Maslow's hierarchy of needs, hedonic goals concern safety and love/belonging, while gain goals involve esteem and self-actualisation. Conversely, normative goals represent the perspective of a 'supra-individual entity': the firm and what benefits it (Foss and Lindenberg 2013, p. 95). Fostering an organisational culture that encourages an increasing alignment between personal and organisational goals is key to promoting higher levels of motivation, commitment, and satisfaction among employees (Locke and Latham 2002). Thus, while normative goals often pertain organisational outcomes, the impact of gain or hedonic goals is more tightly related to the individual sphere. Moreover, such goals have been demonstrated to mediate the relationship between assigned goals and individual performance: individuals setting specific, challenging goals perform better (Locke and Latham 1990).

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To maintain a balance among different goals and possibly ensure goal alignment within individuals, organisations should develop mechanisms that encourage employees to adopt normative goals while simultaneously respecting their individual needs and aspirations. This may include transparent communication of organisational objectives, provision of opportunities for professional development, and the establishment of a supportive and inclusive work environment that promotes both personal well-being and commitment to the organisation's mission (Kaplan and Norton 2006). Additionally, the role of leadership in shaping and sustaining goal alignment cannot be understated. Transformational leaders can inspire employees to adopt organisational goals by articulating a clear vision, demonstrating a commitment to organisational values, and fostering a sense of collective identity (Bass 1999). By effectively aligning individual goals with organisational objectives, organisations can harness the full potential of their human capital, ultimately enhancing their competitive position in the market.

2.4 The precariousness of normative goals

Normative goals, representing the strategic, organisational, and market objectives of a firm, offer a unifying framework that directs employee behaviour and decision-making processes towards achieving shared objectives. Employees aligned with normative goals are more likely to engage in actions and behaviours that contribute to the organisation's overall success, fostering unity and purpose within the workforce. Moreover, alignment with normative goals promotes a culture of accountability and commitment to the organisation's mission. Employees who comprehend and internalise normative goals are more inclined to assume responsibility for their actions and exhibit a higher commitment to attaining organisational objectives. In turn, this can lead to increased employee satisfaction, motivation, and retention, as individuals perceive their work as meaningful and valuable within the broader organisational context.

Nevertheless, the hierarchical erosion effect (Gibson *et al.*, 2019) posits that knowledge of and alignment with organisational goals tend to decrease at lower levels of the hierarchy, potentially affecting strategic goal alignment due to the misalignment between employees' normative and strategic goals. These assumptions are consonant with Gavetti *et al.*'s (2007) assertion that an organisation is a 'coalition of heterogeneous participants with conflicting interests, goals, and knowledge' (p. 527).

Considering the precarious nature of normative goals and the hierarchical erosion effect, we argue that managers and employees achieve the highest level of alignment with normative goals, particularly in the short term, when employees' seniority is low. Conversely, in the medium to long term, when employees hold the same work position for several years, this alignment may wane, primarily because employees (or individuals in lower hierarchical positions) modify their priorities, emphasising personal growth and well-being over organisational objectives.

Existing evidence indicates that increasing tenure in a work position might diminish an employee's alignment with the organisation's strategic goals (Boswell 2006).

During their tenure, employees experience various organisational changes, often occurring without clear guidance or direction (e.g. Choi 2011). In this rapidly changing context, senior employees who have developed routines and practices over time may resist adopting new normative goals, particularly if these goals challenge their established work methods, resulting in a deterioration in alignment with normative goals (Boswell 2006). Senior employees may prioritise gain and hedonic goals that maintain the status quo or minimise risks to preserve their career stability, even if these objectives deviate from normative goals (e.g. Peeters *et al.*, 2022). Such resistance could create a mismatch between managers' and employees' goals, hindering the achievement of organisational goals and competitive advantage.

Building on employee commitment literature, prior research suggests that seniority negatively affects commitment; younger employees demonstrate higher commitment levels than their senior counterparts (e.g. Hong *et al.*, 2016). Given that employee commitment could enhance the employee alignment with organisational strategic goals (e.g. Meyer and Maltin 2010), seniority can adversely impact strategic goal alignment between managers and employees. Thus, based on the aforementioned arguments, we hypothesise the following:

Hypothesis 1. *Employee seniority is negatively related to normative goal alignment between managers and employees.*

2.5 The moderating role of identification with the leader

Identification is a process through which an individual perceives another entity (individual, group, or object) as an authority over themselves (Pratt 1998). Identification, as a perceptual or cognitive construct (Meal and Ashforth 1992), may occur when an individual accepts influence to establish or maintain a satisfying, self-defining relationship with another person or group (Kelman 1958). The construct of identification emerged early in the development of organisational science (Ashforth *et al.*, 2008).

Over the years, literature has primarily focused on organisational identification, referring to an individual's identification with a firm's core values and culture (e.g. Meal and Ashfort 1992; Pratt 1998; van Knippenberg and van Schie 2000). In organisational behaviour, the most commonly studied identification target is the collective, primarily an organisation, and, secondarily, an occupation or team (e.g. Ashforth *et al.*, 2008). In contrast, personal identification, as defined by Ashforth *et al.*, (2016), refers to perceived oneness with another individual, wherein one defines oneself in relation to the other.

Scholars have recognised the leader of a business unit (BU), department, or function as a key target of individuals' identification processes (Kark *et al.*, 2003). According to Hobman *et al.*, (2011), personal identification with the leader is 'a self-categorization process that involves an individual

defining him or herself in terms of the attributes of the leader, shifting their focus on individual gains for the leader, and experiencing a high level of connection with the leader' (p. 556).

Identification with the leader encourages followers to be loyal to the leader, perceiving the leader's interests as their own (Van Knippenberg *et al.*, 2004), thus facilitating strategic goal alignment between managers and employees. Consequently, followers perceive their leader as part of their self-concept, creating a stronger psychological connection with both the leader and the whole organisation (Bunjak *et al.*, 2019).

Although numerous studies have explored personal identification with the leader and its impact on follower outcomes, researchers have disagreed on whether this phenomenon is beneficial or detrimental (Ashforth *et al.*, 2016). Some studies have reported positive outcomes, such as increased job satisfaction, job performance, commitment, and career development, as well as lower turnover intention (e.g. Hobman *et al.*, 2011; Zhu *et al.*, 2013).

In contrast, other studies have associated identification with unethical behaviour, noting that under unethical leaders, followers may engage in unethical actions and hinder ethical behaviour in others (e.g. Brown and Treviño 2009; Gino and Galinsky 2012; Kark *et al.*, 2003).

In this paper, we posit that identification with the leader can positively impact the relationship between employee seniority and normative goal alignment. According to the goal-framing perspective, the stability of the normative goal frame may be significantly influenced by 'contagion effects', both positively and negatively (Lindenberg and Foss 2011). Specifically, we argue that higher levels of identification with the leader can positively moderate the detrimental effects of employee seniority.

If identification with the leader is strong, the negative impact of seniority on normative alignment between employees and managers is mitigated by the positive outcomes associated with a close relationship with the manager, such as reciprocal trust and psychosocial support, career development, loyalty, and shared values and goals (e.g. Ashforth *et al.*, 2016; Bouquillon *et al.*, 2005).

When the identification with the leader is high, senior employees exhibit greater organisational commitment. Such senior employees share values and beliefs with their leader. This alignment makes followers feel that they contribute to the organisation's success (Zhu *et al.*, 2013). These outcomes, in turn, reinforce the normative goal alignment between employees and managers (e.g. Bunjak *et al.*, 2019; Kark *et al.*, 2003; Wang and Rode 2010).

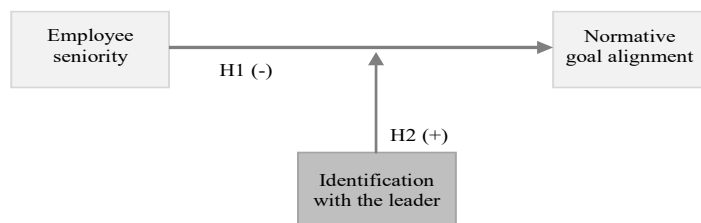
Conversely, weaker identification with the leader exacerbates the negative relationship between employee seniority and goal alignment. When identification with the leader is weak, the effects of employee seniority are amplified by a lack of trust in the leader, a lack of organisational commitment, and a lack of shared values, resulting in diminished normative goal alignment (e.g. Ashforth *et al.*, 2016; Kark *et al.*, 2003; Zhu *et al.*, 2013). Based on these arguments, we hypothesise the following:

Hypothesis 2. *Identification with the leader weakens the relationship between employee seniority and normative goal alignment between managers and employees. Thus, the greater the identification with the leader, the less negative the relationship.*

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Figure 1 summarises our research model.

Fig. 1: Research model



Source: our elaboration

3. Method

3.1 Sample and setting

Data were collected from white-collar staff and managers employed in 20 manufacturing firms located in Northeast Italy. The data collection lasted about one year and was carried out up to December 2021. Our study includes firms from diverse industries, such as food, furniture, machinery, and steel. By selecting a varied range of firms, we were able to avoid the issue of single-source bias that occurs when there is overlapping variability (Groves *et al.*, 2011). We designed a self-administered survey that eliminated potential directional responses. We achieved this by organising the key questions into different sections and avoiding clear references to the model in Figure 1. These measures helped enhance the validity of the study and mitigated biases among the participants, shifting their attention to cause-effect relationships. In Table 1, we report a description of the sample characteristics related to the employees included in the study.

3.2 Measures

3.2.1 Dependent variable

The dependent variable in this study was built using a two-step approach to measure normative goal alignment between employees and their managers. Based on Foss and Lindenberg (2013), as a first step, we developed and administered to all participants a list of six goals, which were randomly assorted and which reflected normative, gain, and hedonic goals. In fact, as Foss and Lindenberg (2013) stated, there are 'three overarching goals. There is the overarching hedonic goal, which expresses the desire to

improve (or preserve) the way one feels right now, related to one's need fulfilment; there is the overarching gain goal, which expresses the desire to improve (or preserve) one's resources; and there is the overarching normative goal, which expresses the desire to act appropriately in the service of a collective entity, such as an organisation or a group' (pp. 87-88). The normative goal items were based on the achievement of the strategic objectives set by the firm or the team, while the gain goal items were focused on personal career opportunities and advancement; the hedonic goal items were based on having a good work-life balance. The list of the proposed goals is presented in Table 2.

Tab. 1: Sample characteristics

| | n | % |
|-------------------------------|-----|--------|
| Gender | | |
| Male | 458 | 63.70% |
| Female | 261 | 36.30% |
| Age | | |
| Under 25 | 11 | 1.53% |
| 25-34 | 136 | 18.92% |
| 35-44 | 210 | 29.21% |
| 45-54 | 269 | 37.41% |
| Over 54 | 74 | 10.29% |
| Unspecified | 19 | 2.64% |
| Education level | | |
| Less than high school diploma | 39 | 5.42% |
| High school diploma | 314 | 43.67% |
| Bachelor's degree | 67 | 9.32% |
| Master's degree or more | 272 | 37.83% |
| Unspecified | 26 | 3.62% |
| Employee seniority | | |
| 2 years or less | 99 | 13.77% |
| 3-5 years | 105 | 14.60% |
| 6-9 years | 82 | 11.40% |
| 10-15 | 184 | 25.59% |
| 16-25 | 166 | 23.09% |
| More than 25 | 83 | 11.54% |
| Business Unit Category | | |
| Administration & Control | 81 | 11.27% |
| Supply Chain | 99 | 13.77% |
| R&D | 80 | 11.13% |
| Production/Engineering | 220 | 30.60% |
| HR | 37 | 5.15% |
| Sales | 176 | 24.48% |

n = 719.

Source: our elaboration

Tab. 2: Normative, gain, and hedonic goals

Normative goals

- Achieving the goals set by my firm.
- Achieving the goals of my work team.

Gain goals

- Having opportunities for career growth and advancement.
- Working in contact with people and having a good relationship with colleagues.

Hedonic goals

- Maintaining a good balance between work and leisure time.
- Having a consistently stimulating job.

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Source: our elaboration

In the second step, the respondents (both managers and employees) were asked to order the goals in descending rank (from the one having their highest priority to the one having their lowest priority) based on their personal priorities. The goal rankings of the employees were then associated with those of their managers, who could be the chiefs of the specific BU, function, or department. If both an employee and their manager indicated a normative goal in the first or second position, a value of 1 was assigned to the normative goal alignment variable, and 0 was assigned otherwise. This method of measuring normative goal alignment was thus based on the subjective priorities of employees and managers. Comparing the rankings of the employees and their managers, we identified cases of alignment or misalignment between the two groups on normative goals.

3.2.2 Independent and moderating variables

To measure employee seniority, we administered a question in the survey in which the employees had to indicate how many years they had been employed by the firm in which they were currently working. This measure allowed us to gather accurate data on the length of service of each employee while also capturing information related to the experience levels of each employee in the firm they were currently operating.

To measure identification with the leader, we adopted a scale originally developed by Mael and Ashfort (1992) on organisational identification and then adapted in various studies to measure identification with the leader (e.g. Kark *et al.*, 2003; Van Quaquebeke *et al.*, 2010). To enhance the validity of the adopted latent scale, we relied on congeneric approaches, utilising the congeneric latent construct (CLC) estimator proposed by Marzi *et al.*, (2023). This approach strengthened the accuracy and reliability of our measurements, ensuring a more robust assessment of the underlying constructs. In Table 3, we report the list of items and reliability coefficients for the adopted latent construct.

Tab. 3: Items and reliability of the latent variable

| | Omega | AVE |
|--|-------|-----|
| Identification with the leader | .82 | .45 |
| 1. When someone criticises my leader, it feels like a personal insult | | |
| 2. When I talk about my leader, I usually say 'we' rather than 'he or she' | | |
| 3. I am very interested in what others think about my leader | | |
| 4. My leader's successes are my successes | | |
| 5. When someone praises my leader, it feels like a personal compliment | | |
| 6. If a story in the media criticised my leader, I would feel embarrassed | | |
| | n=719 | |

Source: our elaboration

3.2.3 Control variables

The first set of control variables consisted of socio-demographic factors, including age, gender, and education. These characteristics represent relevant control variables, as they may be associated with different goals. For example, younger employees may prioritise career advancement more highly than older employees, who may prioritise work-life balance or normative goals. Education level may also be relevant, as more highly educated employees may be more likely to prioritise normative goals related to the organisation's strategic objectives. Including these variables as controls allowed us to examine whether the relationship between normative goal alignment and employee seniority and identification with the leader holds even after accounting for these demographic differences. Another control variable we included is the length of time an employee has been working with their current supervisor. This variable is relevant as an employee who has been working with their supervisor for a longer period of time may be more likely to have established a good working relationship with them, which could influence their goal alignment. Finally, we included BU-level and firm-level variables as controls to examine whether there were any fixed effects related to the specific context in which each employee was operating. For example, employees in certain BUs or at certain levels of the firm may be more likely to prioritise normative goals related to the organisation's strategic objectives, regardless of their seniority or identification with the leader, due to the organisational climate or culture incentivising certain types of goals.

3.3 Statistical method

We used Stata 17, a widely adopted statistical software, to conduct the statistical analysis. In the Results section, we present a correlation table with all the variables included in the regression analysis. Regression analysis was utilised for hypothesis testing, as it is a flexible and versatile tool for examining the relationship between multiple independent variables and one dependent variable. The adoption of regression techniques allowed us to fit our research model while also accounting for the diverse nature of

the variables included in the study. In addition, it aided in controlling for a number of factors and assess the statistical significance of the hypothesised relationships.

The resulting models are presented using incremental logic. First, we present a model that includes only control variables. Next, we added the independent effects incrementally, followed by the interaction effect. This approach enabled us to observe improvements in the R-squared coefficient and to assess the statistical significance of each added effect independently.

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4. Results

In Table 4, we report the correlations among the variables. As shown, among the independent variables, employee seniority (the main independent variable) is correlated with the overall time spent with the supervisor ($\rho = .37, p < .01$), age ($\rho = .49, p < .01$) and education ($\rho = .25, p < .01$). Hence, to check for multicollinearity issues, we computed the variance inflation factors (VIFs), none of which exceeded the recommended thresholds (Chatterjee and Hadi 2006).

Tab. 4: Correlation matrix

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------------------|---------|---------|-------|---------|-------|---------|------|-----|
| 1. Normative goal alignment | - | | | | | | | |
| 2. Time in the firm | -.07** | - | | | | | | |
| 3. Id. with the leader | .15*** | -.02 | - | | | | | |
| 4. Time with supervisor | -.06* | .37*** | -.04 | - | | | | |
| 5. Age | .14*** | .49*** | .07* | .25*** | - | | | |
| 6. Gender | -.08** | .01 | -.06 | .09* | -.09* | - | | |
| 7. Education | -.08** | -.25*** | -.00 | -.04 | -.02 | .06* | - | |
| 8. Firm | -.12*** | -.11*** | -.07* | -.20*** | -.06* | -.11*** | -.04 | - |
| 9. Business unit | .02 | -.02 | .01 | -.01 | .01 | .00 | .07* | .06 |

n = 719.

Source: our elaboration. ***p < .01; **p < .05; *p < .1.

In Table 5, we report the results of the regression analysis. Model 1 concerns the effects of the control variables on the dependent variable. In Model 2, we added the main independent variable (employee seniority), which corresponds to Hypothesis 1. In Model 3, we assessed all the direct effects (including identification with the leader), and in Model 4, we added the interaction effect corresponding to Hypothesis 2.

With respect to the effect of length of time at the firm on normative goal alignment (Hypothesis 1), as shown in Models 2-4, we found a negative and significant relationship (in Model 2, $\beta = -.06, p < .01$). Thus, Hypothesis 1 receives strong empirical support. Turning to the interaction effect, we found a positive and significant moderation of identification with the leader, consistent with Hypothesis 2. Thus, both Hypotheses 1 and 2 are supported.

Tab. 5: Results of regression analysis

| | Hp | Model 1 | Model 2 | Model 3 | Model 4 |
|---|-----------|---------------|---------------|---------------|---------------|
| <i>Independent variables</i> | | | | | |
| Time in the firm | 1 | | -.06*** (.01) | -.05*** (.01) | -.06*** (.01) |
| Identification with the leader | | | | .04*** (.01) | .03*** (.01) |
| <i>Interaction effect</i> | | | | | |
| Time in the firm X Identification with the leader | 2 | | | | .02*** (.01) |
| <i>Control variables</i> | | | | | |
| Gender | | -.04* (.03) | -.04 (.03) | -.03 (.03) | -.03 (.03) |
| Age | | .05*** (.01) | .07*** (.01) | .07*** (.01) | .07*** (.01) |
| Education | | -.02** (.01) | -.04*** (.01) | -.04*** (.01) | -.04*** (.01) |
| Time with supervisor | | -.01*** (.00) | -.01** (.00) | -.00* (.00) | -.01** (.00) |
| Firm | | -.01*** (.00) | -.01*** (.00) | -.01*** (.00) | -.01*** (.00) |
| Business unit | | .01 (.01) | .01 (.01) | .01 (.01) | .00 (.01) |
| | | | | | |
| | R-squared | .06 | .08 | .09 | .10 |
| | n | 719 | 719 | 719 | 719 |

Note: The dependent variable is normative goal alignment. ***p<.01; **p<.05; *p<.1 (standard errors in parentheses).

Source: our elaboration.

Our study is grounded in the assumption that people who work at higher hierarchical levels in a firm tend to be more aligned with normative goals than those at lower hierarchical levels. To support this assumption, we conducted a t-test on two independent subgroups (namely, 719 employees and 313 managers, as reported in Table 6) and empirically found that managers have almost double the likelihood of prioritising normative goals compared to employees (between the two sample groups, the difference in normative orientation was significant at a p-value = .00; probability_{normative}(employee) = .25; probability_{normative}(manager) = .49).

Furthermore, as shown in Table 6, managers tended to prioritise normative goals and placed hedonic goals at the end of their priority lists. Conversely, employees more often prioritised hedonic goals, while their last priority does not show a clear pattern.

Tab. 6: Goal orientations of employees and managers in the sample

| Employees | n | % | Managers | n | % |
|-------------------|-----|--------|-------------------|-----|--------|
| <i>First goal</i> | | | <i>First goal</i> | | |
| Normative | 183 | 25.4% | Normative | 152 | 48.6% |
| Gain | 212 | 29.5% | Gain | 42 | 13.4% |
| Hedonic | 324 | 45.1% | Hedonic | 119 | 38.0% |
| <i>Last goal</i> | | | <i>Last goal</i> | | |
| Normative | 205 | 28.5% | Normative | 30 | 9.9% |
| Gain | 259 | 36.0% | Gain | 128 | 40.9% |
| Hedonic | 255 | 35.5% | Hedonic | 155 | 49.2% |
| Grand total | 719 | 100.0% | | 313 | 100.0% |

Source: our elaboration

In addition, our sample outlines that in most cases, misalignment is due to shifts from normative goals to gain or hedonic goals among employees (the difference between misalignment is significant, with employees misaligning with normative goals more often than managers, p -value = .00). These results support the underlying theoretical assumption that managers are more inclined towards normative goals.

As far as it concerns control variables, employee gender was not found to be a significant factor affecting goal alignment, and time spent with the supervisor lost its statistical significance when considering our main variable (employee seniority). Interestingly, employee age was positively associated with normative goal alignment, while education was negatively associated with normative goal alignment. Concerning these aspects, we carried out an additional exploration and found that while considering a normative employee orientation (1 if the employee indicated a normative goal as their top priority, 0 otherwise), the analysis of variance produced results consistent with Table 5. In fact, normative orientation was positively influenced by age and negatively influenced by education. More specifically, among the different age classes ($p = .00$) and education levels ($p = .04$), the difference was significant and in the same direction as predicted by our models (see Table 5).

5. Discussion

This study contributes to the extant literature in multiple ways and provides insights for both researchers and practitioners interested in understanding the dynamics of goal alignment within organisations.

First, our study extends previous research on goal alignment by focusing on the role of employee seniority in the relationship between normative goal alignment and organisational effectiveness. While prior studies have examined the impact of goal alignment on various organisational outcomes (e.g. Kaplan and Norton 2006), our study is among the first to explore how employee seniority may influence normative goal alignment. The negative relationship between employee seniority and normative goal alignment found in our study suggests that more experienced employees may be less aligned with their managers' normative goals, which could potentially lead to reduced organisational effectiveness. This highlights the importance of considering employees' career stages when developing strategies to improve goal alignment within organisations.

Second, our study contributes to the literature on the role of identification with the leader in goal alignment (e.g. Kark *et al.*, 2003; Van Quaquebeke *et al.*, 2010). By examining the moderating role of identification with the leader in the relationship between employee seniority and normative goal alignment, our study sheds new light on the importance of leadership in fostering goal alignment within organisations. Our analysis suggests that when employees identify more strongly with their leaders, the negative effect of seniority on normative goal alignment is reduced. This insight can help organisations develop strategies for fostering strong identification with leaders through effective communication, support, and authentic leadership.

Third, our study integrates and builds on the work of Foss and Lindenberg (2013), who proposed a framework for understanding the interplay between normative, gain, and hedonic goals within organisations. By empirically testing the relationship between employee seniority, identification with the leader, and normative goal alignment, our study provides valuable empirical support for the theoretical framework proposed by Foss and Lindenberg (2013) and highlights the importance of considering the different types of goals that may influence employee behaviour and organisational outcomes.

5.1 Theoretical contributions

Our study offers theoretical contributions, advancing the existing body of knowledge in the fields of strategic management, organisational behaviour, and leadership. In examining the role of employee seniority and identification with the leader, our focus on normative goal alignment contributes to the literature on goal alignment, which has primarily centred on the alignment of individual and organisational goals (e.g. Locke and Latham 2002).

By revealing the negative relationship between employee seniority and normative goal alignment, our results highlight the importance of considering employee seniority in the study of goal alignment and organisational effectiveness. This insight adds a previously unexplored aspect of goal alignment to the literature, encouraging researchers to delve deeper into the role of the career stage in organisational goal dynamics.

Additionally, our study expands the literature on the influence of leadership on goal alignment (e.g. Kark *et al.*, 2003; Van Quaquebeke *et al.*, 2010) by examining the moderating role of identification with the leader in the relationship between employee seniority and normative goal alignment. This underscores the importance of fostering strong identification with leaders, thus providing a valuable theoretical contribution to the understanding of leadership and goal alignment.

Furthermore, by building on and providing empirical evidence for the theoretical framework proposed by Foss and Lindenberg (2013), who suggested that employees' behaviours within organisations can be driven by normative, gain, and hedonic goals, our study validates key aspects of this framework, encouraging further research in this area.

5.2 Practical implications

Our study has three main practical implications. First, given the observed negative relationship between employee seniority and normative goal alignment, organisations should be aware of the potential for goal misalignment as employees advance in their careers. To address this issue, organisations could implement initiatives aimed at reinforcing the importance of normative goals among senior employees. For example, organisations could provide training programmes, workshops, or targeted communications emphasising the significance of normative goals and their connection to organisational success.

Second, our study highlights the critical role of identification with the leader in moderating the relationship between employee seniority and normative goal alignment. Consequently, organisations should strive to foster strong leader-follower relationships. This can be achieved by investing in leadership development programmes that emphasise the importance of interpersonal skills, empathy, and trust-building. Furthermore, organisations could create opportunities for leaders to interact more closely with their subordinates, such as through team-building activities or regular one-on-one meetings. By cultivating strong connections between employees and leaders, organisations can facilitate better goal alignment and improve overall performance.

Third, the validation of Foss and Lindenberg's (2013) theoretical framework on normative, gain, and hedonic goals provides organisations with a useful lens through which to understand and manage employee motivation. Recognising that employees are driven by these different goals, organisations can develop tailored incentives and initiatives to appeal to the diverse motivational drivers of their workforce. By doing so, organisations can more effectively encourage goal alignment and create an environment in which employees can thrive and contribute to the organisation's success.

5.3 Future research avenues

This study offers various avenues for future research. One potential direction for future research includes exploring the impact of other factors on normative goal alignment. Although our study focused on employee seniority and identification with the leader, there could be other factors that affect normative goal alignment. Researchers may consider examining the role of organisational culture, communication styles, and various individual differences, such as personality traits or values.

Another avenue for future research could be to investigate the effect of normative goal alignment on a wider range of organisational outcomes, such as employee performance, job satisfaction, and turnover intentions. This would provide a more comprehensive understanding of the consequences of normative goal alignment within organisations. Additionally, future research could expand the context of this study by examining normative goal alignment in different industries, countries, and cultures. By doing so, researchers can determine whether the relationships observed in this study are generalisable across various settings or are specific to the context of the manufacturing industry in Northeast Italy.

Furthermore, longitudinal studies could provide insights into the dynamic nature of normative goal alignment and its impact on organisational outcomes over time. Longitudinal designs would enable researchers to examine how changes in employee seniority, leadership, and other factors may affect goal alignment and its consequences. Finally, future research could explore the potential role of technology in facilitating or hindering normative goal alignment. As organisations increasingly adopt digital tools and platforms to support communication and collaboration, it would be valuable to examine how such technologies may influence the alignment of goals between employees and their managers.

6. Conclusion and limitations

This study has provided insights into the role of employee seniority and identification with the leader in shaping normative goal alignment between employees and their managers. Our results contribute to the existing literature by demonstrating the importance of these factors in enhancing normative goal alignment, which, in turn, can lead to better organisational outcomes. The results also highlight practical implications for organisations, emphasising the need for managers to be aware of the impact of employee seniority and identification with the leader on goal alignment and to take appropriate steps to ensure effective alignment.

However, our study is not without its limitations. First, the research was conducted within the specific context of the manufacturing industry in Northeast Italy. This may limit the generalisability of our results to other industries, countries, and cultures. Future research could address this limitation by exploring normative goal alignment in different contexts.

Second, the cross-sectional design of our study does not allow for causal inferences or an examination of the dynamic nature of goal alignment. Longitudinal research designs would be more suitable for investigating the causal relationships between variables and changes in normative goal alignment over time.

Lastly, our study focused on employee seniority and identification with the leader as key factors influencing normative goal alignment. Future research could consider incorporating additional factors to provide a more detailed understanding of the determinants of normative goal alignment in organisations.

Despite these limitations, we hope this study could constitute a step forward in understanding the dynamics behind normative goal alignment by providing additional evidence on the interplay between different goals and different hierarchical levels inside organisations.

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The environmental performance of B Corp SMEs and the occurrence of greenwashing

Received
6th April 2023

Revised
15th May 2023

Accepted
21st September 2023

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Abstract

Frame of the research: *The paper focuses on the B Corp certification and on greenwashing.*

Purpose of the paper: *The study explores whether environmental performance is less of a priority than social performance in obtaining the B Corp certification, and whether greenwashing is still possible within certified SMEs.*

Methodology: *The paper is based on a quantitative analysis of 134 UK SME B Corp scores, and on a content analysis of company reports from a sample of 10 companies.*

Results: *The analysis demonstrates a range of issues within the B Corp certification. For example, findings support the evidence that the environmental impact in certain scenarios can be ignored, while still obtaining certification. This is because companies perform well under other impact areas, which are more related to social aspects. The results also suggest that greenwashing can still occur within a certified company.*

Research limitations: *The study did not investigate specific types of green claims in relation to the Environment B Corp score. Moreover, the paper focused on one voluntary certification type, and thus the findings only apply to the B Corp scheme.*

Practical implications: *By highlighting the weaknesses of the B Corp certification, which enables companies to obtain the certification even with a low environmental performance, SMEs could consider alternative voluntary certifications that align more with their values, and which also consider social and environmental performance equally. Our paper can support companies in assessing their own communications to reduce greenwashing before releasing information to key stakeholders.*

Originality of the study: *The paper is one of the few studies exploring greenwashing in the case of B Corp certification. It contributes to the environmental management literature, specifically on the symbolism of corporate environmental strategies.*

Key words: B Corp; greenwashing; environmental performance; SME, green claims

1. Introduction

With the climate crisis intensifying, there is ever-increasing scrutiny of business practices regarding environmental performance and responsibilities (Bowen, 2014a), which means that Corporate Social Responsibility (CSR) is being embraced at unprecedented levels. This can be seen through a shift in business strategy towards initiatives focused on a range on social and environmental issues that are important to specific stakeholder groups (Pekovic and Vogt, 2021).

These proactive responses to stakeholders can be expressed in a variety of ways, for example, through the self-reporting of specific environmental and social issues in sustainability reports, which also influence economic and social areas. Another approach is through voluntary certificates, which are obtained when specific criteria in the environmental and social performance of a business have been met.

An example of voluntary certification is the B Corp, which requires certain environmental and social criteria to be achieved to an exceptional standard (Burger-Helmchen and Siegel, 2020). B Corp certification is growing in popularity, and in August 2022, when our study was being carried out, there were 1,156 certificated companies in the UK (B Lab, 2022b).

Such increasing awareness and transparency in the field of CSR, should be celebrated as a mark of progress towards sustainable development in business. However, greenwashing represents a longstanding barrier to further advancements. Through greenwashing, companies “may seek to gain advantage from the legitimacy associated with disclosing CSR information, while putting in minimal effort to address CSR issues” (Wang *et al.*, 2018, p. 68). In these cases, many businesses, either through their own self-reporting or certifications, exaggerate their attempts to improve environmental performance, or unsubstantiated claims of being environmentally responsible. This has a knock-on effect on the legitimacy of businesses that make accurate and transparent claims, with further scrutiny falling upon them as a consequence. It is therefore vital that company reporting, and certifications linked with positive environmental performance are not susceptible to greenwashing.

This paper thus investigates the assessment process behind a specific voluntary certificate, B Corp, and whether SMEs in the UK, are still guilty of greenwashing in their reports despite this status. The occurrence of greenwashing is explored using a new identification framework. The findings are aimed at clarifying whether B Corp is appropriately awarded to SMEs, or whether greenwashing can still occur within the SME reports.

2. Literature Review

2.1 Sustainability strategies, Third-Party Disclosures, and B Corp certification: an institutional perspective

The increasing interest in Corporate Social Responsibility (CSR) in business has primarily occurred due to pressures from a range of stakeholders (Pekovic and Vogt, 2021; Arrive *et al.*, 2019; Helmig *et al.*, 2016; Perez-Batres *et al.*, 2012). This has driven companies to focus beyond a model of profit to one that measures and improves environmental and social performance (Kraus *et al.*, 2020).

In response to the pressures from CSR and due to new policies, increasing numbers of companies publicly disclose their environmental performance through annual reports. Through the increase in scrutiny from new and broader audiences, these reports have become essential

in creating organisational legitimacy (Castelló and Lozano, 2011; Hooghiemstra, 2000; Neu *et al.*, 1998). Businesses have also realised that reporting environmental metrics such as emissions, can have significant economic impacts (Tang and Demeritt, 2018). In addition, such reporting can show business compliance within environmental standards, therefore preventing expensive penalties or investigations by authorities.

With company reports now focusing beyond the financial aspects of operations, information disclosure has aided the reduction in the quantity of asymmetric information held by a company (Eng *et al.*, 2022). However, with large quantities of data now being shared within annual reports, there has been criticism that the data is hard to compare across different companies, and that instead, disclosure should be standardized so that accurate comparisons of businesses' environmental impact can be made (Wang *et al.*, 2018).

It seems that only companies with high CSR performance scores (Mahoney *et al.*, 2013) or showing considerable environmental performance improvements are likely to disclose a significant range of information, while companies without improvement or even negative impacts generally provide minimal data, or manipulate information released (Zharfpeykan, 2021).

While environmental disclosure through company reports gives legitimacy, brings stakeholders on board, and creates a competitive advantage, in some instances the company is highly selective regarding the information that is disclosed (Bowen, 2014b). This is primarily to protect the image and reputation, which is often demonstrated by disclosing very short-term improvements, while long-term standards have declined. Some of the organizational literature thus argues that firms often tend to reply to institutional requests by showing only symbolic compliance (Meyer and Rowan, 1977), instead of a substantive implementation of strategies, standards, or actions. The aim is to improve companies' legitimacy towards stakeholders and to shift their attention away from critical aspects.

Within the institutional theory, some studies have focused on institutional pressures and firms' environmental strategies. Some have explored how institutional pressures affect the decisions of firms to implement sustainability strategies (Darnall *et al.*, 2010; Zhu *et al.*, 2013; Testa *et al.*, 2018). Others have investigated the institutional constraints regarding corporate environmental reporting (Gallego-Alvarez *et al.*, 2017), or what types of institutional pressures influence the disclosure of sustainable information (Cubilla-Montilla *et al.*, 2020).

The criticisms suggest that businesses are susceptible to accusations of greenwashing, given that their environmental performance can be hidden, or carefully crafted to divert attention away from other potentially more significant environmental issues.

Given the power of disclosure to build positive brand images and influence consumer behaviour, companies are increasingly willing to embrace CSR in the form of a third-party disclosure to gain greater legitimacy and respond to institutional pressures. The study thus focuses on third-party voluntary sustainability certifications awarded to SMEs and compares this to the sustainable performance and self-reporting of

companies. We specifically analyze the case of B Corp certification, which is a voluntary certification used by many SMEs in the UK. The scores awarded are a key source of data in this paper to identify discrepancies between the B Corp environmental scores and a company's own environmental claims. Management studies and research on B Corp are quite recent, and many aspects such as those linked to its performance have not yet been widely explored, (Kirst *et al.*, 2021). B Corp is administered by the not-for-profit organisation, B Lab, which thoroughly assesses the business practices (B Lab, 2022a) of participating businesses. This is done via a B Impact Assessment (BIA), which contains questions on five impact areas (IAs) covering "governance", "workers", "community", "environment", and "customers". If a minimum score of 80 out of 200 is achieved cumulatively from all five IAs, B Lab will verify this and grant certification. While there is limited literature on SMEs and their use of B Corp certification (Carvalho *et al.*, 2022), there appears to be a gap in how B Corp certified SMEs communicate environmental performance and impacts to stakeholders through their reports. This study aims to fill this gap.

There has been positive response to B Corp, with claims of significant success in promoting voluntary compliance (Levy, 2011) through the in-depth assessments, which are in addition, held in high regard by stakeholders (Colamartino, 2022).

However, criticisms within the literature also exist. For example, the minimum score of 80 required has enabled businesses to still obtain certification through high scores in "Governance", "Workers" and "Community" IAs, at the expense of a low environmental score. The study by Nigri *et al.* (2017), for example, also revealed that the highest interest of B Corps is in the areas of "Community" and "Workers". This shows that although certification can be achieved, it does not necessarily reflect positive environmental standards within a business (Liute and De Giacomo, 2022). In this sense, the B Corp standards may reflect only symbolic compliance towards some impact areas. It is therefore reasonable to assume that poor environmental or social scores may be misrepresented by the overarching B Corp certification (Kareiva *et al.*, 2015).

This is even more significant given that a B Corp certification provides a label that can be used on products or websites. The critique implies that B Corp certification is susceptible, in some cases, to "greenwashing".

With the understanding that certification does not always guarantee good environmental practices, B Corp certification may hide symbolic corporate compliance, at least in terms of some sustainability aspects. The existing literature has not extensively explored the extent to which the environmental IA scores within the BIA assessment are less of a priority than the other four IAs. This paper examines the recently certified assessment scores of UK SMEs, in order to help understand if this is a widespread issue.

The first research question is as follows:

RQ 1: Do B Corp environmental scores of SMEs suggest that the environmental impact area is less of a priority than the others to achieve certification?

2.2 Greenwashing

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It has been shown that company disclosures and third-party certificates are both vulnerable to “greenwashing”. This can be defined as, “selective disclosure of positive information about a company’s environmental or social performance, without full disclosure of negative information on these dimensions, so as to create an overly positive corporate image” (Lyon and Maxwell, 2011:9).

However, many other definitions of greenwashing exist (Bowen, 2014a; Terra Choice Environmental Marketing Inc., 2007), as well as specific classifications of greenwashing by different papers. For example, Siano *et al.* (2017) proposed a new type of greenwashing, defined as “deceptive manipulation”, where communication on sustainability manipulates corporate actions to make tangible sustainability statements. Carlson *et al.* (1993) identified different categories of green claims, such as vague/ambitious, omissions, false/outright lies, and combination claims.

Another paper argues that businesses undertake greenwashing for different reasons, from “intentional greenwashing” to “unintentional greenwashing”, where companies are simply not aware that they are doing it (Szabo and Webster, 2021). Many drivers and determinants may explain why companies are engaged in greenwashing (Vollero, 2013), such as institutional, market, organizational, and individual reasons (Delmas and Burbano, 2011).

Due to the complex nature of greenwashing, unsurprisingly, consumer scepticism has grown around the environmental impact of different business operations as well as specific products or services (Bowen, 2014b). It has also become increasingly difficult for stakeholders to identify and have confidence in a genuine green claim (de Freitas Netto *et al.*, 2020), as the increasing number of sustainability claims has motivated stakeholders to question how concrete companies’ efforts are towards sustainable development. It could therefore be argued that the demand for transparency and dynamic communication by stakeholders, could have a significantly positive impact for businesses. Many stakeholders struggle to identify greenwashing and the multitude of greenwashing types. This is undoubtedly further hampered by companies using obfuscating language that is intended to confuse readers when describing negative impacts (Wang *et al.*, 2018).

In response to the lack of a universal definition and the struggle to identify greenwashing behaviour, Nemes *et al.* (2022) developed a greenwashing framework that includes thirteen indicators coupled with questions to help assess potential claims. The framework was included in very recent literature and does not appear to have been largely used thus far.

Many studies have explored corporate greenwashing, and the majority have investigated greenwashing in large companies (Yu *et al.*, 2020; Pimonenko *et al.*, 2020; Ruiz-Blanco *et al.*, 2022). The seminal paper by Ramus and Montiel (2005), for example, found that large companies committed to environmental policies do not always implement these policies, thus arguing that environmental commitment may represent

a form of greenwashing. Arribas *et al.* (2021) found that irresponsible corporate activities do not prevent companies from joining a Sustainability Index. These findings have thus shown that sustainability indexes do not exclude companies with a poor CSR performance, and which could still be identified as sustainable companies. Similarly, some of the literature found that sustainable certifications do not always play a buffer role against greenwashing (Boiral, 2007; Liute and De Giacomo, 2022). These certifications may hide symbolic environmental behavior (Christmann and Taylor, 2006; Heras-Saizarbitoria *et al.*, 2020a; Vilchez, 2017), which is associated with greenwashing (Nardi, 2022; Walker and Wan, 2012).

Based on the above-mentioned literature and on the theoretical view that standards may be merely symbolic (Meyer and Rowan, 1977), similar results could also apply in companies with a B Corp certification, which is a voluntary standard demonstrating that a business meets high social and environmental performance.

As indicated in section 2.1, due to the characteristics of the B Corp standard, the certification can be achieved, although it does not necessarily reflect high positive environmental standards within a business (Liute and De Giacomo, 2022).

The management literature on greenwashing is quite recent, and some studies have focused on companies' environmental reporting and greenwashing, such as Delmas and Burbano, 2011; Lyon and Maxwell, 2011; Lyon and Montgomery, 2015. However, few studies have explored greenwashing in the specific case of the B Corp standard (see, for example, Liute and De Giacomo, 2022). We aim to fill this gap and investigate whether B Corp certificated SMEs show greenwashing behaviours.

RQ 2: Does greenwashing occur within already B- Corp certified SMEs?

To this end, we used Nemes *et al.* framework (2022) to analyse the company reports of B Corp certificated SMEs.

This firstly shows whether the framework can be effectively used to assess greenwashing and if B Corp certificated SMEs show greenwashing behaviours.

3. Methodology

This paper aims to investigate the B Corp scores of SMEs, compared to their disclosures in regard to environmental performance, clarifying whether greenwashing can still occur despite a certification. Research was undertaken in two key stages, both using specifically secondary data, i.e., existing information already publicly available (Clark, 1997). Firstly, a quantitative analysis of UK SME B Corp scores, which received certification between 1st November and 31st December 2021, was used to respond to the first research question. Secondly, a qualitative analysis of published company reports from a sample of certificated companies was undertaken to address the second research question.

The general assumption taken was therefore that an SME has less than 250 employees (UK Government, 2022), and this was applied to the filters within the “B Corp Directory” when searching for certificated companies. In total, 134 UK-based companies were certified by B Lab in November and December 2021. This consisted of businesses across all five sector categories that the B Impact Assessment (BIA) identified. These included, “Manufacturing”, “Wholesale/Retail”, “Services with Minor Environmental Footprint”, “Services with Major Environmental Footprint”, and “Agricultural Growers”. Only the UK was the specific focus of the research, in order to obtain UK-specific trends.

The particular timeframe (from November to December 2021) was chosen to give a representative insight into the type of businesses that were receiving B Corp certification, over a fixed period. Additionally, the current BIA (Version 6), was launched in January 2019 and was used to assess this specific cohort of certificated companies. No overlapping of BIA versions therefore occurred over the time period.

The data were extracted from B Lab’s website, the “B Corp Directory” (B Lab, 2022b), where the impact assessments of all certificated businesses was presented. The “Overall B Impact Score” is shown, alongside the five impact areas (IAs) that constitute the score.

From the companies involved in the quantitative analysis, some were used to undertake a qualitative analysis of their company reports. The content was then analysed using the framework chosen to identify unsubstantiated green claims (Nemes *et al.*, 2022). The sub-sample of ten companies was based on the availability of sustainability information, as very few companies had reports or ones that were published on the business’s website. Instead of detailed reports, there were pages or sections of their websites dedicated to environmental performance or B Corp status. The selection of reports was therefore largely based on the limited resources available. Specifically, out of 134 companies, sustainability information was available for 32. However, of these ten companies were selected, as these were the only ones with completed and detailed reports available. In the other 22 cases, the sustainability information was insufficient to analyze claims. Data saturation was reached with ten reports, as further coding was no longer feasible (Fusch and Ness, 2015; Guest *et al.*, 2006).

The reports available tended to be brief (i.e., under 20 pages), and all were published between 2020 and 2022. Given the size of the sample (reports of ten companies), as well as the brevity of the documents analysed, content analysis was done manually through coding. The aim of this qualitative approach was to reveal whether or not SMEs that obtained B Corp status, were still guilty of greenwashing through the symbolic claims identified in their reports.

The framework (Appendix A) used for the analysis has thirteen types of claims that can be identified, accompanied by claim-specific indicator questions that are used to apply to the specific reports under scrutiny. When analysing company reports, open coding was used to highlight with different colours, the specific types of claims identified (e.g. Selective disclosure, Empty claims, Irrelevant, Misleading Symbols, Jargon). Additionally, it was ensured that claims were not counted twice if the claim

type was repeated within the same section of the report. The final aim was to reveal which types of greenwashing are the most popular and which companies have the largest number of claims.

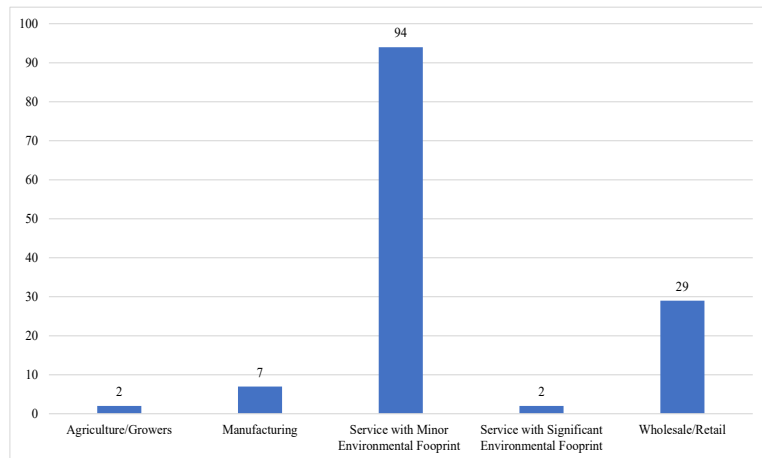
4. Analysis and Results

4.1 B Corp Score Analysis

In total, 134 UK SMEs were awarded B Corp certification during November and December 2021. Figure 1 shows that 70.1% of all the certificated companies were categorised as “Service with Minor Environmental Footprint” (n. 94). This was followed by the “Wholesale/Retail” sector which made up 21.6% (n. 29), with the three remaining sectors constituting the final 8.2% (n. 11). The “Service with Minor Environmental Footprint” sector is one in which a company “earns revenue through the provision of non-physical services” (B Impact Assessment, 2021a). This implies that 70.1% of firms obtaining certification do not have high environmental impacts. This environmental impact area (IA) is thus less of a priority for most of the firms assessed that had achieved certification.

Since the intrinsic nature of B Corp certification implies positive environmental credentials, it is of concern that the majority of businesses assessed are assigned to the sector “Service with Minor Environmental Footprint”. This implies that they cannot find the environmental IA relevant or at all applicable to their operations. Even if the B Corp scoring system assigns to the “Service with Minor Environmental Footprint” sector a lower relevance to the environmental impact area with respect to the other four sectors (Agriculture/Growers, Manufacturing, Service with Significant Environmental Footprint, Wholesale/Retail), it seems that many firms obtain certification regardless of their environmental actions.

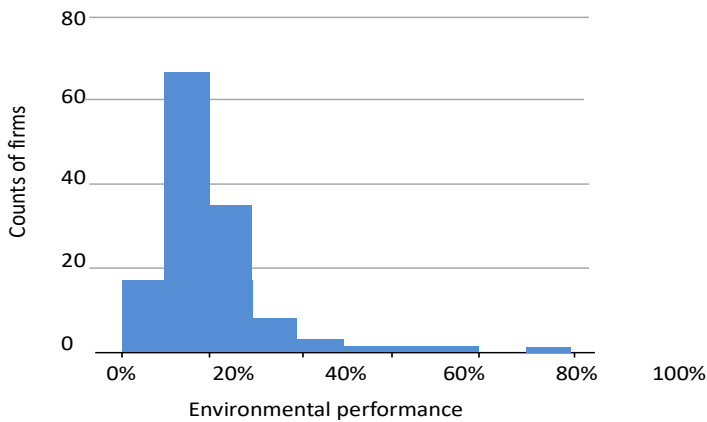
Fig. 1: Number of companies per sector type



Source: our elaboration

To address the first research question, *Do B Corp environmental scores of SMEs suggest that the environmental impact area is less of a priority than the others to achieve certification?*, we identified the relevance that the environmental IA has on the companies' sample, based on the environmental score achieved by certified firms (n. 134). In doing the analysis, we also have taken into account that companies of the "Service with Minor Environmental Footprint" sector have a different distribution of the total points available in the five impact areas, with respect to the other four sectors. We found that three quarters of the companies of the sample obtained the B Corp certification by achieving less than 23% of the environmental impact maximum score in the data (Figure 2).

Fig. 2: Histogram of environmental impact area's distribution across the sample companies



Source: our elaboration

The analysis shows that certificated companies can achieve a low environmental score and still achieve certification. In fact, the B Corp scheme allows companies to decide which impact areas to prioritize and to what extent, to obtain the certification, thus enabling the Environmental impact area not to be a priority for certified companies.

4.2 Greenwashing Analysis of SME Reports - Overview

A qualitative approach was taken to analyse ten company reports from the cohort of companies that had received B Corp certification. This was to identify up to a possible thirteen greenwashing claims using the framework as already outlined in the methodology. From Figure 3, through in-depth coding, six out of the 13 specific types of claims were identified in the

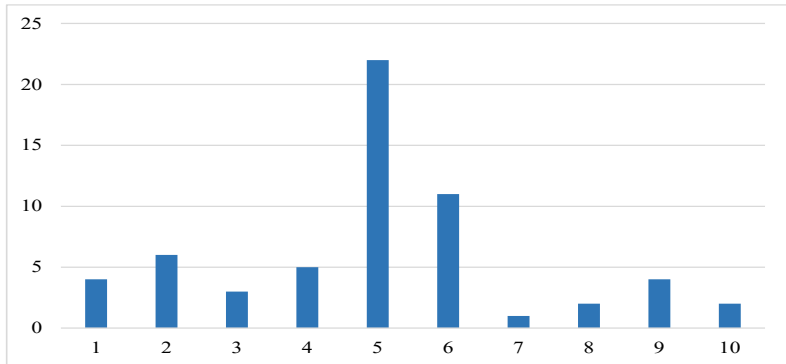
Fig. 3: Identified greenwashing claims by type per business

| Company | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total Claims by Type |
|--|---|---|---|---|----|----|---|---|---|----|----------------------|
| I. Selective Disclosure | | 2 | 2 | 3 | 6 | 2 | 1 | | | | 16 |
| II. Empty Claims | 1 | 2 | | 1 | 3 | 3 | 1 | | 2 | 1 | 14 |
| III. Irrelevant | | | | | | | | | | | 0 |
| IV. Lies | | | | | | | | | | | 0 |
| V. Just Not Credible | | | | | | | | | | | 0 |
| VI. Corporate Responsibility in Action | | | | | | | | | | | 0 |
| VII. Dubious Certifications and Labels | | | | | | | | | | | 0 |
| VIII. Political Spin | | | | | | | | | | | 0 |
| IX. Co-Opted Endorsement | 1 | | | 1 | | | | | | | 2 |
| X. No Proof | | 1 | | 6 | | | | | 1 | | 8 |
| XI. Vagueness | 2 | 1 | 1 | 1 | 4 | 6 | 1 | | 1 | 1 | 18 |
| XII. Misleading Symbols | | | | 2 | | | | | | | 2 |
| XIII. Jargon | | | | | | | | | | | 0 |
| Total Claims by Companies | 4 | 6 | 3 | 5 | 22 | 11 | 1 | 2 | 4 | 2 | 60 |

Source: our elaboration

Figure 3 shows that the total number of claims identified is 60, which is an average of six claims per report. In addition, certain types of claims appeared to be more common than others, with the most prevalent areas being “Selective Disclosure”, “Empty Claims”, and “Vagueness”. Figure 4 illustrates that some certificated B Corp companies exhibited greater degrees of greenwashing than others, with Company 5 having 22 claims, compared to only 1 by Company 7.

Fig. 4: Number of greenwashing claims per SME (companies are identified by number from 1 to 10)



Source: our elaboration

4.3 Greenwashing Analysis of SME Reports - Specific Claims

This analysis suggests that greenwashing can still occur within an already certificated company. The section below highlights specific examples of greenwashing claims identified within company reports using our framework.

Claim 1: *Selective Disclosure* - A claim identified in relation to selective disclosure in organisations relying on “offsetting rather than reductions in its own emissions” (Nemes *et al.*, 2022:1), implying that this process is used to compensate for the continuous use of fossil fuels. Regarding offsetting specifically, half of the reports analysed companies that openly admitted that this was the approach taken. For example, Company 2 stated:

“100% of our products are carbon positive (we offset more emissions than we emit)” (Company n. 2, 2022).

However, certain companies admit that this is not ideal, with Company 4 saying:

“it’s important to note that offsets are a last resort after reducing emissions as much as possible We’re not there yet. We describe ourselves as “Carbon Neutral” as it’s pretty much the best we can currently be without closing down the business” (Company n. 4, 2021)

This suggests some SMEs are aware that it is a challenge to remove emissions completely. While this type of greenwashing claim appears to be abundantly present, certain businesses are clearly aware and intend to address offsetting in the future.

Claim 2: *Empty Claims* - An example of this was from Company 10:

“We’re working towards a circular fashion scheme and already recycle our packaging into beautiful earrings” (Company 10, 2021)

It can be argued that this is an empty claim as it leads to, “creating “green talk” through communication that lacks any concrete action with a significant and measurable impact” (Nemes *et al.*, 2022:2). This is because no evidence was seemingly provided alongside this claim to back up the use of recycled packaging.

Claim 9: *Co-Opted Endorsement* - There were two instances of this claim, where the company “help publicize/endorse another organisation’s claim that is a greenwash” (Nemes *et al.*, 2022:4). For example, Company 5 have a page dedicated to their delivery partner (Company z):

“The UK’s most sustainable delivery company” (Company 5, 2021)

They quote from Company z regarding the introduction of 600 new electric vehicles, making up 10% of their fleet. It could be argued that this in itself is an empty claim, given the lack of identifiable impact that these electric vehicles will have. Realistically, it could be said that this claim is tenuously linked to co-opted endorsement, however, it highlights the additional risk SMEs have with working or forming partnerships with other organisations.

Claim 10: *No Proof* - This claim was frequent, and is based around, “statements that are not based on robust, independent, verifiable and generally recognised evidence” (Nemes *et al.*, 2022:4). For example, Company 9 stated in a standalone claim:

“69,000 seedlings planted promoting biodiversity and replacing ageing trees” (Company 9, 2021)

With such a lack of detailed information, it makes it difficult to verify such a claim.

Claim 11: *Vagueness* - Vagueness is shown when, “the words of the claim have unclear/ambiguous meanings that mislead people about the organisation’s environmental footprint/impact” (Nemes *et al.*, 2022:4). A very obvious example of this is the claim by Company 8 - whose main aim is to enable people to easily plant trees to contribute to a more sustainable world (including species protection)-, in regard to their operations:

“Over 60 species saved” (Company 8, 2022)

This will imply that Company 8 has actively saved 60 species from extinction; however, they then go on to say:

“Our sites provide over 60 species of mammals and millions of invertebrates and microfauna” (Company 8, 2022).

Claim 12: *Misleading Symbols* - The occurrence of this claim type only appeared in one report belonging to Company 5. This is where the claim has an “overall presentation designed to evoke an environmental sensitivity that overstates the achieved environmental benefit” (Nemes *et al.*, 2022). By using symbols supported by some short sentences, the company implies that normal toilet roll production causes some negative impacts on health or the environment, for example, to an extreme extent. In contrast, their own product would have zero association throughout each stage of its lifecycle. Ultimately, using such symbols does not accurately represent the environmental benefits of its product.

Through the above qualitative analysis, we found that there is evident scope for greenwashing within certificated B Corp businesses.

5. Discussion

The majority of B Corp businesses within our sample come under the “Service with Minor Environmental Footprint” category, where the “Environment” IA may have a lower priority. Moreover, as found in many of the cases identified, the B Corp scheme enables an extremely low environmental score to be misrepresented by the certification (Kareiva *et al.*, 2015), with the certificate intended to convey both high standards of environmental and social performances.

To ensure greater accuracy and to prevent stakeholders from being misled, there should be a minimum verifiable threshold for each single impact area in order for B Corp status to be granted (Liute and De Giacomo, 2022).

In fact, given that our sample consisted of businesses that were predominantly part of the “Service with Minor Environmental Footprint” sector, minimum thresholds would make it very difficult for these companies to gain B Corp status, as they would have relatively low environmental average scores. This would affect the volume of B Corp uptake among SMEs in the UK.

An alternative solution to minimum thresholds, would be to divide B Corp certification into two separate awards, with one focusing on social practices, and another on environmental standards. In this adaptation, businesses within “Service with Minor Environmental Footprint” would be ineligible for the environmental standards certification but could still receive the social certification.

This would enable participating companies to still receive B Corp certification but decoupled from the conveyance of high environmental performance standards. Splitting the certificate could also increase the status and reputation of a specific B Corp environmental certification, and thus motivate companies to achieve higher environmental performance to qualify for a more prestigious certification. This would be very positive for business and commercial interests.

However, an additional certificate and label would add to the continuing issue of the over-abundance of certificates, which stakeholders and consumers are often unable to distinguish between (Burger-Helmchen and Siegel, 2020). Moreover, businesses that focus solely on an environmental certificate, may see their social performance fall in response to this, essentially creating another problem.

The identification of different unsubstantiated green claims within company reports highlighted that already certificated B Corps still exhibit greenwashing. However, the nature of greenwashing can vary significantly from intentional to unintentional (Szabo and Webster, 2021). With the majority of claims from the findings categorised as “Selective Disclosure” and “Vagueness”, it is reasonable to take the stance that these are less harmful and misleading than “Lies”, “Just Not Credible” or “Political Spin” (Nemes *et al.*, 2022), which were not identified across any of the reports.

For many SMEs, the stringency and transparency of their environmental claims in their reports is not a major priority. SMEs could therefore, upon gaining B Corp status, receive additional support from B Lab around communicating their environmental and social performances with perhaps targets for improvement.

This will not only protect the reputation of the SME, but also of B Lab, whose reputation could be damaged beyond repair if it is perceived to be awarding businesses for positive environmental performance, yet greenwashing claims still occur.

6. Conclusions

6.1 Theoretical Contribution

We have presented an original contribution to the literature on greenwashing and sustainability (Boiral, 2007; Delmas and Burbano, 2011; Lyon and Maxwell, 2011; Lyon and Montgomery, 2015) and, specifically, on greenwashing in the case of B Corp. We have explored the case of B Corp certified companies, which represent a voluntary sustainability standard which has not been widely explored by the literature on sustainability management. In fact, there are few papers regarding B Corp and communication (e.g., Nigri *et al.*, 2017), SME-specific coverage of CSR, the use of voluntary sustainability certifications, and the practical application of a theoretical greenwashing framework to SME reports.

Our findings suggest that while voluntary sustainability compliance can be achieved in a number of areas, these are primarily through meeting social criteria rather than environmental criteria within the B Impact Assessment. In fact, for most typical SMEs in our sample, the instances of positive social standards came at a cost to environmental standards, rather than the opposite. This implies that even when B Corp promotes CSR, there are considerable deficits in its environmental performance representation of SMEs, thus presenting a key legitimacy issue. These findings confirm previous studies that found an ambiguous effect of sustainability standards on corporate environmental performance (Aragòn-Correa *et al.*, 2020; Boiral, 2007; Boiral and Henry, 2012; Barla, 2007; King *et al.*, 2005; Marrucci and Daddi, 2022; Heras-Saizarbitoria *et al.*, 2020b).

Moreover, by showing that poor environmental performance may exist despite the presence of a B Corp certification, our findings suggest that sustainability standards could be adopted by companies merely as a response to institutional pressures and to gain legitimacy from stakeholders (Bansal and Bogner, 2002), rather than actually improving their sustainable performance (Aravind and Christmann, 2011; Castka and Prajogo, 2013). Our results thus support those studies arguing the existence of symbolic compliance by companies (Meyer and Rowan, 1977) with apparently sustainable strategies and actions but no real implementation. Our study thus also advances knowledge in the research area of symbolic compliance and environmental strategies (Delmas and Montes-Sancho, 2010; Hyatt and Berente, 2017; Martin-de Castro *et al.*, 2017; Iatridis and Kesidou, 2018; Truong *et al.*, 2021). Specifically, we show that the certification does not usually act as a buffer against symbolic environmental behavior (Christmann and Taylor, 2006; Vilchez, 2017).

6.2 Practical Implications of Study

Our research could be of practical merit to a range of SMEs, consumers, B Lab, and other voluntary sustainability certification providers.

Firstly, our results suggest that SMEs could consider alternative voluntary certificate providers that align more with their values or, at the very least, consider all three parts of the Triple Bottom Line (TBL) approach

equally (Elkington, 1998). For instance, SMEs that wish to showcase their social achievements, should be wary of the B Corp certificate potentially misleading stakeholders by portraying strong environmental performance, when in the assessment they only excelled in social orientated IAs. From a reputational perspective, if found to not exhibit accurate, rigorous environmental performance, SMEs could be severely damaged. SMEs should thus carefully consider what voluntary certification they want to achieve and how this will reflect with different stakeholders.

Secondly, the findings can be useful for B Lab itself, which could place greater focus on the “Environment” IA. Additionally, B Lab could introduce further instruments to ensure participating SMEs cannot include any form of unsubstantiated green claim within their company reports or website. These changes could be shown in the next version of the BIA and would help firm up B Lab’s legitimacy in regard to the accuracy and credibility of the certification it offers. In that sense, the new EU policies, such as the EU Proposal of Directive on Green Claims (European Parliament and Council, 2023), aiming to promote reliable green claims at a corporate level, or the EU Corporate Social Reporting Directive (European Parliament and Council, 2022), should, in general, also reduce greenwashing.

Thirdly, the successful application of the greenwashing framework to identify claims in SME publications supports the assertion that it can have practical applications and not merely academic purposes (Nemes *et al.*, 2022). Before releasing information to stakeholders, SMEs would be able assess their own communications against that framework (Nemes *et al.*, 2022) -in addition, for example, to EU policy principles that will be defined to contrast greenwashing- and remove misleading claims related to their green credentials.

Finally, policymakers could have a key role in promoting reliable green claims at a corporate level. In that sense, the recent and previously mentioned EU Proposal of Directive on Green Claims represents a key measure in reducing instances of greenwashing of companies. In fact, that proposal includes clear criteria on how companies should prove their environmental claims and labels, with the aim to make green claims reliable, comparable and verifiable across the EU. As a consequence, these kinds of policies would also reduce the greenwashing risk within certified SMEs.

6.3 Limitations and future areas of research

This research provides a unique perspective on unsubstantiated green claims that we have identified in the reports of B Corp SMEs-certified companies. However, it did not look into the actual number of occurrences of specific claim types in relation to the Environment B Corp score. Future research could, therefore, focus on this aspect.

We focused solely on one voluntary certification type, B Corp, yet there are also many other certifications that could undergo similar investigations. Conducting research of a similar design but with a wider range of certificate providers will also assist in highlighting methodological flaws in the providers’ processes, while also identifying potential occurrences of greenwashing in the participating companies.

We found that poor sustainable performance may still exist for certified companies despite them having certifications. Thus, our paper is in line with the institutional theory suggesting the symbolic compliance of companies to respond to institutional pressures. However, we did not explore if and how those pressures represent a driver for B Corp adoption in our sample. Future studies could investigate whether certified companies with poor environmental records, for example, adopted the certification merely to respond to specific pressures.

Our framework is based on Nemes *et al.* (2022), and can support multiple subjects (e.g., journalists, researchers, policymakers) to easily identify and assess specific green claims (Nemes *et al.*, 2022). However, it needs to be regularly updated, and it does not consider different sizes of companies and their different abilities. Moreover, we only based on Nemes *et al.* (2022); however, other documents or references could be adopted to identify and assess green claims.

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Appendix 1.

Integrated Framework of Greenwashing (Nemes *et al.*, 2022)

The appendix is available here:

<https://www.mdpi.com/2071-1050/14/8/4431#supplementary>

sinergie
italian journal of management

ISSN 0393-5108
ISSN 2785-549X
DOI 10.7433/s122.2023.03
pp. 49-69

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Digital servitization as Business Model Innovation: an explorative study on the role of absorptive capacity

Received
12th December 2022

Revised
14th March 2023

Accepted
18th October 2023

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Abstract

Frame of the research: Firms often face the digitalization paradox. Digital servitization may be the key to unlocking the value of investing in digital technology. More research is needed on the enabling factors of such processes. Notably, the extant literature suggests that dynamic capabilities can play a role. Hence, we suggest that ACAP, as a particular type of dynamic capability, positively influences the relationship between Industry 4.0 adoption and digital servitization.

Purpose of the paper: The study investigates how the firm's absorptive capacity allows to appropriate value from Industry 4.0 by enabling digital servitization.

Methodology: A single case study based on semi-structured interviews with key informants.

Findings: The business model innovation process towards digital servitization started with the value proposition to affect the value creation and value capture dimensions. Significant changes exist in product/service development, human resources competencies, and business relationships with customers and suppliers. The firm's absorptive capacity represents a significant enabler of such a process.

Research limits: A single case study suffers from limitations related to the external validity of results, which may be overcome by a multiple case study. Besides, increasing the number of interviews and collecting data from other actors (e.g. customers, suppliers, etc.) would allow a broader view.

Practical implications: Developing absorptive capacity might help manufacturing firms in overcoming the digitalization paradox. Managers should encourage exploratory, transformative, and exploitative learning that can facilitate the provision of value-added services that allow the firm to appropriate value by enhancing its bargaining power and expanding its market.

Originality of the paper: The study primarily contributes to the digital servitization literature by providing empirical evidence on its enabling factors. It also contributes to the knowledge management field and the literature on absorptive capacity.

Key words: industry 4.0; digitalization; digital servitization; business model innovation; absorptive capacity; single case study

1. Introduction

Industry 4.0 (I4.0) offers tremendous opportunities for manufacturing companies' growth and innovation given the ongoing paradigm shift from

an industrial to a more digital economy (Porter and Heppelmann, 2015). Yet, firms often experience the “digitalization paradox”: despite significant investments in digitalization, they often fail to achieve the expected revenue enhancement (Gebauer *et al.*, 2020; Kohtamäki *et al.*, 2020). For instance, firms tend to invest in advanced digital technologies without a clear strategy for how customer-related data would be used to improve financial performance (Kohtamäki *et al.*, 2020).

To achieve the envisioned results, companies should not merely adopt I4.0, but rather leverage these technologies to innovate their business models (BMs) (Gebauer *et al.*, 2020; Müller *et al.*, 2021, 2018). Notably, deploying digital technologies to support the transition from a product-centric to a service-centric BM may be the key to unlocking the value of digitalization (i.e. digital servitization BMs) (Coreynen *et al.*, 2017; Kohtamäki *et al.*, 2020, 2019; Tronvoll *et al.*, 2020). Yet, although the concept of digital servitization (DS) has been gaining momentum, the empirical evidence on the relationship between digitalization and servitization in manufacturing companies is scant (Kohtamäki *et al.*, 2020; Tronvoll *et al.*, 2020). This far, the literature has focused on identifying specific DS pathways (Coreynen *et al.*, 2017) and understanding how DS affects financial performance (Kohtamäki *et al.*, 2020), whereas little is known about the factors that might help firms to innovate their BM towards DS (Coreynen *et al.*, 2020).

Scholars suggest that DS might depend on companies’ resources and capabilities, experience, and organizational routines (e.g. Coreynen *et al.*, 2020, 2017; Paiola *et al.*, 2021). In this regard, previous studies showed that absorptive capacity (ACAP) is a fundamental capability to stimulate various forms of innovation, including business model innovation (BMI) (Ali *et al.*, 2016; Kostopoulos *et al.*, 2011; Miroshnychenko *et al.*, 2021). Hence, we suggest that the absorptive capacity (ACAP), which is commonly conceptualized as a particular type of dynamic capability (Zhara and George, 2002; Miroshnychenko *et al.*, 2021) and specifically, the capability of identifying, assimilating, transforming, and applying external knowledge (Cohen and Levinthal, 1990), is a suitable theoretical lens to understand how companies can effectively reap the benefits of an I4.0-enabled transition (Ardito *et al.*, 2021).

Specifically, I4.0 leads to redesigning the BM of established companies by incorporating new external knowledge into internal activities (Müller *et al.*, 2020). As such, I4.0 requires firms to re-examine the ways they can effectively manage external and internal knowledge (Ardito *et al.*, 2021). Firms wanting to successfully leverage external sources need to develop internal capabilities to acquire, internalize, and exploit external knowledge (Cohen and Levinthal, 1990).

Therefore, this article employs a single case study to investigate the enabling factors of DS by emphasizing the role of ACAP. We aim to answer the following research question: how does the firm’s ACAP allow appropriate value from I4.0 adoption by supporting DS? Put differently, is ACAP an enabling factor of DS? To the best of our knowledge, this is the first attempt to empirically show how ACAP facilitates DS. In doing so, the article provides a novel perspective to the literature on DS and knowledge management (KM) by linking ACAP to digital-driven BMI processes.

2. Literature background

2.1 Digital servitization as business model innovation to mitigate the digitalization paradox

Based on digitization, automation, and interconnection, I4.0 represents a paradigm shift in the manufacturing industry toward the next industrial revolution (Liao *et al.*, 2017; Müller *et al.*, 2018).

I4.0 leads to more efficient product development, more efficient and flexible manufacturing, more sophisticated products and services, more integrated value chains, higher customization (Müller *et al.*, 2018), improved customer participation in product design (Naeem and Di Maria, 2021).

Yet, although companies face complex processes and high budgets, they fail to achieve the expected revenue growth (i.e. digitalization paradox) (Gebauer *et al.*, 2020). In other words, when cumulative investments in digitalization are relatively small, revenue enhancement remains in line with expectations. However, as cumulative investments increase, companies increasingly face the digitalization paradox and do not obtain the projected revenue enhancement. Following another perspective, a large majority of firms remain stuck in the so-called “pilot purgatory” (Gregolinska *et al.*, 2022), experiencing several difficulties in capturing the full potential of their investments.

A possible reason could be that companies find difficulties in successfully leveraging digital technologies to change their BMs (Gebauer *et al.*, 2020; Paiola, 2018). Interestingly, Kohtamäki *et al.* (2020) find that the decreasing returns from digitalization to firm performance are mitigated by higher levels of servitization, which could be an effective path for creating and appropriating value from digitalization in manufacturing companies.

The concept of “servitization” is largely acknowledged as a transformation journey of product-centered firms that manifests in advanced services and integrated solutions (Baines *et al.*, 2009; Ulaga and Reinartz, 2011). A cornerstone of servitization is strong customer centricity (Baines *et al.*, 2009). Such orientation consists in the shift from product-oriented services to user processes-oriented services as well as in the shift from selling to cultivating customer relationships (Oliva and Kallenberg, 2003).

The literature acknowledges different servitization types that can be positioned on a product-service continuum, whereby services might complement products or entirely substitute them (Baines *et al.*, 2009; Tukker, 2004). Overall, servitization seems to offer several opportunities for manufacturers, such as strategic differentiation and competitive advantage (Gebauer *et al.*, 2011), high-profit margins (Baines *et al.*, 2009), and building unique and long-term customer relationships (Tukker, 2004).

Servitization is largely considered a way to innovate the BM of product firms (Casprini, 2015; Frank *et al.*, 2019; Paiola and Gebauer, 2020), affecting the product firms’ value proposition, value creation, and value capture mechanisms (Ayala *et al.*, 2017; Frank *et al.*, 2019). Through

servitization, BMI follows a demand-pull innovation trajectory, where the value proposition is focused on the customers (Frank *et al.*, 2019). Turning into a service provider represents a shift in focus since the firm intends to generate higher revenues from the service part of the business. Besides, service strategies entail building an ability to deliver services, changing long-standing practices, training personnel to become service-oriented, as well as developing a new organizational culture (Baines *et al.*, 2009).

Nowadays, digital technologies are deemed to enable servitization in the manufacturing industry (Kohtamäki *et al.*, 2019; Paiola and Gebauer, 2020) and the term “digital servitization” appeared to describe the convergence of servitization and digitalization (Gebauer *et al.*, 2021). Various definitions of DS exist in literature; we refer to Paschou *et al.*’s (2020) conceptualization as “the development of new services and/or the improvement of existing ones using digital technologies. These can be exploited to enable new (digital) business models, to find novel ways of (co)creating value, as well as to generate knowledge from data, improve the firm’s operational and environmental performance, and gain a competitive advantage” (p. 284).

DS might occur through different pathways which demand different resources and capabilities and lead to different benefits (Coreynen *et al.*, 2017; Paiola and Gebauer, 2020). It not only brings value to customers but rather data and information gathering might also improve internal processes (Frank *et al.*, 2019). Moreover, DS is likely to affect the bargaining power in different sections of the value systems and how manufacturers increase their power using digitalization (Kohtamäki *et al.*, 2020). For instance, DS generates closer provider-customer relationships characterized by co-creation logic, long-term commitment, and greater investment in the relationship (Coreynen *et al.*, 2017).

Scholars suggest that a successful DS depends on companies’ resources and dynamic capabilities (e.g. Coreynen *et al.*, 2020, 2017; Paiola *et al.*, 2021). Design-to-service capability, service sales capability, user involvement capability, as well as dynamic capabilities, such as customer needing interpretation capability, and data processing capabilities, allow manufacturers to overcome DS challenges (Coreynen *et al.*, 2017; Ulaga and Reinartz, 2011). According to Paiola and Gebauer (2020), extant manufacturing resources and capabilities (such as a firm’s in-depth product knowledge) need to be complemented with new ones and firms need to possess the ability to constantly reconfigure their strategic capabilities to meet continuously evolving customer needs (Bustinza *et al.*, 2018).

Hence, it is likely that dynamic capabilities, and particularly the capabilities of combining external and internal knowledge, are significant enablers of DS as BMI, in the context of I4.0.

2.2 Absorptive capacity

ACAP was defined by Cohen and Levinthal (1990, p. 128) as “the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends”. Such concept spans beyond the resource-based view (Barney, 1991) by contending that differences in organizational

performance and competitive advantage can be explained by companies' different abilities to explore, assimilate, and exploit new knowledge over time (Schlagwein and Hu, 2016; Zahra and George, 2002). Therefore, even though a firm's ACAP is dependent upon prior related knowledge (Cohen and Levinthal, 1990), the predominant theoretical view is that it is not an asset, but rather a particular type of organizational dynamic capability (Chichkanov, 2021; Hussain *et al.*, 2022; Zahra and George, 2002).

It is well known that ACAP influences innovation and firms' performance (Gebauer *et al.*, 2012; Miroshnychenko *et al.*, 2021; Todorova and Durisin, 2007; Zahra and George, 2002) and also the innovation of a business model (e.g. Bhatti *et al.*, 2021; Kranz *et al.*, 2016; Miroshnychenko *et al.*, 2021; Müller *et al.*, 2020). The recombination and integration of internal and external knowledge play a crucial role in renewing or reinventing the fundamental components of BMs. In addition, the ability to acquire and use external knowledge can provide firms with new ideas on how to change the current BM to extract and capture more value. In the I4.0 scenario, the assimilation of external knowledge is even more critical for the successful transformation of processes and products, especially for traditional and incumbent organizations (Ricci *et al.*, 2021; Siachou *et al.*, 2021)

Significantly, not only technological knowledge is relevant, but also market knowledge (Kranz *et al.*, 2016; Lane *et al.*, 2006) and this could be especially important in servitization because it often entails targeting new customer segments.

Following this line of reasoning, we may suggest that ACAP is a fundamental capacity in the transition towards servitization because it allows firms to use external knowledge - for example, the "knowledge from customer" - more efficiently, to easily sense new opportunities and to enhance the service value proposition offered. In the KM field, the acquisition of client knowledge through the wide number of digital channels and the assimilation of such knowledge across different functional areas are positively associated with both product and business process innovations in knowledge-intensive business services (Chichkanov, 2021). Moreover, Coreynen *et al.* (2020) found that both exploitation and exploration are associated with digital servitization and ACAP is positively related to such activities (Escribano *et al.*, 2009; Müller *et al.*, 2021). It is worth noting that DS calls for collaboration across firm boundaries within ecosystems (Tronvoll *et al.*, 2020; Kohtamaki *et al.*, 2019), and, therefore, ACAP is likely to play a pivotal role in leveraging knowledge within such networks. Finally, ACAP may facilitate the embedding of digital technologies needed for service transition. Hence, we posit that ACAP could be a fruitful theoretical lens for understanding the enabling factors of DS in an I4.0 context.

The literature conceptualizes ACAP as a group of intangible capabilities to manage knowledge (e.g., Saiz *et al.*, 2018) or as several distinct but complementary dimensions, namely acquisition, assimilation, transformation, and exploitation of external knowledge (Ardito *et al.*, 2021; Zahra and George, 2002). According to the second perspective, Lane *et al.* (2006) propose a learning process-oriented definition by arguing that ACAP is a firm's ability to utilize external knowledge through three

sequential processes: (1) recognizing and understanding potentially valuable new knowledge outside the firm through exploratory learning, (2) assimilating valuable new knowledge through transformative learning, and (3) using the assimilated knowledge to create new knowledge and commercial outputs through exploitative learning. We adopt this perspective in interpreting the empirical findings of our research and suggest that ACAP may influence the relationship between the I4.0 investment and the business model transformation toward DS.

3. Research method

3.1 Single case study

Since research on DS is still in its infancy (see Kohtamäki *et al.*, 2020; Tronvoll *et al.*, 2020), we adopt a single case study to investigate the driving factors of DS in an I4.0 context. A single case study does not aim at statistical generalization, but rather its objective is a thorough analysis and understanding of a single subject. The case study method is best suited to properly answer 'how' and 'why' questions, thus supporting the analysis of complex phenomena in which many elements, processes, and actors must be considered as they interact with one another. As such, this method appears particularly useful to provide in-depth information and allow for a comprehensive and realistic understanding of the phenomenon under investigation (Yin, 2014), to fully grasp the dynamics and complexities of DS which are linked to the specific context of the analysis.

The case company (Alpha) is a family-owned small and medium-sized (SME) footwear manufacturer, working as a sub-supplier for high-luxury fashion brands. The reason for selecting this firm is twofold. First, since 2014 it has progressively invested in I4.0 to support a transition process from being a mere supplier of products (sub-supplier) to becoming an advisor and consultant by providing value-added services relating to the customers' product design process. Hence, servitization spans beyond the scope of supporting the functioning of the product or the creation of additional cash flows due to customer's purchase of new services to encompass a path that adopts a customer-centric perspective to enhance customer satisfaction and loyalty in the long run (Raimondi, 2011).

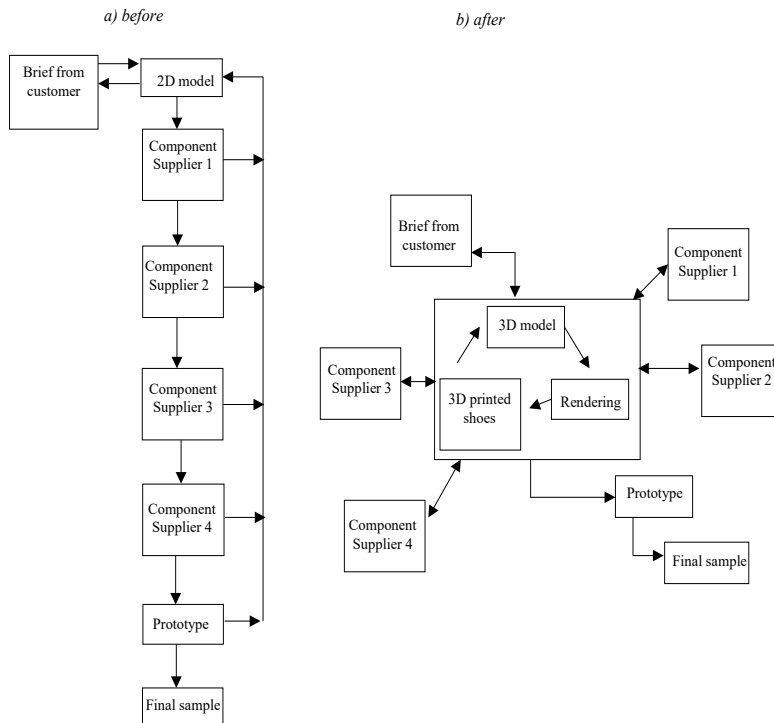
Notably, Alpha has significantly invested in I4.0 by focusing on two major technological areas:

- 3D technologies (i.e. 3D rendering, 3D printing, 3D configurators). Such technologies are customer-centric innovations that entail significant implications even for companies in the most traditional industries (Martinelli, 2018). Specifically, 3D rendering and 3D printing are aimed at changing the product development process (Fig. 1). The previous model was based on a sequential and iterative process involving footwear samples, fittings, and design-related changes to transform the initial customer's idea into the final product. It was a very expensive and time-consuming process, also entailing communication problems between the parties. Digital technologies allow a circular and

iterative model to design a detailed 3D rendering which is then printed in artificial resin. Moreover, the firm invested in 3D configurators for physical stores owned by B2B customers as well as for the e-commerce website for the B2C market.

- Two robotic machines aimed at replacing human interventions in the production process to relieve workers of dangerous processing tasks (e.g. due to unhealthy powders and glues) and alienating activities.

Fig. 1: The product development process before and after the adoption of 3D technologies



Source: authors' elaboration

Thus, the case is especially relevant due to the use of digital technologies geared toward the shift from product-centric to service-centric business logic. Moreover, for such a commitment to the implementation of I4.0, the firm was awarded the Innovative SME and SMAU Innovation prizes. Second, Alpha provided a very high level of access to the firm (De Massis and Kotlar, 2014) as researchers were able to interview key informants (i.e. the company's owner, the marketing consultant, and the project manager) on multiple occasions during the period of the study.

3.2 Data collection and analysis

Study data were collected between May 2018 and November 2020 by using multiple sources to guarantee triangulation and provide stronger

empirical evidence (Eisenhardt, 1989) (Table 1). Semi-structured face-to-face interviews represent the primary source to ensure uniform coverage of the research themes as well as the right flexibility in gathering key informants' free descriptions and opinions. Direct observation and archival data analysis were employed to provide additional information, verify, and increase evidence (Eisenhardt, 1989). For instance, the firm's website and presentation about I4.0 were used to assess the investment in such digital technologies, whereas on-site visits allowed to see how the I4.0 technologies are employed in the firm.

Tab. 1: Data collection

| Data source | Date | Key informants | Duration |
|--|------------|--|------------|
| Interview | 11/05/2018 | Owner and Marketing Consultant | 1.30 hours |
| On-site visit | 11/05/2018 | - | - |
| Interview | 7/12/2018 | Marketing Consultant | 2 hours |
| Interview | 20/11/2019 | Marketing consultant and Project Manager | 2 hours |
| On-site visit | 20/11/2019 | - | - |
| Interview | 28/01/2020 | Marketing Consultant | 2 hours |
| Interview | 13/11/2020 | Owner and Marketing Consultant | 1 hour |
| Archival data | | | |
| Website, presentations in workshops and conferences about Industry 4.0, meeting reports, articles on specialized magazines | | | |

Source: authors' elaboration

We conducted five interviews with key informants involved in the DS process and two on-site visits. The interviews lasted between one and two hours, they were conducted in Italian, audio recorded, and transcribed verbatim. The interview track was based on open-ended questions within a standardized protocol to ensure both guidance and consistency in the interviewing style as well as an adequate level of freedom in answering.

The interview guideline is structured into four sections (Table 2). First, the respondents were asked to describe the firm's business and clarify their professional role in the company. The second section aims to shed light on the I4.0 technologies used and their application, by highlighting benefits and challenges. The third section is devoted to investigating the effects of such technologies on the way of doing business. Finally, the fourth section consists of follow-up questions to better understand the role of absorptive capacity understood as the ability to assimilate, transform, and exploit external knowledge to support DS.

We performed a manual coding aggregating the data into categories that facilitate the analysis (De Massis and Kotlar, 2014; Miles and Huberman, 1994). Before being analyzed, the information gathered was manipulated by applying data reduction and condensation to ease the analysis and focus on which data best answers the research question. Then, we labeled interview pieces that have the same message or are connected in some way and added an accompanying explanation of what the selected excerpts have in common. Such coding process employed an abductive approach (e.g. Dubois and Gadde, 2002) . By doing so we used case study data to

illustrate how the firms' ACAP may represent the key to unlocking the potential value of digital technologies (specifically I4.0 technologies) in DS.

Tab. 2 Interview guideline

| |
|---|
| 1st section - Background information |
| <p>Could you give us some general information about the company (e.g., industry, turnover, employee number, etc.)?</p> <p>Could you briefly describe the company's historical background?</p> <p>Please describe shortly the current company's business. What are the company's main products, activities, and markets?</p> <p>What is your professional role in the company?</p> |
| 2nd section - Leveraging I4.0 |
| <p>Can you point out the key ways you use I4.0 technologies and in which fields?</p> <p>What are the key benefits of using I4.0?</p> <p>What are the main challenges of using I4.0 in your business?</p> |
| 3rd section - Digital servitization |
| <p>What products and services are provided to the customer (<i>ask for concrete examples of basic - e.g. warranty - intermediate - maintenance, training - advance - support agreements outsourcing - services</i>)?</p> <p>What are the main opportunities that I4.0 provides to expand your service-oriented offerings?</p> <p>How do I4.0 technologies impact your way of doing business?</p> <p><i>Follow-up questions on DS as BMI (if not mentioned by the respondent)</i></p> <ul style="list-style-type: none"> - <i>What are the main changes in customer segments related to the implementation of I4.0?</i> - <i>What are the main changes in customer relationships related to the implementation of I4.0?</i> - <i>What are the main changes in distribution channels and activities related to the implementation of I4.0?</i> - <i>What are the main changes in supplier/partner relationships related to the implementation of I4.0?</i> - <i>What are the main changes in the firm's key resources and activities related to the implementation of I4.0?</i> - <i>What are the main changes in the revenue streams and payment methods related to the implementation of I4.0?</i> - <i>What are the main changes in cost structure due to the implementation of I4.0?</i> |
| 4th section - Absorptive capacity |
| <p>What is the role of I4.0 in acquiring new external knowledge?</p> <p>What is the role of I4.0 in enhancing customer understanding?</p> <p>Who oversees collecting and using the acquired external knowledge?</p> <p>How is external knowledge employed?</p> <p>What is the relationship between the newly acquired knowledge and the firms' existing knowledge and expertise on products and customers?</p> <p>Which tools are employed to spread knowledge in the firm?</p> <p>How does the use of external knowledge contribute to the development of new services?</p> <p>Are there any challenges related to the acquisition and use of external knowledge?</p> |

Source: authors' elaboration

4. Findings: innovating the business model toward digital servitization

Alpha is shifting from a product-centric to a service-centric BM. This DS process started in the product design and development area to affect the entire firm's business logic by requiring significant transformations in organizational competencies as well as business relationships with customers and suppliers. This section describes the firm's DS by highlighting

how the implementation of I4.0 technologies changes the three main BM areas: value proposition, value creation, and value capture. To support the study findings, illustrative quotes relating to changes in each BM area are provided in Table 3.

a) Value proposition

I4.0 technologies allowed Alpha to transform its value proposition from idea generation to prototyping and the following production of the footwear sample.

The implementation of 3D technologies improves Alpha's capability of identifying and acquiring externally generated knowledge (cf. acquisition and assimilation of external knowledge) on customers' needs. Before the investment in such technologies, understanding customers' requirements was rather difficult due to the vagueness of the designer's idea of the final product (in terms of materials, shapes, accessories, etc.); hence, customer knowledge was only available upon realizing footwear physical samples. On the contrary, 3D rendering allows to work on products' digital images, instead of directly creating a prototype or a sample. Moreover, Alpha offers a virtual fitting service which appears extremely helpful for customers' product configuration. Enhanced customer knowledge can be used to fine-tune the model in real-time based on its needs as well as create tailor-made products. This has significantly streamlined the entire product design and production process.

Hence, Alpha shifts its value proposition from producing the final product (i.e. shoes) and being a mere sub-supplier toward integrating value-added services throughout the entire design process, thus becoming an advisor and consultant. In this regard, the firm plays a pivotal role in translating the customer's idea (generally a sketch or a brief) into a real product. Alpha's customers are luxury fashion houses, lacking an internal division dedicated to accessories (i.e. shoes and bags), thus needing a sub-supplier that can interpret and convert the designer's idea into products. Overall, this allowed the firm to become highly specialized, while offering an innovative service and becoming a partner for the client instead of a mere manufacturer.

Customization is another dimension of the company's digitally enabled service-oriented value proposition. The firm guarantees the ability to fully customize the product for the business customer. Changes to the product forerun the prototype and the final sample to significantly reduce design errors and increase product quality.

Leveraging 3D technology to design products makes variability, which is usually costly as it requires changing physical parts, far cheaper. Moreover, the company aims to seize the opportunity to access the end consumers by investing in digital product configurators to offer a customization service both in third-party stores and through the firm's e-commerce website.

b) Value creation

Business model changes affecting the value creation mechanisms relate to three specific aspects: organizational competencies, production efficiency, and supplier and partner relationships.

Firstly, the adoption of I4.0 technologies requires Alpha to complement its traditional technical expertise on shoe making (i.e. prior knowledge) with the newly acquired knowledge and develop additional capabilities. As the customer does not have the technical know-how to design and create the product, Alpha's long-standing technical skills are pivotal. Alongside this, the firm displays the development of unique customers needing interpretation capabilities to integrate its prior knowledge of products with the new knowledge regarding customers' needs and requirements for providing value-added services. Moreover, Alpha is consistently enhancing the employee's digital-related capabilities to manage 3D technologies and use digital technical data sheets, which specify the prototype and product details (e.g. leather, lining, etc.).

All this information represents a valuable knowledge asset that Alpha is nowadays able to code and share in real-time between the departments involved in the design and production processes to support the development of value-added services. In this regard, the interviewees highlighted that if all the models created in the last twenty-five years had been recorded, as they are now, today Alpha would have an incredible amount of knowledge. Moreover, the possibility to share and internalize data across departments via digital channels significantly reduces errors.

The implementation of I4.0 also required a generational change, especially at the production level, as the workforce needs to use digital technologies (e.g. tablets, robotic machines, etc.) to acquire customer data and information to correctly fulfill their tasks.

Secondly, value creation-related changes entail greater efficiency in the design and production processes. Thanks to 3D technology and its capability of collecting and assimilating valuable knowledge, Alpha cuts errors and costs for physical prototypes by avoiding unnecessary expenses for molds and real accessories. Moreover, this also shortens the timeframe for their development as the entire process can be executed in a shorter time without waiting for its suppliers to make the molds before showing a prototype to the customer.

Thirdly, Alpha's value creation changes also relate to relationships with suppliers and partners. Alpha can show the prototype through 3D technologies to its customers, without waiting for the shape or the mold to be made, thus becoming less reliant on suppliers, and acquiring more power in the relationship.

Moreover, sharing 3D files among all the parties involved in the design and production processes (i.e. customer and component suppliers, such as heel and sole factories) fosters a more intense collaboration along the entire supply chain and a significant reduction of the time-to-market. Interviewees also noted that such knowledge-sharing mechanisms with suppliers streamline the communication flow and ease the job.

Alpha is also increasingly involved in strengthening collaborations with external actors, mainly schools and universities, that provide technical support for ensuring the customization service. Moreover, since Alpha has invested in developing its brand, it relies on university collaborations to develop marketing-related knowledge and competencies. The interviewees also emphasized that training individuals to perform new professional roles

is pivotal for the entire supply chain. In this regard, universities become a valuable source of specialized expertise.

c) Value capture

Although Alpha has not yet experienced changes in its revenue model, a shift towards DS enhanced the value capture mechanisms by improving existing customer relationships and acquiring new customers.

First, business relationships of mere shoe sub-suppliers are usually extremely biased in favor of the customers. Alpha's capability to combine its technical expertise in footwear with new knowledge to develop customer-needing interpretation capabilities, allows it to successfully develop co-design activities with its customers, thus becoming a consultant throughout the entire design process - from the prototyping to the final product. The creation of such a partnership allows Alpha to acquire greater bargaining power in the relationship.

Moreover, the use of 3D technologies and increased knowledge sharing enhances customer contact, hence allowing them to overcome the physical distance, which was one of the main problems in the customer relationship. In this regard, Alpha employs new mechanisms for customer interaction through digital communication. Alpha can share 3D files with customers which significantly eases real-time interactions and understanding of customers' needs. Similarly, interviewees emphasize the tremendous advantage of using a virtual fitting room which allows the customers to reduce the number of business trips and expedite the entire design and production process.

Finally, the shift toward DS also allows the acquisition of new customers. Notably, alongside traditional B2B customers (i.e. luxury fashion houses), Alpha is now reaching new startups owned by young designers eager to emerge in the luxury industry. Moreover, the firm is also approaching the B2C market by moving toward the end consumer through investments in 3D configurators and individually tailored value offers.

Tab. 3: Illustrative quotes

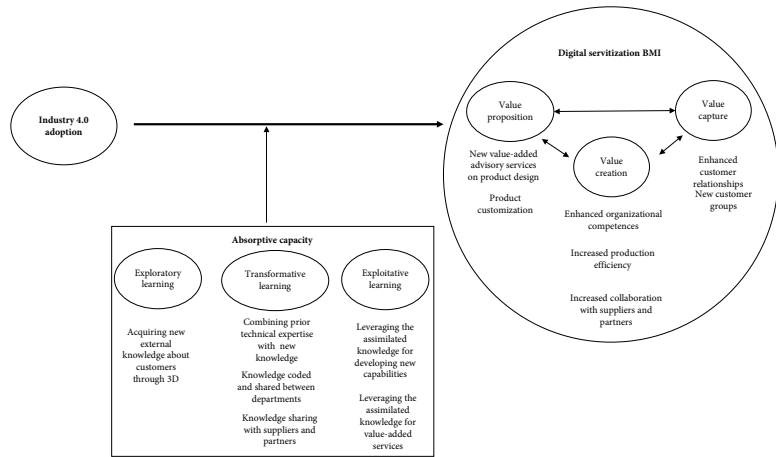
| Illustrative quotes | Digital servitization |
|--|--|
| | Value proposition-related changes |
| Marketing consultant: "Once the prototype, the mold, the heel, etc. are created, traditional sub-suppliers can verify if the results are what the customer had in mind [...] Customers in the luxury sector need to be taken by their hand. The supplier should take their idea and make it come true. None can guarantee this kind of service in Italy. This allowed us to become partners." | Alpha shifts its value proposition from producing final products (i.e. shoes) to providing digitally-enabled value-added services (i.e. consultancy) throughout the entire design and production process |
| Project manager: "We created a virtual fitting room, where we set up a projector and worked with the model wearing the shoes. In this way, the customer can see what we're working on in real-time, and we can design together the product remotely." | |
| Marketing consultant: "The customer's designer may imagine a given height for the heel, you ask for a mold, then they want to change the height, which requires changing everything and results in additional time and costs. [...] Digital technologies provide us with information to refine the product in the design phase before making the footwear sample. We first design in 3D and create a high-quality rendering to understand if we are on the right path or not." | |
| Project manager: "We provide services from the initial design, as we realize a detailed rendering of the product. Thanks to 3D technologies, we can limit the costs of prototypes by receiving immediate feedback from the customer. Then, we can make a 3D resin shoe a few days after rendering. The designer is usually a clothing specialist who can get the shoe's idea by seeing a rendering or by holding a 3D shoe in his hand." | |

| | |
|---|--|
| Marketing consultant: "Each line they need to make has a given shape, a heel, on which you can create many models. We receive the collection plan for the upcoming season and discuss the details with the customer. For example, 99% of the time they want a customized heel, for which we need to create a specific mold. Even the sole is usually made exclusively for the customer. Likewise, accessories are all customized; a buckle, a button, everything must be made with a special mold." | Alpha provides customization services to B2B customers and seizes the opportunity to directly access the end consumers with customized offerings through product configurators |
| Project manager: "We worked together with a software house for a year and a half to create a configurator that allows the consumer to personalize shoes. Either we place the configurator in outstanding third-party stores for the consumer who physically visits them, or the consumer can do it at home through the e-commerce platform." | |
| | Value creation-related changes |
| Marketing consultant: "The customer lacks knowledge in footwear and recognizes that Alpha holds the technical skills to manage the entire design and production process. They just decide the material and price ranges [...] [Moreover] you need to change your attitude towards each customer; it's a matter of cultural interpretation. This is the difference between a mere third-party sub-supplier and Alpha which is a partner of major luxury fashion houses." | Organizational competencies: Alpha complements the new knowledge and prior knowledge and develops new capabilities, namely customer needing interpretation capabilities and digital technology-related capabilities |
| Project manager: "The style is important, yet when it comes to shoes the technical part is pivotal. [...] We needed to change the workforce's mindset. Today we have a very low average age, and even those working manually use a tablet in their job. These guys are familiar and willing to use digital technology; if we had asked their fathers, they would have never done it." | |
| Marketing consultant: "The digital data sheet indicates the required changes which are shared among the departments in real time. Errors can be significantly reduced. [...] Each change is directly communicated to those in charge of buying the raw materials, developing the model, etc. Years ago, removing an eyelet, adding an accessory, required a written communication, then an email, and if something went wrong, the entire production of the shoes failed." | |
| Marketing consultant: "We used to invest a lot to create a shoe sample in a short time, by making molds for the shape, heels, accessories, and so on. [...] The risk is incurring higher costs to do the same thing ten times over, to customer's second thoughts, and longer timeframes to manage an entire supply chain. [...] Using the 3D and a rendering, I don't waste twenty days waiting for our suppliers. A mold costs € 500-1000, while a 3D heel costs only € 3. You save two-thirds of the time, with much higher quality and cost savings." | Greater efficiency of the design and production processes: Alpha cuts errors and costs for physical prototypes and shortens timeframes |
| Marketing consultant: "You no longer wait for the supplier to make the shape, rather we send the supplier the 3D project by directly sharing all the needed information and reducing the timing. Someone gets angry because they used to earn a lot before. [...] Someone reluctantly accepts the change as 'earning a half is better than nothing', while others have shown interest in these technologies and think about investing in 3D in their business." | Supplier and partner relationships: Alpha increases its power over the suppliers and enhances collaboration along the entire supply chain. Alpha strengthens partnerships with external actors that provide technical support for ensuring the customization service |
| Project manager: "Some of our suppliers have adapted to our needs and we now communicate with them in 3D. When the order is loaded, it is immediately ready." | |
| Project manager: "We asked several universities to find a mechatronic engineer. [...] Customization is how we envision the future, and we are collaborating with some universities supporting us on the technical side to offer a tailor-made service. [...] [Moreover] since we invested in developing our brand, it is also important to work with universities on the marketing strategy." | |
| Owner: "We need to collaborate with universities. The tendency is a generational turnover in manufacturing. However, even young people are reluctant to be trained. I am fascinated by the university and how young people experience this cultural change. The relationship with the University is pivotal." | |
| | Value capture-related changes |
| Marketing consultant: "Traditional sub-suppliers are artisans that cannot succeed with their products. If a company can do the same job at a slightly lower price, the customer might change overnight. [...] We overturned the balance of power by offering a unique service and becoming partners. A mere manufacturer will never be essential. [...] Fashion houses only recommend the style, even the choice of materials is often shared. They acknowledge our expertise and ask us to organize the work" | Alpha acquires power over its customers by developing co-design activities and becoming a consultant throughout the design and production process |
| Marketing consultant: "We had a problem with one of our major customers: business trips from Paris to Le Marche are complicated. By using a virtual fitting, we can work in real-time and remotely. In this way, the customer is more focused, the interaction is fast and intense. This helps a lot when trying to translate customers' needs into a prototype and a product." | Alpha enhanced customer contacts and interactions |
| Owner: "We needed to invest in new digital technologies also to improve the customer relationship. Travelling from Paris is complicated. Our geographical location became a risk. [...] With virtual fitting, they need two business trips per year instead of six, saving both time and mental stress." | |
| Marketing consultant: "Our B2B customers are well-known brands with a long history as well as new startups of emerging designers. For example, we worked with a young Nigerian girl whose successful business addresses the African luxury market. A young Tunisian customer carried out a similar project in the United States." | Alpha acquires new customers alongside traditional B2B customers |

5. Discussion and proposition development

Study findings show how the ACAP enables a DS process driven by the adoption of I4.0 technologies (Fig. 2). Hence, the more effectively the firm can explore, transform, and exploit external valuable knowledge (Lane *et al.*, 2006), the higher the likelihood to leverage I40 technology to its fullest potential, thus overcoming the digitalization paradox through DS. Accordingly, drawing on the identification of such a role, the study offers propositions to guide future research.

Fig. 2: The role of absorptive capacity in digital servitization



Source: authors' elaboration

P1. The firm's ACAP appears to strengthen the relationship between I.40 adoption and DS.

Although external knowledge searches have become increasingly important for firms, knowledge transformation, and exploitation are also vital to effectively embarking on a DS process and unlocking the value of digital technologies to innovate the BM. It is not just the potential ACAP (i.e. acquisition and assimilation of knowledge) that drives BMI (Miroshnychenko *et al.*, 2021). Still, all three learning processes (i.e. acquisition, transformation, and exploitation of knowledge) contribute to DS.

Notably, the firm performs exploratory learning by identifying and gathering new external knowledge regarding customers' needs and requirements through 3D technology as it steadily interacts and exchanges information with them. In this regard, increased contacts enhance access to customer's knowledge (Chichkanov, 2021). However, 3D technologies not only improve the intensity and the speed of the firms' efforts to identify and collect knowledge which determines the quality of a firm's acquisition capacity (Zahara and George, 2002), but the firm shows a capability to recognize the value of new external knowledge which represents an

important component of ACAP because “seeing” or “understanding” the potential of the new external knowledge is not automatic (Todorova and Durisin, 2007). In this regard, the 3D rendering itself is acknowledged and used as key information on customers’ needs, to guide the product design and production process effectively and efficiently. Thus, we propose the following:

P1a. Exploratory learning by identifying, gathering, and recognizing the value of external knowledge is likely to enhance the relationship between I4.0 adoption and DS.

An embedded knowledge base and existing capabilities often prevent firms from identifying and absorbing valuable external knowledge (Kraz *et al.*, 2016; Todorova and Durisin, 2007). In this regard, we show that the firm has developed routines and processes to assimilate and interpret this valuable information (i.e. transformative learning) (Gebauer *et al.*, 2012; Lane *et al.*, 2006). Specifically, the firm combines prior knowledge (Paiola *et al.*, 2021), namely established knowledge and expertise about products and customers, with the newly acquired knowledge about customers’ needs. This is valuable to assist the customer during the design process and translate its requirements into concrete product features, thus providing value-added consultancy services. Hence, firms need to look beyond their boundaries for external sources of knowledge to renew their knowledge, but most importantly they need to complement it with internal experience and resources to be able to develop more innovation (Saiz *et al.*, 2018). Such transformative learning also occurs through the development of knowledge-sharing mechanisms between organizational departments by coding relevant information into digital format. These organizational mechanisms associated with cross-functional interfaces and cooperation activities are central to the firm’s ACAP (Jansen *et al.*, 2005; Saiz *et al.*, 2018). Notably, digital data that indicate prototypes and product features that fit the customers’ requirements represent formal social integration mechanisms that facilitate the distribution of information within the firm as well as gathering interpretations (Zahara and George, 2002). This allows the assimilation of valuable knowledge that would not be otherwise stored and internalized. In doing so, the organization converts the acquired external knowledge into organization-specific knowledge (Lane *et al.*, 2006; Schlagwein and Hu, 2016; Yaun *et al.*, 2022). Hence, the ease with which information can now be edited, updated, and searched supports the assimilation, analysis, and reactivation of relevant knowledge in the organization.

In addition, such transformation of the acquired external knowledge into actionable knowledge for the organization’s operations relates to a more intense collaboration and knowledge flow with external firms such as suppliers and partners. In fact, through such strengthened relationships, the firm refines and complements the acquired knowledge to develop marketing-related knowledge about product customization.

Study findings show that firms without the capability to combine and share internal and external knowledge into actionable knowledge can only

be product manufacturers and sub-suppliers, completely dependent upon customers. In this scenario, the adoption of I4.0 technologies can simply result in the so-called digitalization paradox. Thus, transformative learning processes are pivotal for strategic innovation (Gebauer *et al.*, 2012). Notably, the following proposition can be developed on these grounds:

P1b. Transformative learning through combining prior knowledge and new external knowledge, and sharing such knowledge between departments and across firms, is likely to enhance the relationship between I4.0 adoption and DS.

Finally, the firm effectively employs the assimilated knowledge to develop new capabilities (knowledge output) (Lane *et al.*, 2006; Zahara and George, 2002). In this regard, customer-needing interpretation capabilities (Coreynen *et al.*, 2017) appear pivotal to developing and offering a bundle of value-added advisory services regarding product design (commercial output) (Lane *et al.*, 2006; Zahara and George, 2002). In doing so, exploitative learning mechanisms are triggered (Lane *et al.*, 2006) as the assimilated and shared knowledge is successfully leveraged toward a useful end. Considering this, we can develop the following proposition:

P1c: Exploitative learning through leveraging the assimilated knowledge for developing new capabilities and offering value-added services is likely to enhance the relationship between I4.0 adoption and DS.

6. Implications

6.1 Theoretical implications

The study primarily contributes to the DS literature by shedding light on the factors that enable such processes in an I4.0 context. Such a contribution is formulated as propositions for further academic and managerial consideration. Specifically, innovating the BM from product-centric to service-centric may help companies to overcome the so-called “digitalization paradox” and unlock the value of digital technologies (Coreynen *et al.*, 2017; Tronvoll *et al.*, 2020). Yet, studies on DS are largely conceptual (Tronvoll *et al.*, 2020; see also Kohtamäki *et al.*, 2019), and there is a lack of thorough understanding of its enabling factors (Coreynen *et al.*, 2020). Thus, we provide empirical evidence on the mechanisms through which the deployment of I4.0 fosters DS by arguing that the mere adoption of digital technologies is not sufficient for such a transformation (Bortoluzzi *et al.*, 2020). Organizational ACAP, namely a particular type of dynamic capability (Zahara and George, 2002; Miroshnychenko *et al.* 2021) of exploring, transforming, and exploiting new knowledge (Lane *et al.*, 2006), is needed to leverage the potential of these technologies.

Hence, by showing that ACAP may positively affect the relationship between I4.0 and DS, we extend the evidence of the influence of organizational dynamic capabilities (Coreynen *et al.*, 2017; Paiola *et al.*,

2021), thus answering previous calls on the role of such capabilities in DS (see Kohtamäki *et al.*, 2019). Recently, Paiola *et al.* (2021) shed light on the role of prior knowledge in DS. We add to these findings by showing that ACAP, including both prior knowledge and new knowledge, might help DS. Furthermore, this study adds to the extant empirical knowledge by extending the DS research focus to under-investigated digital technologies, such as 3D technologies (see Paschou *et al.*, 2020), other than the largely examined IoT (Paiola, 2018).

Additionally, we contribute to the KM literature calling for empirical research on the concept of ACAP (Ardito *et al.*, 2021; Chichkanov, 2021). Notably, the extant KM literature has focused on understanding the relationship between ACAP and innovation (e.g. Chichkanov, 2021; Tseng *et al.*, 2011; Xie *et al.*, 2018) and knowledge transfer processes (e.g. Dell'Anno and Del Giudice, 2015). We adopt an original perspective by investigating the role of ACAP in DS and show the relevance of managing prior knowledge and new customer knowledge for this type of BMI. In doing so, we also offer empirical support to extend prior research suggesting that ACAP is valuable to learn, develop, and assimilate new I4.0-related knowledge (Ardito *et al.*, 2021). Hence, we answer calls for studies regarding BMI from a KM perspective (Chen *et al.*, 2021). By employing Lane *et al.*'s (2006) conceptualization of exploratory, transformative, and exploitative learning, we provide conceptual clarity to show how ACAP might support DS and help in overcoming the digitalization paradox. We decompose the process of knowledge ACAP and identify the role of each dimension in facilitating DS.

Finally, the study findings also provide contributions to the literature on ACAP which lacks empirical evidence and mostly identifies ACAP with knowledge content (e.g. patents, R&D expenditures, etc.) (Zahara and George, 2002). We provide empirical support for the relationship between knowledge ACAP and organizational innovation and further develop the research by embracing an updated conceptualization of ACAP as exploratory, transformative, and exploitative learning. Moreover, studies on ACAP have largely focused on R&D contexts (Cohen and Levinthal, 1990). By linking the concepts of ACAP and BMI, we extend the current perspective beyond the R&D department to encompass the overall organization and its business logic.

6.2 Managerial implications

Traditional manufacturing companies can better understand how to overcome the digitalization paradox in I4.0 contexts. To this end, servitization and digitalization appear to be mutually beneficial. Servitization is indeed a feasible path for creating and appropriating value from digitalization in manufacturing companies, while digital technology increases the strategic and operational effects of servitization.

It is important to note that managers should acknowledge that the relationship between the two can be positively influenced by organizational ACAP. Specifically, the study shows that entrepreneurs and managers should not only encourage investments in digital technologies, but also become

aware that the transformation towards DS may be enabled by exploratory, transformative, and exploitative learning processes, which should be equally emphasized. In this regard, managers should promote and support the use of digital technologies for the acquisition of external customer knowledge. However, such knowledge becomes valuable once integrated with the prior available knowledge and properly assimilated within the organization. Hence, managers should increase coordination capabilities to support sharing mechanisms by implementing cross-functional and cross-firm interfaces. To enhance the assimilation of knowledge, in addition to informal sharing mechanisms, managers should also encourage the development of routinization through the use of formal documents (e.g. digital data sheets) which facilitate the distribution of information within the firm. Otherwise, relying only on informal mechanisms may jeopardize the internalization of valuable knowledge which can then be lost over time.

The developed knowledge can be then leveraged to create new capabilities and value-added services which allow the firm to appropriate value by enhancing its bargaining power and expanding its market.

7. Conclusions and future research

Firms that experience the digitalization paradox can achieve the expected results from their investments in digital technology by developing dynamic capabilities to leverage cutting-edge technologies to innovate BMs. In this regard, manufacturing companies may use digital technology to embark on DS, thus shifting from product-centric to service-centric BM. Notably, this study provides insights into the role of ACAP as a dynamic capability that can help such a process by exploring, transforming, and exploiting external valuable knowledge.

Yet, as in the case of any research, our study design is subject to limitations, some of which offer opportunities for scholars to expand upon our findings.

First, although single case studies can thoroughly describe a phenomenon and generally allow for more detailed descriptions, this approach suffers from limitations related to the external validity of results. Hence, conducting a multiple case study may overcome such limitations and clarify whether an emergent finding is simply idiosyncratic to a single case or consistently replicated by several cases, thus providing a stronger base for theory explanation (De Massis and Kotlar, 2014; Eisenhardt, 1989). We provide propositions that can be tested in future research to assess the transferability of our findings across industries and contexts.

Second, data collection is primarily based on four semi-structured face-to-face interviews with key informants. Although we used additional data sources, such as on-site visits and archival data, to triangulate findings, increasing the number of interviews and collecting data from other actors (i.e. customers, suppliers, and partners) would be beneficial to gain a more holistic view.

Third, the study is focused on the firm's ACAP to explore, transform, and exploit customer knowledge. Future studies may extend the research

findings to other sources of external knowledge (e.g. competitors and partners) and their role in influencing DS processes. Moreover, future research could address additional factors (e.g. other dynamic capabilities) which might interplay with ACAP in DS.

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Digital servitization as
Business Model Innovation:
an explorative study on the
role of absorptive capacity

sinergie

italian journal of management

ISSN print 0393-5108
ISSN online 2785-549X
DOI 10.7433/s122.2023.04
pp. 71-93



Italian Society of
MANAGEMENT

The intelligent use of Twitter ecosystems by destination management organisations

Received
13th December 2022
Revised
4th April 2023
Accepted
14th November 2023

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Abstract

Frame of the research: *The recent literature on social media adoption by DMOs identified a lack in the strategic utilization of social media for user-generated content and positive communication as well as for destination brand co-creation and relationship management. In particular, social media's use as a destination knowledge management tool is still a largely unexplored topic and so a novel and promising area of research.*

Purpose of the paper: *The paper investigates the intelligent exploitation by destination management organisations of Twitter to enhance destination knowledge management and value creation. The paper combines analysing the content communicated and shared in the business-to-consumer and the business-to-business Twitter ecosystems and the influential players that shape the knowledge conveyed in these environments. Additionally, the paper explores the impact of the Covid-19 pandemic on content. The joint analysis of these aspects is original and relevant.*

Methodology: *The analysis combines traditional content analysis, modern topic modelling and social media metrics using the specific case of Tourism and Events Queensland (TEQ), the state-level DMO in Queensland, Australia.*

Findings: *The analyses of the two Twitter ecosystems managed by TEQ have shown that each environment has its own knowledge domain and distinguishing characteristics in terms of variety and representativeness of stakeholder categories. The business-to-customer ecosystem primarily serves as a platform for destination marketing knowledge, while the business-to-business ecosystem is more oriented towards destination management knowledge, although less exclusively. The ties between the two are very strong. A handful of influential promotional players have a strategic role in both ecosystems and, crucially, in connecting the business-to-consumer and business-to-business environments.*

Research limits: *The paper deals with a single case study with destination-specific characteristics. To draw broader conclusions, further extensive case study analyses on an international scale and covering various DMOs and social media tools are necessary. Longitudinal evaluation studies are also needed to assess the paths taken in terms of stakeholders engaged, themes covered, and tools used by DMOs.*

Practical implications: *Despite social media having been shown to transfer the locus of knowledge to "the many", e.g., social media users, primary actors continue to exert ownership and control over knowledge. A particular intelligent agent's active management, i.e., promotional players, including the DMO itself, plays a strategic role in shaping the knowledge generated within and across the Twitter ecosystems. DMOs must act as responsible intelligent agents making decisions and taking actions based on common values to sustainably create collective knowledge and value by harnessing Twitter's potential in both business-to-business and business-to-consumer environments.*

Originality of the paper: *This paper's novelty lies in its comprehensive examination of Twitter use by DMOs in both the business-to-consumer and business-to-business ecosystems and the key players influencing or seeking to influence content within these environments. While existing literature has addressed these issues separately, mainly focusing on the business-to-consumer ecosystem for marketing purposes, this study offers a holistic perspective needed for DMOs to responsibly take the role of intelligent agents in an era characterised by widespread access and participation in value generation and sharing.*

Key words: DMO; digital business ecosystem; social media; Twitter; destination knowledge and value; influential players

1. Introduction

The concept of the digital business ecosystem (Karhu *et al.*, 2011) captures the emergence and embodiment of new collaborative value creation networks that can allow destination management organisations (DMOs) to exploit digital platform potential successfully. These networks present a promising avenue for destination management organisations to effectively harness the potential of digital platforms. Within these digital ecosystems, various stakeholders, encompassing the socio-economic context, institutional entities, and regulatory actors, are strongly interconnected. This interconnectedness amplifies the possibilities for collaboration, competition, innovation, knowledge sharing, and the evolution of business models and adaptive technologies, in alignment with the insights put forth by Zott *et al.* (2010). The creation of their own digital business ecosystems has profoundly changed the role of DMOs from a primary and often exclusive emphasis on place marketing to a more complex set of management responsibilities. The notions of the knowledge-based organisation (Racherla *et al.*, 2008), network manager (Volgger and Pechlaner, 2014) or intelligent agent (Sheehan *et al.*, 2016) all identify the evolving role of the DMO as a body aiming at effective and efficient knowledge management to address threats and opportunities arising within their highly competitive environments.

Their connectivity, data capabilities and smartness (Sigala, 2018) make social media relevant, indeed dominant, digital business ecosystems and one of the main market intelligence sources for destination decision-making (Miah *et al.*, 2017), knowledge management (Bilgihan *et al.*, 2016) and destination marketing (Giannopoulos *et al.*, 2022). Significantly, social media visual content and narration message appeal have shown an increasing role in enhancing destination imagery (Gan *et al.*, 2023). Despite DMOs having integrated these networks of interconnected stakeholders into their management and marketing strategies (Jabreel *et al.*, 2016; Kumar *et al.*, 2022), their potential as knowledge management tools has not yet been fully exploited (Cabiddu *et al.*, 2014). A recent systematic literature review on social media adoption among DMOs (Shah Alizadegan and Liu, 2022), identified the challenges that still need to be addressed including the lack of strategy, knowledge and resources.

Further knowledge is needed on “the strategic utilisation of social media for user-generated content and positive communication” and, significantly, “destination brand co-creation and relationship management”.

This is particularly true of Twitter, one of the top most-visited websites worldwide (Antoniadis *et al.*, 2015) and the most popular microblog for current personal and public communication (Tenkanen *et al.*, 2017). As demonstrated in cases such as crisis communication - the COVID-19 pandemic (Morgan *et al.*, 2021), other global health crises or terrorist attacks (Barbe *et al.*, 2018; Oliveira and Huertas-Roig, 2019), Twitter’s strength lies in its short and flexible messages (Smith and Brenner, 2012), the short time lags of its updates (Khondker, 2011), intense end-user interactions, and creative content generation (Juntunen *et al.*, 2019). The platform is increasingly serving business communication (Nicolau *et al.*, 2020) and marketing strategies (Soboleva *et al.*, 2017) and its popularity is growing in tourism and destination management organisations (Ćurlin *et al.*, 2019).

The platform’s use as a destination knowledge management tool and how DMOs can best exploit their Twitter digital ecosystems are still largely unexplored topics and thus remain a novel and promising area of research (Solazzo *et al.*, 2022). Most studies done in the destination domain focus on Twitter network configurations (Bokunewicz and Shulman, 2017) and the content conveyed on them (Sevin, 2013). However, the literature addresses these critical issues separately, mainly in the business-to-consumer environment and for marketing purposes. Notably, an analysis of the Twitter networks of 14 DMOs (in large US cities) (Bokunewicz and Shulman, 2017) showed that individual, media, and promotional accounts are the most influential on Twitter. However, to determine the account types, only the top 10 most influential accounts in the 14 DMO networks were analysed without explicitly distinguishing between the business-to-consumer and the business-to-business environments and focusing implicitly on the former. Studies on DMOs’ Twitter use (Gibbs and Dancs, 2013) and Twitter communication in business-to-consumer and business-to-business accounts (Swani *et al.*, 2014) showed that the specific Twitter environment affects the content communicated.

From both theoretical and empirical perspectives, combining the analysis of the use of Twitter by DMOs in terms of the content communicated and shared in the business-to-consumer and the business-to-business environments and the key players that have most influence or are seeking more influence on content in them, is significant and relevant. These joint aspects shed light on the evolving role of DMOs as intelligent agents using Twitter for this purpose. Accordingly, this paper investigates Twitter’s exploitation by a DMO to enhance destination knowledge management and value creation. The paper has been designed to answer these questions: 1) What does the content communicated and shared within the DMO’s Twitter ecosystem mainly consist of? 2) Who are the influential players that significantly shape the knowledge conveyed in the ecosystems? 3) How is the Covid-19 pandemic influencing the DMO’s Twitter ecosystem?

By integrating advances in qualitative and quantitative research on aspects of the social media digital business ecosystem and Twitter use in

the destination domain, the answer to the research questions is developed by combining social media metrics with traditional content analysis techniques and modern topic modelling using the specific case of Tourism and Events Queensland (TEQ), the state-level DMO in Queensland, Australia. The analyses of the two Twitter ecosystems managed by TEQ have shown that each ecosystem has its own knowledge domain and distinguishing characteristics in terms of variety and representativeness of stakeholder categories. While social media platforms have been observed to shift the focus of knowledge towards the broader user base, “the many” (Munar, 2012), it was evident that primary actors continue to exert ownership and control over the process of knowledge generation and sharing. In fact, the active management of a specific intelligent agent, including promotional actors like destination management organisations (DMOs), plays a pivotal role in shaping the knowledge that emerges within and extends across Twitter ecosystems. This study not only highlights this phenomenon but also paves the way for new avenues of research that centre on DMOs as essential intelligent agents. These agents are responsible for utilising Twitter ecosystems in a sustainable manner to manage destination knowledge and foster value creation within diverse digital environments.

2. Literature review

2.1 The DMO's digital business ecosystem: social media relevance

DMOs involve and coordinate all the elements that form a destination in an open and flexible system of interdependent multiple stakeholders (del Mar Gálvez-Rodríguez *et al.*, 2020). Accordingly, DMOs design strategies to manage created value and foster value creation through collaboration, sharing and trust (Cabiddu *et al.*, 2013). The digital business ecosystems fostered by digital innovations reposition destination value creation on the physical-virtual continuum (Senyo *et al.*, 2019), by putting a socio-economic community of individuals and organisations in a virtual environment. These new organisational networks collectively create value through collaborative and competitive multi stakeholder participation and interaction on shared digital platforms.

Social media platforms are the strategic digital business ecosystem most frequently used by DMOs for multiple purposes (Mariani *et al.*, 2018). They include, among others, network relationships, strategies and process management, knowledge development, dissemination and management and value co-creation. Reshaping real and virtual destination relationships (Baggio and Del Chiappa, 2014), reengineering destination functions (Zeng and Gerritsen, 2014) - including marketing (Felix *et al.*, 2017), image making (Stojanovic *et al.*, 2022) and branding (Buhalis and Sinarta, 2019) - engaging customers (Lee *et al.*, 2021) and fostering knowledge creation, dissemination and management to promote continuous innovation leverage social media connectivity, data capabilities, and smartness (Sigala, 2018). Moreover, they exert influence over perceptions and behaviours (Elshaere *et al.*, 2022; Philander and Zhong, 2016).

Destination knowledge management has been recognised as an important addition to collective destination value creation via social media that needs further investigation (Shah Alizadegan and Liu, 2022). It relies on strategic planning and decision making and communication (especially electronic word-of-mouth, Ćurlin *et al.*, 2019) highlighting trending topics and popular sentiments (Kumar *et al.*, 2022) and identifying opinions and beliefs about products, experiences, and brand reputations (D'heer and Verdegem, 2015) for experience design (Gon, 2021). Destination value co-creation via social media greatly benefits from the network structure (Del Chiappa and Baggio, 2015), the variety of stakeholders involved (Ruhanen *et al.*, 2021), and strong pro-active interactions when these blend market, commitment, trust, and positive emotions (Munar, 2012).

In order to offer relevant and context-aware knowledge while fostering collective value, DMOs must tap into the potential of social media. This entails the identification and adoption of suitable tools for gathering, sifting, extracting, and processing the extensive array of data, often in a variety of formats, as well as the content generated and shared within these ecosystems, as emphasised by Trunfio and Della Lucia (2019). The principal metrics regard the community's size, the volume and nature of the content generated by DMOs and users (links, text, photos and video), the interactions generated by content (comments, shares and likes), and the response time (how fast users react to actions or interactions) (Socialbakers, 2015). In addition to knowing the community's size, the DMO must understand the ties and positions of connected players within the network to gauge whether its digital ecosystem is effective for destination purposes (Bokunewicz and Shulman, 2017).

These social media metrics are complemented with content analyses supported by computerised applications to detect contextual information, i.e., hidden semantic structures in a text body (Trunfio and Della Lucia, 2019). Despite their differences - e.g., inductive vs deductive approaches, dimensions of corpora, data sampling techniques and outputs - Zhang and Wildemuth (2005, p. 2) suggest that "qualitative and quantitative analyses are not mutually exclusive and can be used in combination". Recent studies have shown that their outputs are similar, and their differences complement rather than contradict each other (Lee *et al.*, 2022; Pareschi and Mollona, 2020). Achieving success in these processes is challenging given the diversity of social media ecosystems and the interconnected players that wield most influence within them (Bokunewicz and Shulman, 2017).

2.2 *The DMO's Twitter ecosystems: opportunities and challenges*

Twitter is an open, public social media platform, and one of the world's most used for personal, public, and business communication (Jin and Cheng, 2020). The tourism industry's use of Twitter for marketing purposes has increased dramatically in recent years for promoting tourist products and services, influencing attitudes and perceptions, answering guests' requests, managing complaints and shedding light on tourists' decision-making processes (Ćurlin *et al.*, 2019).

The increased sophistication of Twitter's tools and DMO's growing capacity to exploit these tools have extended the platform's use to destination management and marketing. Its usage includes destination image making and branding (Revilla Hernández *et al.*, 2016; Sevin, 2013; Uner *et al.*, 2023), the development of strategies and trend forecasting (Curlin *et al.*, 2019), the promotion and monitoring of tourist attractions and services (Jin and Cheng, 2020), the study of people's value, opinions, intentions, and behaviours (Alaei *et al.*, 2023; Becken *et al.*, 2020) and the investigation of the movement of visitors (e.g., during big events; Cheng *et al.*, 2023). Destination stakeholder engagement in real-time through communication, education, outreach efforts and knowledge sharing remains an important application of this platform (Sevin, 2013). As demonstrated by a literature review on Twitter usage in tourism and destination management (Curlin *et al.*, 2019), crisis communication is an emerging use. Due to its features, Twitter has played a crucial role in destination management and marketing not only during (and after) the COVID-19 pandemic but also in other catastrophic events (e.g., hurricanes, snowstorms, earthquakes and terrorist attacks) (Oliveira *et al.*, 2019) and destination event crises (Morgan *et al.*, 2021). Gibbs and Dancs (2013) emphasised that the advances of Twitter's tools and their use by DMOs are shifting this social media from information sharing to information seeking, thus creating opportunities to exploit Twitter's interactive potential for knowledge management and collective value generation.

The key Twitter features that prompted this development were its asymmetric follower model (open and public communication) and its reaction mechanism (retweet and # hashtag) to content (Tweet) (Jin and Cheng, 2020). Retweeting someone by reposting @ (suffix with name) multiplies shared conversations (Brandt *et al.*, 2017); liking another person's tweet simply manifests interest and participation but does not directly activate a conversation. When tweets address specific users (i.e., mention), these mentions are also shared. The power of retweets to spread information far and wide makes - potentially all - users peripherally aware of conversations, even if they do not participate in them (Boyd *et al.*, 2010). Information spreads beyond the reach of the original user's followers as the potential audience does not need to give mutual approval to follow or become a follower. The information is available for anyone to read, whether logged into Twitter or not. In addition, using the hashtag symbol (#, suffix with word) before a relevant keyword or phrase in a tweet is a selection strategy that allows content to be categorised and topics to be shown more easily in subsequent searches (Philander and Zhong, 2016). A community of followers commenting on specific Twitter content usually clusters around the hashtag, linking all the tweets that include it (Small, 2011). Meta-hashtags are the most popular hashtags within a set of associated hashtags (Rocheleau and Millette, 2015). They become markers of both the content and related data (Brun and Burgess, 2013) making it easy to reach a wide audience. By contrast, if hashtags are not used, it is hard for the community to access online information. For example, tourists cannot access relevant online content, especially if they do not follow the DMO's account (MacKay *et al.*, 2017).

The features that make Twitter a powerful tool for multiple potential purposes are also potentially problematic to the DMOs endeavouring to understand and exploit its effectiveness for knowledge management and collective value creation (Jin and Cheng, 2020). A destination's Twitter ecosystem is complex and spans both the business and the consumer environment and thus includes heterogeneous stakeholders, all of whom have diverse ranges of geographical reach, roles and influence. Twitter metadata (user profile, Tweet geo-tag, time, and interaction data) are publicly available (de Bruijn *et al.*, 2018) and Twitter users' time-span information can be extracted without violating their privacy (Hasan and Ukkusuri, 2015). However, the high volume, variety and continuous updating of Tweets makes it hard to extract effective information and it is costly, time-consuming, and almost impossible to do manually. Consequently, DMOs are quite often unable "to extract much objective quantitative feedback or establish competitive benchmarks from this available data" (Philander and Zhong, 2016, p. 16). Moreover, the network's scope and the influence of key players shape content and impact the retweeting and mentioning processes (Jin and Cheng, 2020). However, Twitter users do not represent the general population, and Twitter posts do not necessarily represent the whole Twitter user base (Boyd and Crawford, 2012).

Advances in quantitative and qualitative research have been made with regard to a variety of specific issues, but further research is still needed to provide a comprehensive understanding of the use and potential of Twitter (Solazzo *et al.*, 2022). For example, Gretzel *et al.* (2015) classified Twitter's stakeholders according to their role (i.e., residential consumers, tourists, DMOs, tourism suppliers, suppliers from other industries, government agencies and intermediaries). They pointed out that these categories are not necessarily mutually exclusive, as a single actor can play more than one role. Bokunewicz and Shulman (2017) investigated both tourism suppliers and suppliers from other industries and identified the accounts that exerted the most influence on content generation and sharing. Antoniadis *et al.* (2015) analysed the Twitter networks of 38 European DMOs and found that Twitter networks function more like information boards than connected community members mentioning and replying to each other. However, a content analysis of Canadian DMOs' Twitter use, carried out by Gibbs and Dancs (2013), found that Twitter usage underwent a transformation, shifting its focus on seeking information and sharing content related to friendships and relationships.

3. Research design

3.1 *Tourism Events Queensland*

Queensland, an Australian state covering the continent's northeast with a coastline stretching nearly 7,000 km, is a world-class location for tourism, offering cosmopolitan cities, beaches, outback locations with wildlife and country towns. Prior to the COVID-19 pandemic, Queensland was the third Australian state for visitors (22 million of which 20.4 million were

domestic) and tourism receipts (A\$20 billion) and the tourism industry accounted for 7.7% of the national GDP (\$28.4 billion) (Tourism Research Australia, 2019). According to forecasts, Queensland's tourism and events sector had the potential to generate around \$33 billion by the year 2025; much of the growth was expected to originate from international markets (Tourism and Events Queensland, 2022).

The closure of Queensland's borders from 20 March 2020 to the end of 2021 - and, significantly, its largest domestic source markets (New South Wales and Victoria) - severely impacted the tourism economy. Still, tourism employment decreased at a slower rate, due to the support measures put in place. In the last years other crises also affected the state, such as a "record flooding and rain across South-East Queensland in March 2022 that impacted consumer confidence in travelling to Queensland" (Tourism and Events Queensland, 2022, p. 10) or the war in Ukraine. Nonetheless, the tourism industry has shown encouraging signs of recovery as it adapted to new travel trends and preferences, and the recovery was faster for international leisure rather than international business (Tourism and Events Queensland, 2023).

Tourism and Events Queensland (TEQ) had a major role in this tourism recovery. This case study (Eisenhardt, 1989) provides for a critical evaluation of the intelligent use of social media, such as Twitter, for this purpose. The state's quasi-governmental organisation aims to "achieve economic and social benefits for Queensland by growing the tourism and events industry in partnership with industry and broader government" (Tourism and Events Queensland, 2022). TEQ focuses on marketing and promotional activities (source markets, destination markets and aviation, business-to-customer) in collaboration with the tourism and events industry, and innovation-driven activities which involve researching and analysing big data on tourism in Queensland (business-to-business). It is particularly dynamic and active on social media with a well-developed presence (Hays *et al.*, 2013). TEQ's Twitter strategy is to have distinct consumer and trade environments: @Queensland (business-to-customer) targets travellers and @teqld (business-to-business) targets the tourism industry and businesses.

3.2 Methods

To elucidate the strategic use of Twitter by a DMO for advancing destination knowledge management and value creation, this paper integrates an examination of the content disseminated and exchanged within both the Twitter business-to-consumer and business-to-business ecosystems. Additionally, it performs an identification of influential actors who significantly shape the knowledge disseminated within these environments. In the process, this study delves into the profound effects of the Covid-19 pandemic on these ecosystems.

The research design is a two-step analysis drawing on advances in quantitative and qualitative research in the social media ecosystem (Senyo *et al.*, 2019) in the tourism and destination field and Twitter use for enhancing destination value creation (Jin and Cheng, 2020). It combines traditional content analysis and modern topic modelling (first step) with

social media metrics (second step). The thematic analysis is carried out on content conveyed in TEQ's communications encompassing both the consumer (@Queensland) and business ecosystems (@teqld), including also the impact of Covid-19 on these conversations. Selected social media metrics are used to identify the players exerting most influence on content or seeking knowledge conveyed in the ecosystems.

The research design focuses primarily on the Twitter ecosystems maintained by the DMO, specifically examining the content generated within both the business-to-business and business-to-consumer environments. This choice is driven by Twitter's inherent characteristics of open and public communication, which facilitates the rapid dissemination of information from the original user's account to a wide audience, regardless of whether they are logged into Twitter or not.

Given the research's DMO-centric perspective and its emphasis on one-way communication (i.e., from the DMO to the actors within its Twitter ecosystems), we opted not to incorporate mathematical and graphical techniques commonly utilised in social network analysis to study network structure and dynamics.

3.2.1 *Thematic analysis of content communicated in Twitter ecosystems*

The themes communicated and shared within each Twitter ecosystem were analysed by combining a traditional qualitative analysis performed using Nvivo and a quantitative one performed using automated topic modelling (TM). The former is mainly inductive, "grounds the examination of topics and themes in the data" (Zhang and Wildemuth, 2005, p. 1) and uses different approaches (conventional, directed, or summative) (Hsieh and Shannon, 2005). Nvivo is a well-established software package for qualitative analyses of relatively large corpora: the software searches data elements by identifying the portions of data that contain them and then providing several possible representations. Nvivo effectively detects main content categories and enables researchers to identify 'unique themes that illustrate the range of the meanings of the phenomenon' (Zhang and Wildemuth, 2005, p. 2). However, it is less efficient if required to deal with very large quantities of text as detection and identification must be performed manually.

Quantitative content analysis is deductive and involves the automated discovery of main topics in large corpora; its validity relies on random sampling or other probabilistic approaches. TM is an unsupervised text-mining tool (Lee *et al.*, 2022) which uses a modelling algorithm to detect the most common words and statistical patterns in a corpus and then automatically cluster these words in groups/topics. The most reliable modelling algorithm, the Latent Dirichlet Allocation (LDA) (Eickhoff & Neuss, 2017), is well-suited for application to short texts like Tweets (Albalawi *et al.*, 2020). Based on a hierarchical Bayesian approach, it identifies a series of topics in order of importance. Topic importance is evaluated using the frequency of a word and an estimation of the probability that it is associated with a particular topic. The common practice is to perform several trials with different topics and then choose the best number (the

number with the highest coherence) (e.g., Isoaho *et al.*, 2021). The metric used to retain or discard topics is the average value of the (normalised) coherence scores - the semantic similarity of the most frequent words in the topic. For each account, the similarity (Hellinger distance) between topics - the probability distributions of the words describing each topic - is used to connect the topics and identify the core and peripheral ones. The core topics are the most important - the most central and densely connected sets of elements in a network.

3.2.2 *Key players exerting most influence on and/or seeking knowledge conveyed in the Twitter ecosystems*

As common applications of social network analysis techniques were excluded from our study, well-established social media metrics - community and interaction - were used to identify the key players in each TEQ's Twitter digital ecosystems. A distinction was made between the accounts that follow the DMO's Twitter ecosystems (number of followers), i.e., the community metric, and the single users that the destination management organisation involves in its Twitter conversations, i.e., the *interaction* metric. When possible, all community members (followers and the mentioned single users) were also geocoded at the country level. Twitter account holders do not have to provide this information, so it may be missing and sometimes inaccurate.

The mentioned single users have been regarded as the key actors of the DMO's Twitter ecosystems. Due to the DMO-centric perspective of this research and the one-way conversation, the key actors include the accounts directly mentioned by the DMO. Due to Twitter's open and public communication features, they also include the mentioned accounts that may not be @Queensland's or @teqld's direct followers but whose information is being transmitted directly to TEQ (Retweet). In each ecosystem, the most frequently mentioned single users have been regarded as the most *influential actors*. The representativeness of the mentioned single users has been identified by classifying their role according to Bokunewicz and Shulman's (2017) stakeholder categorisation. In order to cover the variety of actors that the Twitter digital business ecosystem encompasses, this classification was integrated with new categories, i.e., politicians (the premier minister, ministers, members of Parliament and councillors) and regulators of social and environmental domains (institutions, organisations, and associations). Finally, the influence of the five most influential players/categories on the content communicated in the two ecosystems was analysed to connect the analysis of topics with the ecosystems' configuration in terms of key players.

3.2.3 *Data collection and analysis*

Publicly available data on the Twitter community (follower size, profile, and, when possible, geolocation), content (tweet volume and text content generated by the DMO), and the interactions generated by content, were extracted from TEQ's official Twitter accounts (@Queensland and @teqld).

The period covered is January 1, 2019 to May 30, 2022. Within this time, the period up to June 2020 preceded the increase in COVID-19 cases in Australia. All data were collected through Twitter API using the Tweepy Python library (Roesslein, 2020). Texts (Tweets) generated by the DMO and its retweets for the two accounts were kept separate and were cleaned by identifying words of interest (tokenization), removing punctuation and common terms (stop-words), and normalising and standardising the terms contained in the texts by transforming all inflected words into their basic forms (lemmatization).

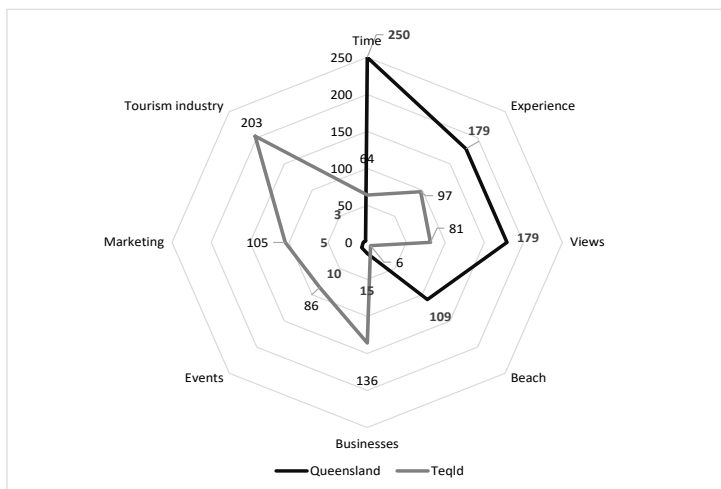
The qualitative content analysis carried out using NVivo 12©1999-2019 used QSR International's auto-code function (lexical analysis) to identify the main themes that group stem words. Synonyms were also manually coded after the text-word searches and matrix-coding comparisons because different parts of a single tweet are sometimes coded to more than one theme. The quantitative analysis was carried out on the same corpus using a machine learning topic modelling (TM) method.

The LDA modelling algorithm extracted and clustered sets of topics and listed the words that most probably belong to each one. The method converged into 20 topics corresponding to coherence scores of 0.456 for Queensland and 0.415 for Teqld, the highest value obtained in the different attempts; calculations were carried out using the Gensim Python package (Řehůřek and Sojka, 2010). The algorithm Gallagher *et al.*'s (2021) Python scripts - an updated and optimised version of Borgatti and Everett's (2000) well-known procedure - were used to perform a network analysis of topics; the 80th percentile was used as the cut-off for defining a link between two topics. Eight main topics were identified for each account, labelled, and compared to identify which themes were common to both accounts and which were unique to one.

Eight major themes that appear in both TEQ's Twitter ecosystems were revealed by comparing the results of the content analyses. Because of the similarity of results of the manual coding (Nvivo) and the network analysis of the topics identified by the LDA (TM), we chose to report the results of the qualitative analysis as they are more effective to illustrate the range of meanings in the Twitter conversations.

This choice is in line with Zhang and Widemuth's (2005) assessment that typologies and descriptions are the most effective way of conveying this information. The eight significant themes that appear in both Twitter ecosystems- time, experience, views, beach, tourism industry, businesses, marketing, and events - were associated with a theme score revealing their different degrees of importance in each ecosystem, i.e., the number of words/references counted in the theme groups for each Twitter account (Figure 1). Any additional themes that were unique to either of the Twitter accounts were identified and coded with manual cross-checking. Turtles and rainforest were found to be unique themes for @ Queensland and COVID-19 and Indigenous tourism were unique for @teqld (Table 4).

Fig. 1: The top eight themes in Tourism and Events Queensland's Twitter ecosystems



Source: our elaboration on TEQ Twitter accounts

Data on TEQ's Twitter ecosystems (community, content and interaction metrics) were collected using Tweepy, a known Python library. In the period examined, more than 3,000 tweets were posted in TEQ's Twitter ecosystems and these generated more than 83,800 interactions, mostly retweets. @Queensland produced more intense communication (2,186 vs 852 tweets) and interactions (79,812 vs 4,042) than @teqld and has a much larger community (165,892 vs 17,910 followers) (Table 1). @Queensland's followers are equally divided between international (30.1%) and domestic (27.6%), with 11.5% from Queensland itself. In contrast, @teqld's followers are mainly domestic (76.4%), and 36.81% are in Queensland (Table 5).

Tab. 1: Tourism and Events Queensland's Twitter ecosystem

| Tourism and Events Queensland accounts | Community | Content | Interaction | | |
|--|-----------|---------|-------------|--------|--------|
| | Followers | Tweets | Retweet | Like | Total |
| @Queensland | 165,892 | 2,186 | 52,596 | 27,216 | 79,812 |
| @teqld | 17,910 | 852 | 1,412 | 2,630 | 4,042 |
| Total | 183,802 | 3,038 | 54,008 | 29,846 | 83,854 |

Source: our elaboration on TEQ Twitter accounts

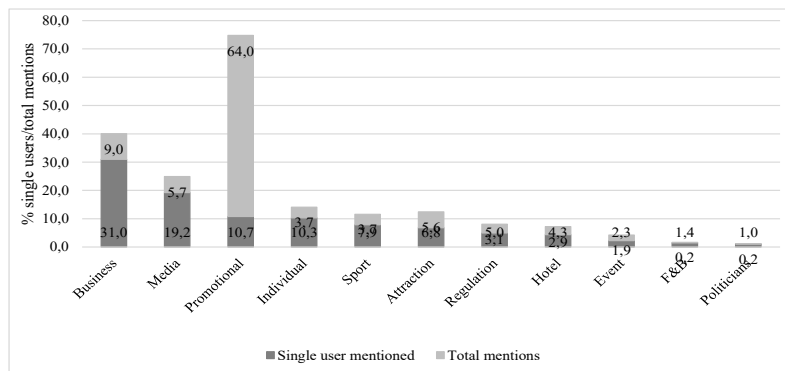
Moreover, the communities of the ecosystems were localised by extracting the location field in the Twitter profiles (less a small - 20% - percentage of empty or invalid values); the locations were classified into three categories (Queensland, Rest of Australia, International). The key players, i.e., single users mentioned on the business-to-consumer and the business-to-business ecosystems, were calculated using Excel on data on accounts collected using Tweepy. Their role - according to Bokunewicz and Shulman's (2017) detailed stakeholder categorisation with the addition of

new categories - was manually coded based on the names and a thorough analysis of the descriptions of their accounts.

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Descriptive statistics were used to analyse the representativeness and influence of single user categories in each TEQ's Twitter ecosystem (Figure 2 and Figure 3). Chi-Square statistical tests in R were performed to determine the statistical significance of the difference between the frequencies observed in the dimensions investigated (the representativeness and influence of single user category types) in the two ecosystems.

Fig. 2: Single user categories mentioned on @Queensland: representativeness and influence



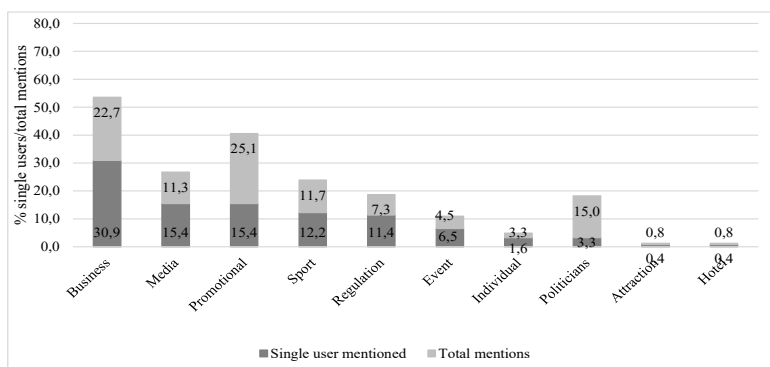
Footnote:

Single user mentioned: % of single users mentioned in tweets, quotes, replays, and retweets in @Queensland ecosystem per category type.

Total mentions: % of mentions a single user received on the total mentions counted in this ecosystem per category type.

Source: our elaboration on TEQ Twitter accounts

Fig. 3: Single user categories mentioned on @teql: representativeness and influence



Footnote:

Single user mentioned: % of single users mentioned in tweets, quotes, replays, and retweets in @teql ecosystem per category type.

Total mentions: % of mentions a single user category received on the total mentions counted in this ecosystem per category type.

Source: our elaboration on TEQ Twitter accounts

The scores of the themes covered by the top five accounts mentioned in both ecosystems were manually coded and cross-tabulated with the eight top-scoring themes. Descriptive statistics along with Lorenz curves and Gini coefficients (Fellman, 2012) were used to identify the concentration or dispersion of the top-scoring themes in the conversations generated in each ecosystem and to show the extent to which the top five accounts mentioned in the ecosystems and their related stakeholder categories, benefit from (and/or lead) the conversation around these themes. These tools are commonly used in tourism management and marketing studies to examine the factors influencing the issues analysed (Kronenberg & Fuchs, 2022).

4. Findings

The study provided an understanding of the significant themes discussed across TEQ's Twitter ecosystems including the subthemes unique to each one of them thus showing the effects of the Covid-19 pandemic on content. Moreover, it identified the key players (and their categories) exerting most influence, or seeking more influence, in the Twitter conversations. Findings are discussed, comparing the content disseminated on the two ecosystems and their connection to the two Twitter accounts' configurations with regard to their key players and influential categories.

4.1 *The most significant themes discussed within the TEQ ecosystems*

The eight major themes that appear in both TEQ's Twitter ecosystems and spark involvement in a digital conversation differ from one account to the other, with very little overlap (Figure 1). Time (250), experience (179), views (179), and beach (109) are the top-scoring themes in @Queensland and represent 96.5% of the conversation in this ecosystem. The reverse holds true for @teql: the tourism industry (203), businesses (136), marketing (105), and events (86) are the most important themes and together they represent 68.1% of the conversation generated in the business ecosystem. This is because three top-scoring themes in the business-to-consumer ecosystem - experience (98, i.e., 12.5%), views (81, i.e., 10.4%) and time (64, i.e., 8.2) - are also important in the business-to-business ecosystem. The distribution of the top-scoring themes, built by combining their frequency (x-axes) and their cumulative share (y-axes), shows that the conversation is not equally distributed among the eight themes. In both ecosystems, four (different) themes have the biggest share (Figure 4 and 5). The Lorenz curves and Gini coefficients show that the concentration is higher on @Queensland (Gini = 0.39) than in @teql (Gini = 0.29), as the themes are more evenly distributed on the latter.

Upon closer examination, the distinct focus of each ecosystem appears (Tables 2 and 3). On @Queensland, time can refer to the good times tourists have in Queensland, or to having more time to oneself, or to the different times (of the day, of the year) in which they can enjoy nature/wildlife and activities. Experience mainly relates to (terrestrial and marine)

native Queensland wildlife and how to get up close to them. Views is about what you can see in Queensland, and its beauty and value: the scenery and/or wildlife. Queensland beaches get their own theme, which includes beach names and the activities available at/near them (cricket, quad biking, swimming). Surprisingly, the urban component of the state’s tourism offers - Brisbane nightlife, sports stadiums, Gold Coast high-rises, etc. - is almost non-existent in the findings.

The subsequent Tweets serve as examples illustrating the thematic content communicated within the business-to-consumer ecosystem (Table 2), recalling good experiences, memories and feelings:

“We could sit and stare at the view all day” (Time - valuing time)

“Ready for your next selfcare? Let @VisitMackay take care of that for you; Tropo islands, lush rainforests” (Time - activity)

“Lucky guests on board @bluedolphintour witnessed two whales spy hopping” (Experience - native terrestrial and marine animals)

“You will never get tired of swimming with turtles.....ever!” (Experience - with animals)

“@HeronIsle in @gladstoneregion is home to incredible views, turtle hatchlings, research centres, incredible wildlife” (Views - beauty/values of views)

“There’s nothing quite like a Surfers Sunset” (View - natural lanscape)

“You can always count on Kirra Beach to have the clearest waters on the Gold Coast” (Beach - specific beaches)

Tab. 2: Top four themes in @Queensland

| Themes/score | Sub-theme and description |
|---------------------|---|
| Time (250) | Valuing time/having more time: beautiful days, days, lazy days, and nap time. Nature/wildlife/activity: turtle hatching season, mountain or island time, day cruises. Moments/seasons: cracking [excellent] daily dose of summer, day trips, Autumn and crushing seasons. |
| Experience (179) | Native terrestrial and marine animals: koala, kangaroo, dingo, butterfly, lorikeet, cassowary humpback whale, turtle, crocodile. Experience with animals: feeding, ‘getting up close and personal’, meeting, getting some shots, seeing in person. |
| Views (179) | Natural landscape/wildlife: beaches, ocean, skyline, valley, birds. Beauty/value of views: dreamy and unforgettable, glittering, idyllic, spectacular, stunning, sublime, sweeping skyline, night-time view, birds-eye view |
| Beach (109) | Specific beaches: Bullock, Dorilla, Bramston and Wongaling; secluded, favorite, and patrolled. Beach activity: fun things, cricket, quad bike rides, swimming. |

Source: our elaboration on TEQ Twitter accounts

The top-scoring @teqld themes (Table 3) include the Tourism industry, covering any issues that TEQ discusses with industry stakeholders and experts in different regions, and the tools and methods used by the DMO to interact with them. Business goes into the DMO's activities in more depth, covering both offline and online business, support, and opportunities, including partnerships. Attention is paid to Indigenous-owned tourism businesses as Indigenous tourism operators and attractions are important industry assets. Marketing provides more details related to the topics and tools central to the DMO's main activities. Finally, events - an important tourism and destination marketing tool that requires funding and management - covers the different types - occasional/recurring, local/regional or mega, sporting, cultural - of events that are, or could be, included in event strategy-making and portfolio building.

The following Tweets provide evidence of thematic content conveyed on the business-to-business ecosystem (Table 3), showing clarity and a professional and informative tone tailored to the needs and expectations of a businesses and professional network:

“This week's industry news - Qld to host the @WNBL [Women's National Basketball League] from next month Good to Go campaign extends to ACT, BIG4 campaign” (Tourism industry - tools to engage the industry)

“Industry news - Queensland events Good To Go, COVID-19 updates, business coaching opportunity and more (Tourism industry - topics and tools to engage the industry)

“Affected by the North Queensland monsoon? Here is a summary of the business assistance grants and loans available” (Business - support)

“Grow Japan market - TEQ invites industry partners seeking growth from Japan to join the QLD on Tour Japan 2019” (Business - event business)

“TEQ's North America office has released a comprehensive update on its marketing activities” (Marketing - topic)

“Industry news - World Number 1 helps promote Indigenous tourism experiences, latest TEQ marketing update” (Marketing - topic)

“TEQ's market briefings series announced, new QDEP funding for events, latest marketing update and tips” (Marketing - tools)

“Latest tourism industry news in Eye on Q - includes Qld's sports showcase at SportAccord” (Tourism industry/Events)

Tab. 3: Top four themes in @teqlld

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organisations

| Themes/score | Sub-theme and description |
|------------------------|---|
| Tourism industry (203) | Industry stakeholders: aviation, hotel, event, Indigenous operators, leaders, leading experts, regional DMOs, tourism regions. Topics: local tourism economy, industry trends, domestic tourism (figures), outback tourism, Indigenous tourism attractions, bushfire recovery, recommencing tourism operations. Tools/ways to engage the industry: briefing, guidance, toolkits, campaigns, brochures and newsletters, snapshots. |
| Business (136) | Activity: online business, agile business, webinar, local business, events business, business support, business opportunities, business partners and Indigenous-owned tourism businesses. |
| Marketing (105) | Topic: costs, (international/global/marketing) campaigns, fashion market, (global/international/out-of-home) market, western markets, trends, market changes, initiatives. Tools: planning, briefings, snapshots, insights and (future) approaches, activity updates, (email marketing) metrics |
| Events (86) | Type: regional and annual events, destination events; major events capital, sporting events, professional surfing, hockey, tourism business-to-business events, festival events and sustainable events; spectacular, live, spawning; event management, huge event funding. |

Source: our elaboration on TEQ Twitter accounts

4.2 Unique themes for each Twitter ecosystem: the effects of the COVID-19 pandemic on content

The effects of the pandemic on content only appear in the business-to-business ecosystem in the sub-themes unique to each account (Table 4). COVID-19 (51) includes specific support mechanisms for the tourism industry and businesses to help them to deal with the crisis, the impact of which has been unprecedented. Another niche theme in @teqlld is Indigenous tourism (11) which covers specific ways of enhancing, and extracting value from, Indigenous resources in partnership with cultural and creative industry stakeholders (Indigenous artists and the Cairns Indigenous Art Fair). The goal is to raise the profile of Indigenous tourism in Queensland's image-making. Again, the urban component of the tourism offer makes no appearance.

The following Tweets exemplify the unique thematic content conveyed in the business-to-business Twitter ecosystem (Table 4)

“COVID-19 update - What the latest Greater Brisbane restrictions mean for Queensland's tourism operators” (COVID-19 - crisis communication)

“VIC LOCKDOWN: What Qld's tourism operators should do. Get easy-to-understand info for your guests” (COVID-19 - business aids)

“Indigenous tourism resource - Tourism businesses can access information about the support available” (Indigenous tourism - specific aids)

“Year of Indigenous Tourism extended, Queensland the nation’s sporting capital, business development opportunities” (Indigenous tourism - development of indigenous tourism)

On @Queensland, unique sub-themes include turtle visiting (44) and rainforest destinations (28) and are linked to this account’s main themes (experience, views, and time) (Table 4). The turtle theme teaches people how to experience and protect this native species and its environment, parts of which are currently well preserved while others are at risk. Specific destinations (O’Reilly’s, Daintree) feature in the rainforest theme, focusing on both the universal value of this extraordinary ecosystem and the self-help/self-development benefits of experiencing it. Examples of Tweets on these unique sub-themes are the following (Table 4):

“If you’re visiting us over the coming months, join one of our complimentary tours. Turtle nesting season has officially begun” (Turtles - time)”

“The turtles are coming to Heron Island: If you’ve been dreaming of a turtle and awesome nesting or hatching experience” (Turtles - experience)

“Drone footage shows the largest remaining breeding ground for green turtles in the world. The video revealed up to 64,000 turtles” (Turtles - environment/views)

“Daintree Rainforest. Tropical Far North Queensland, Where the rainforest meets the reef. Home to both rare fauna and flora” (Rainforest - specific destinations)

“Craving something new this weekend? From roaring waterfalls to nature walks in ancient rainforests” (Rainforest - value)

“You can’t buy happiness but you can book a #RiverDriftSnorkelling tour through the world’s oldest tropical rainforest (Rainforest - value)

Tab. 4 Unique themes in @Queensland and in @teqld

| Account | Themes/score | Sub-theme and description |
|-------------|-------------------------|---|
| @Queensland | Turtles (44) | Experience: magical (turtle) sightings, (turtle) nesting, places to experience the turtles. Environment: habitat conservation, war on waste. |
| | Rainforest (28) | Specific destinations: O’Reilly’s and Daintree. Value: World Heritage Rainforest, destination retreat. |
| @teqld | COVID-19 (51) | Business aids: resources to prepare and respond, business continuity plans, advice on managing staff, crisis communications, webpage providing the latest official advice and resources. |
| | Indigenous tourism (11) | Specific aids: new expressions of interest in indigenous tourism resources and indigenous artists, new industry brochure with information and support to develop and promote Indigenous tourism experiences, sculptural/artistic installation at Cairns Airport in partnership with the Cairns Indigenous Art Fair. |

Source: our elaboration on TEQ Twitter accounts

4.3 TEQ's Twitter ecosystems: key players and influence

More than 650 single users were directly mentioned in the conversations (tweet, retweet) posted on TEQ's Twitter ecosystems: 484 single accounts were mentioned on @Queensland and 123 on @teqld (Table 5). The overlap between the two ecosystems is marginal - only 40 (6.1%) of the total single users are mentioned in both accounts. They correspond to the key players who benefit most from, and have most influence on, the information shared in the ecosystems. In both Twitter accounts the majority of key players is domestic (77.7% and 76.4%, respectively) and most are located in Queensland (49.4% vs 49.6%) - less than 25% of influential players are international. The intense communication on @Queensland and the community size and location are consistent with the destination marketing strategy of targeting an international audience pursued in the business-to-customer environment.

Tab. 5: TEQ's Twitter ecosystem members and their locations – percentage numbers

| Location | @Queensland | | @teqld | |
|-------------------|--------------------------------------|--------------------|------------------------|--------------------|
| | Single user mentioned ¹ % | Followers % | Single user mentione % | Followers % |
| Queensland | 49.4 | 11.5 | 49.6 | 36.8 |
| Rest of Australia | 28.3 | 16.1 | 26.8 | 19.6 |
| International | 22.3 | 30.1 | 23.6 | 17.6 |
| Unknown | 0.0 | 42.3 | 0.0 | 26.0 |
| Total | 100.0 ² | 100.0 ³ | 100.0 ² | 100.0 ³ |

Footnotes:

1 Single user mentioned: accounts mentioned in tweets and retweets both @Queensland's or @teqld's direct followers and others

2 Total number of single users mentioned: 376 in @Queensland and 123 in @teqld

3 Total number of followers: 165,892 in @Queensland and 17,910 in @teqld

Source: our elaboration on TEQ Twitter accounts

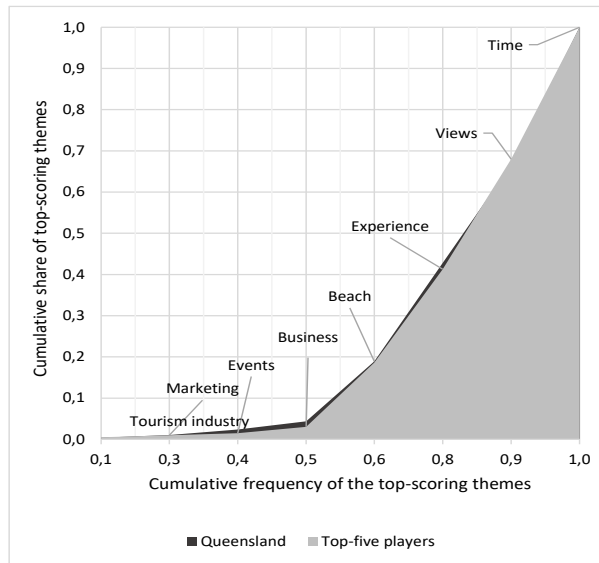
All stakeholder categories are represented amongst the influential players. The top three representative ones - business, media, and promotional categories - are the same in the two accounts (Figures 2 and 3). Their representativeness and influence, however, differ. On @Queensland (Figure 2), the top five represented categories (including individuals and sports) account for 79.1% of the total number of influential players and 86.7% of mentions. On @teqld (Figure 3), they are 85.4% and 78.1% respectively, including sports and regulation. Despite being the third most representative in both ecosystems, promotional accounts are the most influential, accounting for 64.0% of mentions on @Queensland and 25.1% on @teqld. The second most influential category is business, accounting for 9% and 22,7% of mentions in each ecosystem respectively. On @Queensland, the top five influential players are all promotional accounts, and the most influential player is actually Queensland (self-promotion).

Although (neither national nor regional) politicians are highly represented (3.3%) on @teqld (Figure 3), they are the third most influential (15.0%) category. In fact, one particular politician is actually ranked as the

most influential player. The top five players on @teqld are more diverse than those on @Queensland: two promotional accounts (ranked second and fifth), a business account (third), and a sports account (fourth). One of these promotional accounts (the one ranked fifth) is Queensland; Teqld is the sixth. Promotional accounts are also the most representative and influential of the few stakeholders represented on both ecosystems. The chi-squared tests showed that these differences are statistically very significant ($p\text{-value} < 0.001$).

The disproportionate influence of a handful of accounts on both ecosystems is revealed by cross-tabulating the top-scoring themes with the top five influential players for each account (Figures 4 and 5). Their influence is higher on @Queensland than on @teqld: on the former, it depends on a single category; on the latter, on heterogeneous categories. On @Queensland, the themes are more unequally distributed across the top five accounts than across the entire ecosystem, but the same four themes have the biggest share in both cases: the Gini coefficient raises to 0.54 (0.39 in Queensland). As the top five players are all promotional accounts, this category very largely shapes the conversations around time, experience, views, and beach within the ecosystem; Gladstone’s official account is the most influential (Gini = 0.67) followed by @Queensland and Tourism Tropical North Queensland (Gini = 0.60).

Fig. 4 The distribution of the top-scoring themes of the top five influential players in @Queensland compared to the top-scoring within the ecosystem generally



Footnote:

Top five players: the official accounts of promotional stakeholders (Tourism Queensland, Tourism Australia, Tourism Tropical North Queensland, Destination Gold Coast, and Gladstone)

Gini coefficient of @Queensland: 0.39

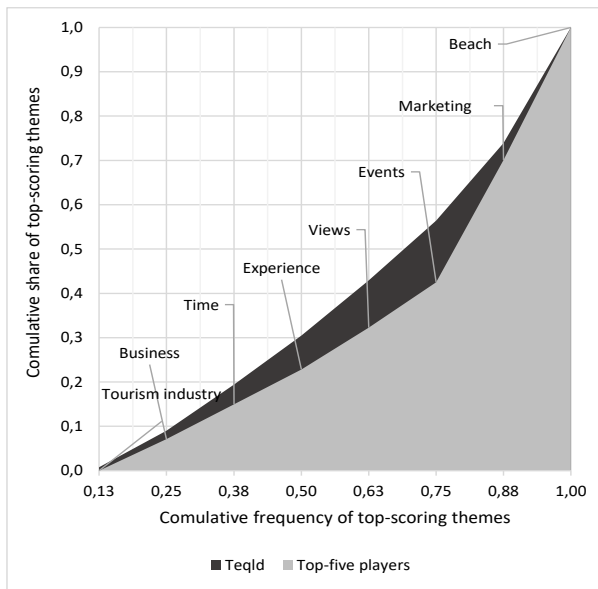
Gini coefficient of the top five players in @Queensland: 0.54

Source: our elaboration on TEQ Twitter accounts

The same is true for the business-to-business account (the Gini coefficient is 0.40 compared to the entire @teqld, 0.29) although the ranking of themes is different. The first two are the same as on @teqld (tourism industry, business) but they are followed by time and experience, the first and third themes in Queensland. The heterogeneity of the categories into which the top five players fall (a politician, a business, and three promotional accounts including @teqld itself) affects these shares.

The politician (Gini = 0.52), @teqld itself (Gini = 0.57) and the media account (Gini = 0.45) are the most influential of the five and lead the conversations around the tourism industry, business, and time. Tourism Australia and Destination Gold Coast are promotional accounts that appear in the top five within both ecosystems, along with TEQ's Twitter accounts.

Fig. 5: The distribution of the top-scoring themes of the top five influential players in @teqld compared to the top-scoring within the ecosystem generally



Footnote:

Top five players: the official accounts of a politician, a business, and three promotional accounts including @teqld itself.

Gini coefficient of @teqld: 0.29

Gini coefficient of the top five players on @teqld: 0.40

Source: our elaboration on TEQ Twitter accounts

5. Discussions

The content conveyed within Twitter ecosystems reveals the diverse ways in which the DMO uses this social media for creating and managing destination knowledge and who are the intelligent agents exerting the most influence on content conveyed in these environments.

The Twitter business-to-customer ecosystem resulted in being the environment of destination marketing knowledge, while the business-to-business ecosystem the environment of *destination management* knowledge, although less exclusively. This distinction reflects a fairly faithful reproduction in the digital environment of the primary DMO's functions (del Mar Gálvez-Rodríguez *et al.*, 2020; Trunfio and Della Lucia, 2019). It is also in line with previous studies (Gibbs and Dancs, 2013; Swani *et al.*, 2014) showing that the Twitter ecosystem affects the nature of knowledge communicated. This insight is strengthened by the audience that each Twitter ecosystem targets and the sub-themes particular to one or the other ecosystem. As is evident from its marketing content, @Queensland targets a big international audience of followers but interacts mainly with domestic key players (including individuals) - unsurprisingly, since almost all arrivals are currently domestic. In contrast, @teqld mainly targets and engages local stakeholders, in line with its destination management goals.

The themes that were unique to either of the Twitter accounts further qualify the marketing vs management knowledge distinction. The focus is on specific attractions and experiences on @Queensland (turtles and rainforest), and on specific stakeholders/assets (Indigenous people) or current crises impacting the destination on @teqld. The COVID-19 pandemic is a sub-theme unique to the business-to-business environment; the discussion focuses on the strategies and tools used to aid and inform industry stakeholders in this extreme situation. This result not only confirms that crisis communication has emerged as a growing and key function of the Twitter platform (Curlin *et al.*, 2019; Morgan *et al.*, 2021; Oliveira *et al.*, 2019) but also that DMOs are using Twitter as a knowledge management tool, i.e., a “what’s-happening-right-now tool that enables interested parties to follow individual users’ thoughts and commentary on real-time events” (Noor *et al.*, 2021, p. 610). However, one would have expected the COVID-19 theme to emerge also in the business-to-consumer environment as the literature has shown Twitter playing a crucial role not only in providing real-time information and promoting safety measures to tourism but also in keeping travellers engaged and interested in destinations, e.g., by promoting virtual travel experience, inspiring trust and affecting familiarity, sense of belonging and attachment with the destination (De Canio *et al.*, 2023) in order to reduce perceived risks, particularly for domestic tourists that represent an important share in this destination. Instead, the support measures put in place to promote destination resilience and the tourism industry’s recovery prevailed in Twitter communication, probably reflecting the strong partnership of the DMO with the tourism and events industry - the representativeness and influence that the business category has on @teqld.

An important latent insight gained by combining the marketing and management knowledge is the projection of TEQ as a soft and 3S-flavoured ecotourism destination focused on (terrestrial and marine) wildlife, beaches, and rainforests, complemented with Indigenous people and their life. This insight confirms the role of Twitter in supporting destination image shaping and branding (Revilla Hernández *et al.*, 2016; Sevin, 2013; Uner *et al.*, 2023). The fact that the territory’s urban (non-

Indigenous) dimension is effectively ignored is also evident, but this finding may be indirectly connected to the COVID-19 pandemic as not crowded destinations offering safety, space, and flexibility were preferred by tourists during the pandemic. This latent ecotourism image risks creating a conflict between the core and the periphery if not carefully managed. Urban-based business stakeholders, including regulators that are highly represented on @teqld, should be involved in promoting, reinforcing, or interacting with the latent ecotourism theme; they might want a stronger urban flavour to be included in the destination management knowledge, particularly in post-pandemic times.

The findings on the key actors exerting more influence over knowledge generation and management complement and strengthen the content conveyed within the Twitter ecosystems. Of relevance to this discussion is that the two accounts appear - at first sight - to function as separate environments, i.e., only a few influential stakeholders are represented across both ecosystems. However, the ties between the two are very strong as shown by the most representative and influential categories in both accounts. Three (business, media, and promotional) categories appear among the top five represented. Promotional accounts are the most influential, followed by business accounts. The third most influential categories are media on @Queensland and politicians on @teqld, although the regulators are more highly represented in the latter.

Significantly, the promotional category plays a strategic role in both ecosystems and, crucially, in connecting the business-to-consumer and business-to-business ecosystems and shaping the knowledge conveyed. Not only is this category the best-represented within both environments but the influence of a handful of its players is disproportionate. The DMO (TEQ) is the primary actor in this regard as its official Twitter accounts appear among the top five agents in each ecosystem. In other words, this particular intelligent agent's active management shapes the knowledge generated within and across the Twitter ecosystems. Promotional players influence the marketing knowledge created on @Queensland and the blending of management and marketing knowledge on @teqld. The conversations of the top players (all promotional accounts) lead the conversation on the business-to-consumer ecosystem: the content concentrates on the same top four marketing themes discussed on @Queensland. The heterogeneity of player categories, including promotional players, leading the conversation on @teqld blends the marketing themes with the management themes discussed in this ecosystem. Our findings on the extent to which players and particular categories influence Twitter content are partially consistent with the insights offered by an analysis of the networks of 14 DMOs (in large US cities) (Bokunewicz and Shulman, 2017). The latter study revealed that individual, media, and promotional accounts wield the greatest influence. Instead, our research shows that individual players rank as the fifth most influential category in the business-to-consumer ecosystem (@Queensland), while in @teqld, they hold the position of the third least influential. While Bokunewicz and Shulman's study did not explicitly distinguish between the business-to-consumer and the business-to-business environment and focused implicitly on the

former, our study covered both ecosystems and all the influential accounts. The former study analysed only the top 10 most influential accounts in the 14 DMO networks to determine the account types.

6. Theoretical and managerial implications

The insights of this research have methodological and theoretical value and managerial implications that could enable DMOs to reinvent themselves *sustainably* as intelligent agents. The integration of Bokunewicz and Shulman's (2017) stakeholder category types with the regulator and politician categories is novel and contributes to integrating the different strands of the literature on Twitter content, ecosystem configuration in terms of stakeholder categories and influential players. Each ecosystem is confirmed to have its own knowledge domain and distinguishing characteristics in terms of the variety and representativeness of stakeholder categories. The latter's influence is crucial to the shaping of the knowledge domain and connecting the ecosystems. Studying combinations of these issues is thus relevant and effective theoretically and strategically. While the representativeness of individuals (potentially tourists) is significant in the configuration of the business-to-customer environment - as shown by Bokunewicz and Shulman (2017) - and that of regulators in the business-to-business environment - as shown by our study - what resulted to be crucial and impacting on content/knowledge is the promotional category and, indeed, the disproportionate influence of just a handful of promotional players, including the DMO itself. The influence that these actors have on both the destination marketing knowledge created within the business-to-customer ecosystem and the blending of management and marketing knowledge in the business-to-business one, qualifies them as intelligent agents in the destination digital environment. This insight sparks a discussion regarding the ideal characteristics and functions of an intelligent agent within an organisational network that collectively generates value through collaborative and competitive engagement among multiple stakeholders on shared digital platforms. Although social media ecosystems have been demonstrated to shift the centre of knowledge towards "the many" (the social media users) and foster tribal dynamics among community members to drive the evolution toward new value generation paradigms (Munar, 2012), it appears that primary actors still retain ownership and authority over knowledge creation and dissemination. The boundary between collective responsibility and manipulation in value generation appears muddled unless the role of intelligent individuals is rooted in shared values. To put it differently, establishing common values is imperative for the sustainable development of a destination's collective knowledge and value.

From the managerial viewpoint, these advances have preliminary implications. First, Twitter is a destination-knowledge-management tool that can be used actively and intentionally by DMOs to create and manage destination-knowledge in different environments: it targets specific audiences providing specific knowledge within a community of

interconnected players while integrating destination management and marketing knowledge. Second, this integrated knowledge may strongly affect destination image, product development and tourism experience building, thus impacting the collaborative/competitive dynamics between actors who are representative - or not - of this image. Third, and closely related, the health and resilience of the ecosystems may be affected by any concentration of knowledge (creation/management) in the hands of very few promotional intelligent agents, if the latter (choose to) exploit their domination. Fourth, in line with the literature that widely recognizes the role of tribal dynamics between diverse community members for value generation, DMOs must allow and foster these value co-creation dynamics being responsible intelligent agents whose decisions and actions are values-based. Fifth, identifying and involving other representative and/or influential players is crucial to contribute to creating collective knowledge and value within the ecosystems. Such players may be tourists - in the business-to-customer ecosystem - or regulators - in the business-to-business one. Moreover, partnering with strategic stakeholders (digital companies/providers) within the ecosystem may help DMOs to develop their capabilities and tools to sustainably manage destination knowledge.

7. Conclusions

This paper examined the evolving role of the DMO as an intelligent agent (Sheehan *et al.*, 2016) creating and managing collective knowledge and value through digital business ecosystems meant as new organisational networks based on digital platforms (Senyo *et al.*, 2019). Social media are relevant and dominant business ecosystems used as main market intelligence sources for destination management and marketing (Miah *et al.*, 2017). The originality of this paper lies in the combination of relevant topics related to the use of Twitter by DMOs in both the business-to-consumer and business-to-business ecosystems. The joint analysis of content conveyed on Twitter and the key players that have most influence or are seeking more influence offers an integrated perspective on the use of this platform for digital destination management and marketing. This comprehensive perspective is needed for DMOs to consciously take the role of intelligent agents in an era characterised by democratic access and participation in value generation and sharing. While Twitter use is steadily increasing in the destination domain, the literature has done little to explore how this is happening or may happen, responsibly and sustainably. Previous studies have assessed relevant issues separately thus providing fragmented pieces of knowledge. Thus, analysing the intelligent use of the Twitter digital ecosystem through an integrated approach appears to be novel so far, deserving further research, particularly to serve the sustainable goals of responsible intelligent agents.

This exploratory contribution has limits, particularly as it deals with a single case study with destination-specific characteristics. It means that the findings cannot necessarily be easily generalised to other contexts. Extensive case study analyses on an international scale and covering

a variety of both DMOs and social media tools are needed to collect insights about how these organisations are becoming intelligent agents and which social media are best or most often leveraged for this purpose. Longitudinal evaluation studies are also needed to assess the paths taken in terms of stakeholders engaged, themes covered, and tools used by DMOs pre and post-the impact of global crises (e.g., the COVID-19 pandemic). Key issues would appear to include the increased digitalization of DMOs; stakeholder access to and participation in digital ecosystems; social values grounding destination value generation; the development of specific needs such as virtual tourism, which complements and substitutes the physical experience; and further information on health-safety standards, working conditions, and sustainability-related issues.

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sinergie
italian journal of management
ISSN print 0393-5108
ISSN online 2785-549X
DOI 10.7433/s122.2023.05
pp. 95-123



Nudging for environmental sustainability. Behavioral insights from an on-field experiment #iNUDGEBarletta

Received
29th September 2022
Revised
26th January 2023
Accepted
14th November 2023

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Abstract

Frame of the research: *The work delves into the contemporary debate surrounding Nudging, positioning itself as a contribution to the ongoing discussion. It specifically focuses on Nudging as a method to influence human behavior and mold decision-making processes. The paper seeks, by the real case study #NUDGEBarletta, to unravel the intricacies of this approach, shedding light on its impact in guiding individuals and shaping their choices.*

Purpose of the paper: *The #iNUDGEBarletta project turns Nudge's theories into operational, applying them in the field of environmental sustainability, to the management of littering in cities. The purpose is to educate citizens, so that, behaviors deemed socially responsible are internalized and become consolidated habits and conscious choices, rather than, actions implemented under threat of sanction which, presumably, stop being implemented at the same time as the coercive measure should be removed.*

Methodology: *The present study uses a simple form of context changes (gentle push), applied on waste collection tools, to examine the effectiveness of a nudge policy for reducing littering in cities.*

Findings and Results: *The simulation, based on real data from Barletta (Apulia, Italy) old town, confirms realistic impact on social behavior and responsibility about the topic and demonstrates the usefulness of nudge strategies to obtain desired actions from people, in order to efficiently manage the public thing and, in the specific, reduce the level of littering.*

Research limitation and Practical implications: *The paper offers a small research case based on small amount of funds and time, as experimental project, that could be subject of further studies and developments through the analysis of other real cases and empirical tests.*

Originality of paper: *This experiment is a real application of nudging strategies in the Public Administration and demonstrates how small contextual tricks can "kindly push" people to engage in healthier and more sustainable lifestyles.*

According to the researchers In Italy the potential of nudging is still little exploited, and the originality of the paper lies in proposing a new planning path to PA through which, relying on the use of Nudge, new solutions can be studied and the choices of the Administration directed towards the attitudes of its citizens.

Key words: *nudge for good; social sustainability; people behavior; communication strategies; public administration; gentle push; littering.*

1. Introduction

The world generates 2.01 billion tons of municipal solid waste annually, with at least 33 percent of that not managed in an environmentally safe manner, that means 0.74 kilograms waste generated per person per day. Looking forward, global waste is expected to grow to 3.40 billion tons by 2050, more than double population growth over the same period¹.

The amount of waste produced in Italy, as other nations in the Globe, increased from 486 kg per capita in 2015, to 505 kg per capita in 2020, and this data will continue to increase because of the accelerating resource exploitation, the increasing consumption and the population growth (Hoornweg, 2012).

In specific for this experiment, the amount of generated waste per capita in Puglia reached the 471, 4 kilograms per inhabitant in 2020, despite 467 kilograms per inhabitant in 2019². Cities in the specific, have a huge ecological footprint: they occupy only about three percent of the earth's surface, but they consume three quarters of global resources and are responsible for 75 percent of gas emissions³.

The occurrence of waste issue is linked to the littering and the trash disposing, where many people may not be aware that their behavior is not environmentally friendly in daily routines (Wee *et al.*, 2021; Xu *et al.*, 2021; Zhang and Wang, 2020). Indeed, littering is a potentially self-reinforcing problem, where it is demonstrated that visible garbage in public spaces invites individuals to litter more in these spaces themselves (Keizer *et al.*, 2011; Schultz *et al.*, 2013).

Coherently with this point of view, Scholars and policy makers have demonstrated that littering in urban environment reduces the perceived aesthetical quality of it by residents, as predictive for residents' place attachment and (Roda *et al.*, 2016; Brown and Raymond, 2006), diminishing efforts into caring for one's residential environment. For this reason, the adoption of a Waste Management System to defense the public spaces emerges as a key factor to improve the subjective experiences of municipalities residents, and at the same time the attractiveness for tourists.

To manage the effects of the impact of the waste production, it is well established that the most effective method of mediating the interests of both consumeristic societies and global sustainability is achieved through adequate resource and waste management techniques (Legarth, 1996; Pasqual and Souto, 2003; Ngoc and Schnitzer, 2009; Jegatheesan *et al.*, 2009). This aspect emerges by the centrality of the litter issue is clearly confirmed by the Objective 11 in Agenda 2030 that, at a political-institutional level, aiming at reducing the per capita pollution produced by cities, in particular with regard to air quality and waste management.

¹ World Bank, Trends in Solid Waste Management https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html

² Statista Research Department Municipal solid waste generated per capita in Italy in 2018-2020, by region, 2021. <https://www.statista.com/statistics/683114/per-capita-municipal-solid-waste-generated-in-italy-by-region/>

³ Goal 11: Make cities inclusive, safe, resilient and sustainable <https://www.un.org/sustainabledevelopment/cities/>

Thus, littering and cigarettes on the streets are two close consequences of poor waste management. Abandoned waste has always existed, but the dimensions have assumed currently the problem can be traced back to the increase in mobility in our societies and in the consumption outside the home, which led to waste to make its way into almost all environments (Krausmann *et al.*, 2018). Cigarette filters are the most littered item worldwide (Castaldi, 2020). It is estimated that roughly 4.5 of the 6 trillion cigarettes smoked across the world every year are discarded into the environment (Novotny and Slaughter, 2014). In addition to aesthetic concerns, cigarette littering poses a serious threat to the environment and human health, due to both their plastic elements and their toxic and carcinogen components. According to some studies, their source material never disappears (Novotny *et al.*, 2009).

From this perspective, the group attempted to define a useful strategy to lowering cigarette and littering in the streets by taking in exam the historic center of Barletta city in Apulia, Italy, the sixth city of the Region and an important tourist destination.

In Barletta, garbage disposals are an important urban problem, connected to high cleanup costs, decreased satisfaction with the neighborhood among residents, and reduced attractiveness for tourists. Moving from this consideration, to solicit responsible behavior from individuals in a sustainable key it needed to identify management strategies useful at keeping public spaces clean (Cialdini *et al.*, 1990).

Several studies have revealed that attitudes and beliefs to keep the environment clean do not necessarily translate into improved recycling behavior patterns (Corral-Verdugo, 2003; Diekmann and Preisendörfer, 2003; McCoy *et al.*, 2018). Indeed, scholars have adopted, over time, several well-established psychological theories to understand or to explain the bad attitude towards environmental issues:

1. the Rational Choice Theory (RCT) explains that people calculate the likely costs and benefits of any option before deciding (Riker, 1995; Goldthorpe, 1998; Best and Kneip, 2011), so the actor responds to information over an environmental issue and incentives deriving from the respect of underlying rules;
2. the Theory of Planned Behavior (TPB) assesses that perceived behavioral control over a due context influences the likelihood that an individual will attempt to carry out any action (Ajzen, 1991; Liu and Sibley, 2004);
3. the Theory of Hyperbolic Discounting (THD) states that the perceived payback period affects a choice, where a decision maker would tend to choose a small benefit in the short term over a large benefit in the long term, discounting the value of the latter (Groom *et al.*, 2005).

Since people are influenced by emotions, impulsivity and limited cognitive capacities (Simon 1955; Tversky and Kahneman 1974), the three theories above mentioned could turn out to be not adequate to explain because a decision to litter could reveal a *dilemma* (Kolodko *et al.*, 2016; Heuvel, 2019): even if most people prefer a clean environment and that certain standards could be considered, there is still a temptation to litter or to do other practices that are not in favor of the environment, because it

is easier - in that circumstance - to throw a litter on the street than to find out where a rubbish bin is located. Therefore, the dilemma is translated into a divergence between the pursuit of a public interest (environment protection) and the motivations, needs, attitudes and psychological profile of the single individual.

Thus, fixing this *dilemma* is essential for addressing environmental challenges (Fischer *et al.*, 2012; Cowling, 2014). To pursue this goal, it is fundamental to assume that people choices often rely on social norms, personal beliefs, and arbitrary clues, all dependent on a specific situation, in which the public interest must be at the center of the individual's mindset.

Thus, the problem of waste management and littering can be understood primarily as a social behavior (Ceschiet *al.*, 2021) and from this perspective we started our project by analyzing data reached by an online interview, on consumers' behavior, perceptions about the problem of litter abandonment on the streets, and triggers that would encourage respondents to adopt better behavior toward this occurrence.

Established that people's decision-making processes are almost never guided by perfectly rational principles (Lunenborg, 2010), in this paper we will observe how much this happens and how much people are suspended between conflicting cognitive processes: rationality vs irrationality, social norms vs own mindset, value of public goods vs individual's interest (Bauer, 2022).

Existing literature suggests that there are four major policy options for dealing with problems of consumer waste and littering: a) prohibition or restriction, b) public education norms, persuasion, or appeals to emotion; c) tax or subsidy, intended to either substantially increase or decrease the cost of a behavior; and d) nudging, which involves the deployment of gentle push to encourage but not compel alternative behaviors. (Gunningham and Sinclair, 2017; Thaler and Sunstein, 2008; Rivers *et al.*, 2017).

Daniel Kahneman and Vernon Smith, exponents of Behavioral Economics and both Nobel Prize winner for Economics in 2002, were the first to deal with these issues and found that in the real world, economic agents act in a very different way from the rationality models of neoclassical economics, and they understood that, deviations from this rationality occur in a systematic and therefore predictable way (Tversky and Kahneman, 1974; Kahneman and Smith, 2002).

In order to explain real behaviors, it is not enough to focus on rationally relevant information, but it is necessary to try to reconstruct the mental model, used (sometimes unconsciously) by people to represent the decision-making context in which they act, going beyond, and trying to predict in advance the direction that will take the behavior of individuals (Johnson-Laird, 2012).

These theories, allows scholars and researchers to produce normative advice that can inform everyday life choices and that can direct them toward the best choice.

So, our analysis uses a similar approach by acting on this "predictable irrationality" (Watson, 2018), to make policies more effective, by directing the behavior of citizens, exposing them to more or less implicit stimuli given by particular expedient context (rather than operating through the

heavy-handed channel of legislation).

We acted, with the aim of reducing littering on city streets, through interventions that are increasingly defined as nudge, i.e., gentle pushes, aimed at directing people's minds to make certain decisions: nudge is necessary to support human choices in light of the limited rationality that distinguishes us. (Kahneman and Smith, 2002).

The purpose of our Nudge strategies is to educate people and to commute behaviors considered socially optimal, in internalized conscious choices and habits, rather than actions taken under threat of sanctions that, presumably, stop being implemented in the same moment in which the coercive measure is removed (Schmidt and Engelen, 2020).

So, we would demonstrate how subjective people's decisions about not to throw or discard their waste on the street, could depend on social context and how much this involves people, in correct social acting.

Thus, the following research questions were raised for nudging pro-environmental behavior:

RQ1: Can nudging be used by Municipalities to promote the reduction of littering behavior?

RQ2: How effective is nudging in reducing littering?

To address above research questions, the present article starts by presenting the concept of nudging in paragraph 2. Then we would give evidence to an experimental case conducted in a city placed in one of the most important Italian regions having a well-defined touristic vocation (paragraph 3). After that, paragraph 4 is presenting the finding of the experiment in accordance with the research questions. We cap this work with a discussion on the legitimacy of nudging as key lever for public decision-makers, underlying the limits of the work and the opportunities for further experiments (paragraph 5).

2. Theory and literature on nudging

According to some recent studies, nudging is considered a useful strategy to bring about context-specific behavior change, complementing traditional policy tools rather than replacing laws, regulations, and economic instruments.

Nudging is an approach that changes people's behavior by altering the decision-making environment to influence people's choices when they decide to behave in a certain way. Its implementation must be simple, inexpensive, and noncoercive (Thaler and Sustein, 2008). Nudging influences people's decisions to act without limiting their options or enforcing rules and regulations. Instead, it steers people's decisions in a desired direction by setting cues in the environment (Weßel *et al.*, 2019). Without depriving existing options, it can improve people's choices by changing the way they are presented in accordance with the options in context (McCoy, 2018; Schmidt and Engelen, 2020).

It is also important to understand how nudge works and, which kind of intervention could be adopted to pursue the desirable objectives.

To show up the first aspect (how nudge works), as defined by Thaler and Sunstein (2008), it “is any aspect of the choice architecture that alters people’s behavior in a predictable way *without forbidding* any options or *significantly changing their economic incentives*” (Thaler and Sunstein, 2008, p. 6; Osman, 2016).

The nudge was born just so, with the intent to leverage cognitive bias to influence, induce and persuade individuals to change their behavior, changing the architecture of their choices in an ethical, positive and beneficial way to society (Thaler and Sunstein, 2008).

The role of nudging as a new and original policy solution to pursue socially optimal goals has recently started being investigated by the behavioral economic literature (Beccchetti, 2016).

Nudge, it’s very important for governments that want to make social changes that based their result on people’s actions. Suppose for example that a government’s social policy agenda is to promote a healthier, wealthier, and happier population, but this one finds it hard to behave in ways that consistently meet these objectives (Osman, 2016; Godden, 2016).

This approach lays its foundations in the concept of *Libertarian Paternalism*, that creates a compromise between these two seemingly oxymoronic terms. While the first emphasizes the right to total freedom of decision of the individual, the second term alludes to a society that binds individuals to rules and patterns of decision-making imposed and predefined through laws, rules and prohibitions.

Thaler and Sunstein identify the term *Libertarian Paternalism* or, as Cass Sustain in “Why Nudge? The Politics of Libertarian Paternalism, 2014” used, “Soft Paternalism”, and described it as “actions of the government that attempt to improve people’s welfare by influencing their choices without imposing material costs on those choices... We can understand soft paternalism, thus defined, as including nudges” (Sustain, 2014, p. 58).

There are no prohibitions or deprivations imposed from above, but only small prods that stimulate us to make a more desirable decision, otherwise ignored because of the natural limits of human rationality (Thaler and Sunstein, 2003). Without depriving people of anything, they will have all the existing options at their disposal, but will change how the desired options are presented to them within the context (Schmidt and Engelen, 2020).

These studies are based on a constant accumulation of socio-scientific research showing how susceptible people are to cognitive bias (Haselton *et al.*, 2015), giving in to influences and their own emotions, making hasty and irrational decisions.

Lastly, it is also important to understand which kind of intervention is optimal, in order to ensure optimal effects. The interventions can be heuristic blockers (process-oriented, preventing cognitive errors by blocking or eliminating the irrational operations of mental shortcuts), heuristic triggers (outcome-oriented, activating mental shortcuts to a desirable goal) or informative (Barton and Gruene-Yanoff, 2015; Souza-Neto *et al.*, 2022). Beshears and Gino (2015) argue that nudges work in

three different ways:

- (a) by triggering intuitive thinking - arousing emotions, using biases, simplifying processes;
- (b) by stimulating reflective thinking - through shared assessments, creating opportunities to think about a decision, using planning prompts, encouraging broader thinking, reinforcing personal responsibility, encouraging consideration of conflicting evidence, using reminders; and
- (c) by bypassing both types of thinking - prescribing default options or building in automatic adjustments.

In order to ensure optimal effects, it is fundamental to adopt one of the following techniques (Wee, 2021):

- Prompting: using non-personalized information to promote or raise awareness of a particular good practice. The information suggested to promote pro-environmental behavior is knowledge information (e.g., knowledge about environmental protection, current environmental information, existing environmental problems) and social norms information (e.g., what others do or have done for the environment);
- Sizing: changing the size or quantity of the object. Some of the suggestions for environmentally friendly purposes are increasing the size of the wastebasket to encourage recycling, decreasing the size of the general bin to encourage waste separation, decreasing the size of the plate to reduce food waste, etc.;
- Proximity: facilitates or hinders access to behavioral options. It is suggested to make environmentally friendly settings the default (e.g., double-sided printing, no straw, cutlery only on request) and to change the placement of environmentally friendly products or objects so that they are close to people (e.g., place sustainable food or energy-saving products at consumers' eye level, place recycling bins next to the exit door);
- Priming: placing cues in the environment to influence subconscious decisions, tapping into people's subconscious and trigger their subconscious responses that lead to environmentally friendly behavior (e.g., footprints that might encourage people to walk in the desired direction and use the stairs or organic produce section).
- Presentation: changing the visual design or presentation of the object. It is suggested that the presentation of environmentally friendly objects or tools can be changed or redesigned to attract people's attention to adopt or consume them (e.g., changing the appearance of the waste basket, changing the packaging of the sustainable food).

Nudge tools can be applied to a thousand areas of collective life: from nutrition to urban traffic management, from struggle to tax evasion up to a more conscious relationship with the environment, by reducing the use of water (Ferraro and Price, 2013) or electricity (Allcott, 2011) for example.

The study of this applied strategy starts from a very particular perspective that is rooted in 2 key principles: the rejection of the axioms of rational decision theory (Simon, 1997) and the idea that human irrationality depends in a systematic way on small contextual arrangements that can be modified to promote better choices without changing the constraints

available to those who choose. Analyzing recent and different study, it's possible defined that, *changes to the physical environment* are one of the most important policies able to have a significant impact on individuals' choices, as in the example of increasing the share of cycling in Denmark, Germany and Netherlands (Pucher and Buehler, 2008), or resizing plate and portion for reducing food waste (Rolls *et al.*, 2002; Freedman and Brochado, 2010).

3. Experimental design & methodology

Based on theoretical considerations, we designed a pilot intervention, leveraging on descriptive social norms and reducing cognitive effort in properly waste disposing. With the project #iNUDGEBarletta we turn into operational the Nudge theories, by applying them in the field of environmental sustainability in particular to the city of Barletta in Apulia that, like many other Italian cities, suffers from a strong problem of waste abandonment (littering).

The project objective is to reduce the number of cigarettes and waste abandoned on the street. The verification place taken into consideration is the historic center of Barletta in the part that extends from Piazza Marina along Via Mura San Cataldo, up to the Covo delle Sirene (620 square meters).

The design simulation was possible with the cooperation, in the operational intervention group of: Municipality; Bar.S.A s.p.a, company participated by the City of Barletta for separate waste collection; SGmetal, individual enterprise in the manufacture of objects made from iron, copper and other metals; Retake Barletta, movement of citizens that deals with clean up and promotes civic sense and Dr. Irene Ivoi, industrial designer of circular strategies.

We measured data of waste management and littering from 02 September 2021 to 13 September 2021, through reports, photos and results in terms of garbage bags and cigarettes collected.

Therefore, in order to evaluate the effectiveness of our Nudging policy, the longitudinal technique of the before-after was chosen, that is, comparing the perceptions of cleanliness of the urban context before and after the application of the Nudging strategies.

From a methodological point of view, the experiment followed the following steps:

1. survey;
2. baseline;
3. nudging;
4. checking & comparing

3.1 Survey

Among the several methodologies used to observe the behavior of individuals, we have selected the best method based on the following general parameters:

- specific feasibility constraints, arising from the COVID-19 emergency measures to contain the epidemic⁴;
- observer biases and errors, due to the influence of cognitive biases of social proof, or other nature, on respondents' choices⁵ (Amble and Bui, 2011). In the face-to-face questionnaire administration, the lack of certainty of anonymity and the face-to-face relationship between interviewer and respondent, could potentially cause a bias with respect to the truthfulness of the answers, only for the manner in which the questions are posed (question wording), or, for other parameters within the scope of the interviewer-interviewee interaction (Schuman and Presser, 1996).

Therefore, the research team preferred to use the technique of retrospective interviews, through the use of a questionnaire created through Google Forms, to be submitted online and filled out anonymously.

The survey was conducted over a period of time from 28/08/2021 to 07/09/2021, by posting a link through:

1. the personal Instagram page, of Rossella Piccolo;
2. sending to a Whatsapp *broadlist* of Barletta's citizens only;
3. sending via Whatsapp to direct contacts not resident in Barletta but who often frequent the historic center of the city.

To get a clear idea of the response rate to this questionnaire it was necessary to estimate the Redemption, calculated on the number of users reached through the three aforementioned channels, equal to 15.05%, as shown in the Tab. 1.

Tab. 1: Redemption rate

| Channels | Contact |
|--|---|
| Personal Instagram profile @rossella_piccolo_ | 1.369* * No sampling criteria |
| Broadlist Whatsapp | 105* * Residents in Barletta. Convenience champion |
| Direct contact Collaborator 1: 20 Collaborator 2: 40 | Total: 60* * Non-residents in Barletta. Sample reasoned on the basis of the "knowledge of the Historic Center" |
| Total | =1.369+105+60=1.534 |
| Redemption rate | =231 / 1.534 = 15, 05% |

Source: Our elaboration

⁴ LAW-DECREE July 23, 2021, No. 105- Urgent measures to deal with the COVID-19 epidemiological emergency and the safe exercise of social and economic activities.

LAW No. 106 of July 23, 2021- Conversion into law, with amendments, of Decree-Law No. 73 of May 25, 2021, on urgent measures related to the COVID-19 emergency, for businesses, labor, youth, health and territorial services.

⁵ Social proof is an informational influence. Receiving information about how others behave (social proof) leads to greater compliance among people. <https://www.behavioraleconomics.com/resources/mini-encyclopedia-of-be/social-proof/>

From questionnaire (Tab. 2), were collected 231 valid interviews, whose composition is defined as follows:

- based on gender: 69.7% are women while 30.3% are men;
- based on age: 38.5% between 17-25 years; 30.7% between 41-60 years; 24.2% between 26-40 years; the complement, divided between under 16 and over 60, is equal to 6.6%;
- based on citizenship: 87% are citizens of Barletta, 13% only visitors who periodically visit the historic city center.

Tab. 2: Questionnaire Structure

| Items | Item's description | Scale | Modalities |
|------------------------|--|---------------|---|
| 101_Gender | Gender | Dichotomic | (1) M; (2) F |
| 202_Age | Age | Ordinal | (1) <16; (2) 17-25; (3) 26-40; (4) 41-60; (5) >60 |
| 303_Citizen | Are you a citizen of the city of Barletta? | Dichotomic | (1) Yes; (2) No |
| 404_Freq_visit | If not, how often do you visit the city? | Ordinal | (1) Never Been; (2) <2 times/month; (3) >2 times/month; (4) 1+ times/week |
| 505_Overall | Overall, how do you judge the quality of the environment and the cleanliness of the city of Barletta? | Ordinal | (1) Terrible; (2) Bad; (3) Sufficient; (4) Good; (5) Excellent |
| 606_Center_clean | How clean do you think the historic center of the city of Barletta is? | Ordinal | (1) Terrible; (2) Bad; (3) Sufficient; (4) Good; (5) Excellent |
| 707_Causes | If you think the historic center is not clean, where do you think the cause of dirt comes from the most? | Dichotomic | (1) Citizen's; (2) PA's |
| 808_Rel_waste | How much the abandonment of waste in the historic center of Barletta is relevant? | Ordinal | (1) Not at all; (2) Quite; (3) Enough; (4) Very; (5) Relevant |
| 909_Rel_butts | How much the dispersion of cigarette butts on the streets of the historic center is relevant? | Dichotomic | (1) Yes; (2) No |
| 1010_Health_overall | In your opinion, what percentage of people's health directly depends on the quality of the environment in which they live? | Ordinal | (1) 0-20%; (2) 20-40%; (3) 40-60%; (4) >60% |
| 1111_Health_own | How much do you think this problem could be relevant to your personal sphere? | Ordinal | (1) Not at all; (2) Quite; (3) Enough; (4) Very; (5) Relevant |
| 1212_Tourism_affect | How much do you think this problem could affect tourism in the city? | Ordinal | (1) Not at all; (2) Quite; (3) Enough; (4) Very; (5) Relevant |
| 1313_Tourism_fix | Do you think that a cleaner and more well-kept historic center could be a strong point for the city's tourism? | Dichotomic | (1) Yes; (2) No |
| 1414_Informed | Do you think that citizens are sufficiently informed about waste management methods? | Dichotomic | (1) Yes; (2) No |
| 1515_ProEnv_Behav | How do you, as a citizen/visitor, act on a daily basis so as not to fuel the problem? | Open question | |
| 1616_Sat01_NumBins | What is your degree of satisfaction with the number of waste bins in the historic centre? | Ordinal | (1) Terrible; (2) Bad; (3) Sufficient; (4) Good; (5) Excellent |
| 1717_Sat02_Dist_Capac | What is your degree of satisfaction with the distance between them and their capacity? | Ordinal | (1) Terrible; (2) Bad; (3) Sufficient; (4) Good; (5) Excellent |
| 1818_Sat03_Visibility | What is your degree of satisfaction with their visibility and aesthetics? | Ordinal | (1) Terrible; (2) Bad; (3) Sufficient; (4) Good; (5) Excellent |
| 1919_Sat04_CigBins | Are there containers for the collection of cigarette butts in the historic centre? | Dichotomic | (1) Yes; (2) No |
| 2020_Sat05_CollTools | Do you think that the waste collection tools are sufficient in reference to the influx of people in the section of the historic centre? | Dichotomic | (1) Yes; (2) No |
| 2121_Sat06_Merchants | Do you think that the merchants of the historic center carry out a correct cleaning of the areas surrounding their business? | Trichotomic | (1) Yes; (2) Not enough; (3) No |
| 2222_Beh01_Trash | You've just finished eating your sandwich, you have to throw away the paper, but walking around you can't find any trash. How do you behave? | Dichotomic | (1) For; (2) Against |
| 2323_Beh02_FullTrash | You found the trash, but it's already too full. How are you doing? | Dichotomic | (1) For; (2) Against |
| 2424_Beh03_Cigarette | You have just finished smoking your cigarette. How are you doing? | Dichotomic | (1) For; (2) Against |
| 2525_Beh04_Cocktail | What a nice refreshing cocktail! Unfortunately it's already finished. How are you doing? | Dichotomic | (1) For; (2) Against |
| 2626_Beh05_UncivFriend | Your uncivilized friend/colleague throws a handkerchief on the floor. How are you doing? | Dichotomic | (1) For; (2) Against |
| 2727_Beh06_NearestBin | If there was a sign telling you how soon you could find the nearest trash can, do you think it would encourage you to reach it? | Dichotomic | (1) For; (2) Against |
| 2828_Bel01_NumBasket | Do you think that a greater number of baskets could help discourage wrong behavior? | Dichotomic | (1) Yes; (2) No |
| 2929_Bel02_BinLitUp | If the bins were lit up, would you find them easier, particularly in the dark? | Dichotomic | (1) Yes; (2) No |
| 3030_Bel03_PresColl | Do you think that a greater presence of waste collectors for the city during the day and evening would discourage wrong behaviour? | Dichotomic | (1) Yes; (2) No |
| 3131_Involment | Would you like it if we took action on this problem? If yes, can we count on you? | Dichotomic | (1) Yes; (2) No |

Source: Our elaboration

This proposed research does not follow any pattern suggested by the scientific reading, but was structured according to the cognitive needs of the Municipality of Barletta. Thanks to the questionnaire submitted it was possible to study the behavioral ethnography of the subjects (Jessor *et al.*, 1996) gathering implicit information such as:

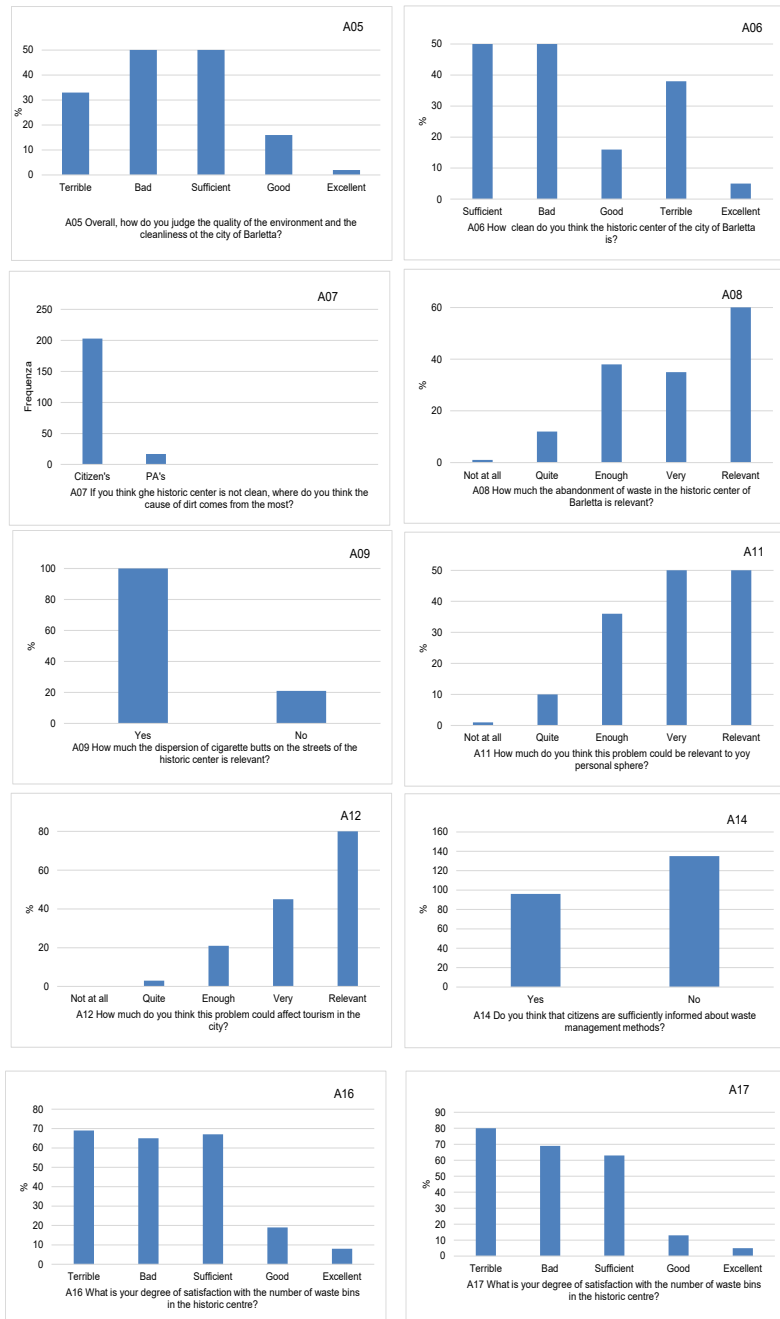
1. the perception of respondents regarding the general state of the environment (perception of the level of cleanliness, state of collection tools, perception of the problem) - 14 Items: 5, 6, 7, 8, 9, 11, 12, 14, 16, 17, 18, 19, 20, 21;
2. the attitude and the behavior of respondents towards the problem - 6 Items: 22, 23, 24, 25, 26, 27;
3. the triggers that would encourage respondents to adopt the desired behavior - 3 Items: 28m 29, 30;
4. the potential citizens' involvement in order to sort out the application of nudging strategy to the issue of reducing garbage and collecting cigarette butts - 1 Item: 31.

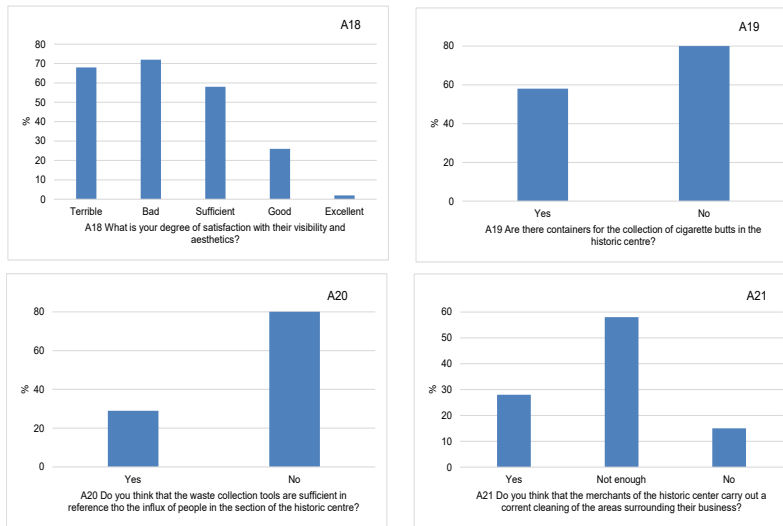
With respect to the first point (the perception of respondents regarding the general state of the environment), it is evident that the large majority of the citizens of Barletta negatively evaluate the aspects concerning the cleanliness and the order in their streets (Fig. 1).

Furthermore, an important paradox emerges: comparing the answers given through the item A07 (whose responsibility is it?) with those of A19 (are there enough waste bins?) and A20 (there are enough bins for collecting cigarette butts?), the respondents tend to blame on the behavior of citizens, rather than on the policies implemented by the PA but, at the same time, they judge the collection sites insufficient. This happens for complex problems, when the cause-effect mechanisms are interrelated and autocatalytic. In concrete, this aspect is an important signal of how useful a "gentle" approach, such as that of nudging, could be.

Analyzing the attitude and the behavior of respondents towards the problem (Fig. 2), while we record a preponderant predisposition of citizens to respect the environment, items 23 and 24 report less proactivity (item 23: the number of those who, despite seeing a refusal to road, they do not collect it) and a manifest problem for the release of cigarette butts in the appropriate wastebaskets, preferring to hide them in planters or throw them on the street (item 24). Maybe, there is a methodological limit concerning the difficulty of collecting information having an ethical profile on human behaviors, through direct interviews based on structured questionnaires (Hancock *et al.*, 2001; Qu and Dumay, 2011; Alshenqeeti, 2014). In these cases, an ethnomethodological approach based on the direct observation could help, even though the state of things (the degradation generated by behaviors contrary to the environment, with garbage left on the street) represents robust evidence of the generalized behaviors of a community.

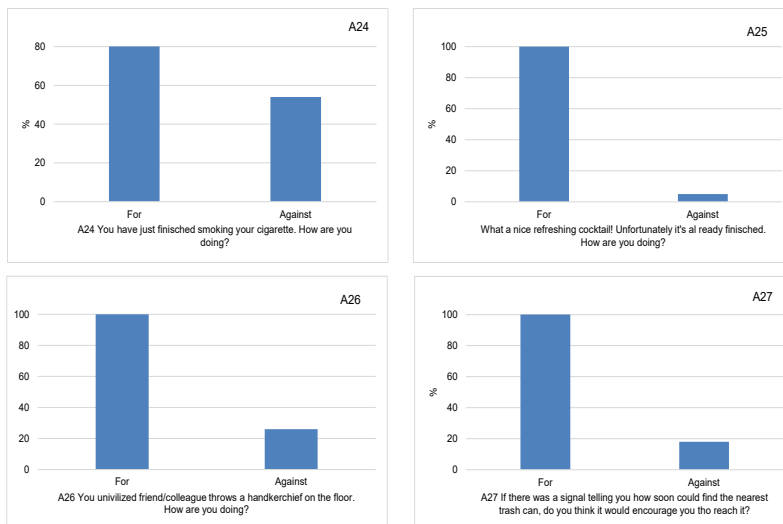
Fig. 1: The perception of respondents regarding the general state of the environment





Source: Our elaboration

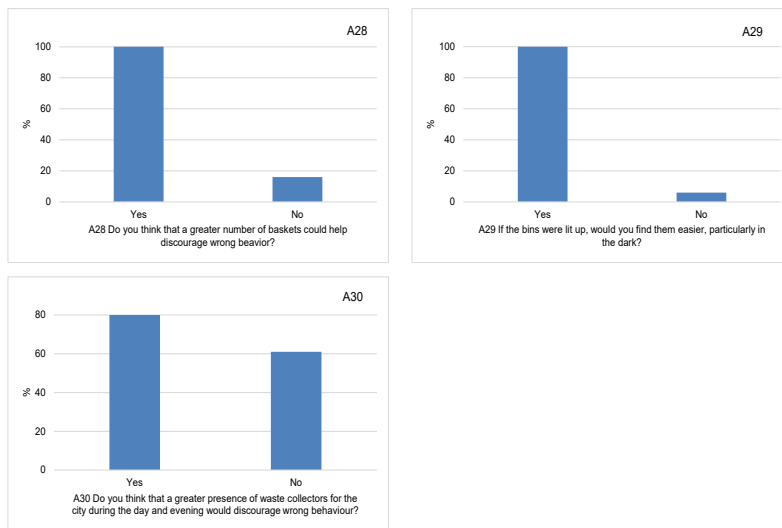
Fig. 2: The attitude and the behavior of respondents towards the problem



Source: Our elaboration

With regard to the question of which triggers would encourage respondents to adopt the desired behavior (see Fig. 3), first of all it emerges that a greater presence of waste collectors during daytime hours (item 30) does not return the same percentage of effectiveness compared to other actions, such as increasing the number of baskets (item 28) and making existing ones more visible (item 29). In particular, this last aspect represents one of the key aspects of nudging, where human behavior is triggered by psychological factors.

Fig. 3: The triggers that would encourage respondents to adopt the desired behavior



Source: Our elaboration

Finally, regarding the involvement of the respondents to the nudging project, out of the 231 interviewed, 208 of them (90%) showed interest, compared to 23 who showed indifference. As can be seen by reading the following paragraphs, the participation recorded in the experiment had been significant.

3.2 Baseline

After studying the behavior of individuals that are the main subjects of this project, the second step it's to analyze the context in which they act.

On Thursday, September 2nd, 2021, from 8:00 p.m. to 9:00 p.m., we carried out a Cleanup in the streets of the historic city center, collecting in special bags provided by the company Bar.S.A. Spa, the waste reported: a. glass, paper, and plastic, in the undifferentiated bag; b. cigarette butts, in a specific bag. The choice of day was indifferent for the window that runs from Monday to Thursday, due to the fact that every morning, ecological workers from the in-house waste collection company, Bar.S.A. Spa, carry out manual and mechanized cleaning of the city's historic center, thus restoring the situation of street cleanliness on a daily basis.

Conversely, the choice of a day on the weekend (including Friday) could have generated a bias on the longitudinal survey, as the flow of visitors tends to decrease from late August and early September.

The Cleanup event was attended by volunteers from the Retake Barletta association, and, to raise awareness about the problem, was opened to anyone interested (Fig. 4b), through word of mouth, the posting of posters (Fig. 4a), and announcements on the social channels of the project participants.

At the end of the clean-up, the bags collected were counted, reaching the following units:

- a. undifferentiated (beer bottles, plastic cocktail glasses and food wrappers): 4 bags from 110 liters;
- b. cigarette butts: 1 bag of 50 liters of 1, 82 Kg.

We use different unit of measures for the evaluation of undifferentiated and cigarettes collected.

For undifferentiated, we measured the waste collected in nr° of garbage bags filled, having the same capacity, because the variety of waste collected and placed in the undifferentiated, have different specific weight.

Due to this, we could not provide a comparable data using grams as the unit of measurement, that will be so vitiated by error due to the different weight that the filled bags may have in proportion to the type of waste that is placed inside (e.g., full or empty can). While, for cigarettes the unit weight is almost the same between the different brands and therefore comparable through the method of the before/after.

Fig. 4a: Clean up event posters (left) - Fig. 4b: Clean up event attendees (right)



Source: Our elaboration

At the end of the clean-up we were able to assess how, despite the fact that our work took place following Bar.S.A's daily collection service and in the early evening hours, when the historic center was still not crowded of people, the amount of abandoned and collected waste was significant.

Collecting trash along this route, allowed us to identify the “dirtiest” areas and place the Nudge tools in the optimal way possible.

3.3 Application of Nudging

After processing this data, we came up with the nudge strategy that best helps to achieve the set goal and we analyzed the impact of this strategy as a littering management policies solution and argue if nudging was an highly effective way of influencing behaviors without resorting to coercion or potentially regressive taxation (Hagmanet *al.*, 2015).

The basis for these ideas is the Fun Theory whose philosophy believes that the easiest way to change people's behavior for the better is to make things fun to do (Takahashiet *al.*, 2020). Basing on this theory, on September 03-04, Nudging tools made with the help of SGmetal and Retake Barletta,

were installed in previously identified and monitored areas. Specifically, we have:

- restored visibility to the bins already present in the historic center, by identifying them with likeable posters representing historical and important characters for our city acting for social sustainability, and painting green footprints on the ground to highlight path to reach them (Fig. 5a);
- installed nr°2 glass baskets made from recycled car tires and highlighted them by using green color and footprints to reach them (Fig. 5b);
- installed nr°2 baskets for differentiate plastic and paper. The game requires you to score your waste and trash it correctly by hitting the basket. A fun way to entice people to sort their waste (Fig. 6a);
- installed nr°5 cigarettes holders, made from the old lights of football stadium. The invitation to put out the cigarette comes from the curiosity to make a choice and express a preference. Next to the pubs have been placed the cigarette holders containing the poll of preference between Beer-Wine or Gin Tonic-Spritz while, near to the restaurants have been placed the poll concerning food preference, for example: Spaghetti with mussels-Orecchiette pasta with vegetables (Fig. 6b).

Fig. 5a: New restyling to existing baskets (left) - Fig. 5b: Glass baskets with pneumatic (right)



Fig. 6a: Paper/Plastic Basket (left) - Fig. 6b: Cigarette holder (right)



Source: Our elaboration

3.4 Checking and comparing

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Through the monitoring activity we understood how effectively the Nudging tools were received by citizens and how much they have been used actively and correctly:

- Paper/plastic baskets were the most successful tools, during monitoring days, were always full and properly used (Image 7.a-b-c-d-e-f).
- The glass baskets, provided positive results, but not to the same extent as the basketball baskets, for which, the invitation to play caused greater results. The disadvantage of the glass basket was probably its excessive height, and its non-transparency, which, by not allowing to see inside, could make the usefulness of the basket misleading and not obvious. In addition, Bar.sa encountered problems, during the daily cleaning of the operators, due to the excessive depth and weight of the glass (Image 8.a-b).
- The cigarettes holders have been used and highly appreciated especially by young people. They have a very easy emptying method and do not require daily cleaning, due to their capacity (Image 9.a-b-c).

Fig. 7 a-b-c-d-e-f. Monitoring Paper/Plastic Basket



7.a)



7.b)



7.c)



7.d)



7.e)



7.f)

Source: Our elaboration

Fig. 8.a-b. Monitoring glass baskets



8.a)



8.b)

Fig. 9.a-b-c. Monitoring cigarette holder



9.a)



9.b)



9.c)

Source: Our elaboration

4. Results

The results regarding the success and usefulness of the tools, were made available in the Final Clean up step.

On September 13th, with the same operational intervention group, as on September 2nd, we carried out, on the same route, and at the same time, the final clean up, to assess the benefits or not of the experiment, in terms of bags and cigarettes collected.

At the end of that operation, the bags collected were counted, reaching the following Tab units:

Tab. 3: Evaluation of results with before-and-after technique

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| | Differences in collected waste | | Differences |
|------------------------|---|---|---|
| | No Treatment (mean) September 2nd | Treatment (mean) September 13th | |
| Undifferentiated waste | 4 Bags from 110 Liters | 2 Bags from 110 Liters | A reduction of ~50% of waste collected before |
| Cigarettes in Kg | 1 Bag from 50 L of 1, 82 Kg | 1 Bag from 50 L of 1, 17 Kg | A reduction of ~36.45% of cigarettes collected before |
| Cigarettes in number | $(1820g - 36,9g) / 0,2g = 8915,5$ units | $(1170g - 36,9g) / 0,2g = 5665,5$ units | |

Source: Our elaboration

In order to compare the two stages, we transformed the weight of the envelope from Kilograms into grams and stripped it of the specific weight of the envelope equal to 36.9g. We divided the net weight with 0.2g corresponding to the specific weight of a cigarette butt, obtaining approximately the number of cigarettes collected.

The results compared before and after the application of the Nudges, showed the reduce of 36, 45% of cigarettes collected and mean the 50% of undifferentiated. This data made us realize how much the inputs were used, in their capacity and usefulness. Even the merchants of the businesses on the route, during the routine clean up before closing time, pointed out a marked decrease in litter abandoned near their establishments and a change in attitudes of young people who lives in the area. The difference in the effect of nudging found for the two behavioral categories (littering and discarding cigarette butts) may depend on different factors, both in terms of frequency (high in cigarette consumption) and psychologically, in terms of the assessment of the environmentally harmful effect of the gesture (low in discarding butts).

A great achievement was also getting citizens to approach Nudging for the first time, who welcomed the novelty with curiosity.

With these achievements we have in a small way created our own space in the minds and consciousness of citizens. For it to work and reap lasting results, however, this space needs to become larger by applying nudging strategies on an ongoing basis as a stable social policy.

5. Conclusion

With the use of Nudge as social policy, we create a more conscious relationship between citizens and the environment, stimulating a super-effective alliance with PAs to implement the reduction of waste abandonment in urban settings.

The observation of a high level of commitment from both the volunteers who participated in the experiment and the local traders who manned the stations, as well as the interest of the Municipality of Barletta in planning

the different phases of the experiment with the research group, allow us to formulate a positive answer to Research Question 1 (Can nudging be used by Municipalities to promote the reduction of littering behavior?). Indeed, when for the activities of waste removal and prevention is used taxpayer money, the problem of litter can constitute a challenge for PAs, also of a financial nature and also presents economic, environmental and health implications:

- the money spent on litter removal activities could in fact go to other sectors such as infrastructure, education and job creation;
- the materials that become abandoned waste take on a recycled value which, in so doing, is lost, leading companies to use more expensive virgin materials;
- abandoned waste is not liked. They could drive tourism away from our cities and this has an evident negative effect on employers' sources of income and workers in the tourism sector (Lemma, 2014);
- as it comes from research (Heck, 2020) polluted environments make people feel insecure and are associated with higher rates of antisocial behavior and crime. Experiments reveal that people feel less guilty of abandoning waste in an environment that is already polluted with respect to a clean environment⁶.

In the light of the research collected on Nudge and the experiment carried out, a great goal would be to direct the government to support the use of Nudge strategies for improving the survival probability of the territory system from a sustainability perspective (Barile *et al.*, 2018).

This approach is based on the assumption that citizens as consumers of social services need to be educated in a post-modern world (Bonfanti and Brunetti, 2015).

As a result, this nudge experiment as other implementation of recycling and waste management programs is likely to increase organizational efforts and therefore temporary costs, but can involve costs long-term savings (Abrate *et al.*, 2015).

Based on the results of the experiment (see Tab. 3), the answer to RQ2 (How effective is nudging in reducing littering?) can only be positive. A reduction of litter by 50% and of cigarette butts thrown on the street by about 36% is an important result to reflect on. Moreover, as natural experiment, the strength of this research lays on the fact that residents were unaware of the research experiment, so increasing its ecological validity (Merkelbach *et al.*, 2021).

We are also aware of the limitations of this work.

First, there is the objective limitation that the results relate to an example of nudging to reduce cigarette use and littering in the streets and that caution should be exercised in generalizing the results to other contexts. Indeed, one of the main limitations of nudge in the field of sustainability and environment protection is that it operates by influencing intuitive and non-decisional processes of individuals. And the individuals' mindsets are

⁶ Rapid Evidence Review of Littering Behaviour and Anti-Litter Policies. <https://www.zerowastescotland.org.uk/sites/default/files/Rapid%20Evidence%20Review%20of%20Littering%20Behaviour%20and%20Anti-Litter%20Policies.pdf>

shaped by context, coming to create an autocatalytic process: the more I pollute, the dirtier the context becomes; the more the context is dirty and more polluted (referring to the Broken Window Theory of Kelling and Wilson, 1982). But, although this makes nudge a possible strategy to change the behavior of people who have little engagement with the sustainability discourse, there is a growing consensus that “the best interventions will surely be those that seek to change minds alongside changing contexts” (Dolan *et al.*, 2012).

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Furthermore, in this paper we do not use methods to estimate the effectiveness of nudging compared to other techniques in waste disposal. Experts seem to agree that nudges are a complement to traditional policy instruments rather than a substitute for coercive (laws and regulations) and economic instruments (e.g., fiscal incentives, subsidies, taxes or fees). Nudge is not seen as a panacea, but seems to contribute mainly to better design of other initiatives and to improve the effectiveness and efficiency of policy instruments and the speed of their implementation (Avineri and Goodwin, 2010).

Thirdly, we do not calculate the net benefits to Municipalities by using nudging, considering the full cost for its implementation. Future research should therefore also address public policy makers, where regulation and budgeting will continue to be important factors influencing policies and interventions that could promote cost-effective behavioral changes with potentially high environmental benefits. In this perspective, econometric models and Structured Equation Modeling techniques could be adopted.

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Mutuality in the credit business of the banking enterprise: the cooperative credit survey

Received
27th February 2023

Revised
28th September 2023

Accepted
23rd November 2023

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Abstract

Frame of the research: *Inspired by the stakeholder value model more than the shareholder value model, cooperative credit banks (CCBs) are enterprises that aim to generate profits to sustain their business for the benefit of the community, rather than profit-making alone being the overriding goal guiding their actions. (Ayadi et al., 2010).*

Purpose of the paper: *This paper seeks to investigate whether the loan pricing decisions adopted by mutual banks are consistent with their objectives in terms of mutuality. We focus on how banks take into account the actual riskiness of borrowers in their lending activities, and hypothesise that the evidence of cross-subsidisation, in terms of interest rates charged, between high- and low-quality borrowers is consistent with the nature and objectives of cooperative credit banks.*

Methodology: *The investigation into lending behaviour focused on an examination of pricing policies and was conducted in the form of an empirical analysis concentrating on the comparison between the interest rates applied in 2020 by four Italian CCBs working in the same geographical area, and the theoretical interest rates, consistent with the risk level of the counterparties.*

Findings: *The results show that the pricing adopted by the cooperative banks that were examined is partially decoupled from the risk level of the loan granted to the counterparty. The application of less favourable conditions to the best borrowers and more favourable conditions to the worst borrowers constitutes a credit pricing system that can be defined as mutual.*

Research limits: *Like all such work based on an analysis of case studies, the research has limitations which are a consequence of the potential lack of representativeness of the phenomena observed. This concerns the number of intermediaries in general, and, specifically, the technical form of lending (opening a line of credit within a current account), which does not cover all types of credit line relationships, and the observation period, which is limited to the year 2020.*

Practical implications: *The setting of rates on loans to customers is an effective lever that cooperative banks can use from a strategic point of view, in the context of mutual credit management.*

Originality of the paper: *By using proprietary data from the banks examined, the work represents the first attempt to understand whether the credit policy of cooperative credit banks, which manifests itself most notably in the setting of lending rates, is consistent with their cooperative nature and with the values of solidarity on which their actions have historically been based.*

Key words: business model for sustainability; mutuality; stakeholder value; cooperative credit banks; credit pricing

1. Introduction

Crises over the past decades, as well as the ongoing focus on sustainability issues, highlight the need to innovate corporate business models so as to increase the resilience of companies and their ability to survive in the new competitive environment (Ferlito and Faraci, 2022). Sustainable innovation is a fundamental lever for change that affects all businesses and industries, and it involves designing business models which are suited to the changing needs of stakeholders, customers, and the environment inside and outside the company (Freeman, 2010). Accordingly, innovators focus on exploring opportunities to design a new business model that creates value for all stakeholders, respects the environment, and leads to long-term sustainability. This involves the creative integration of business and sustainability concepts to create a model that is economically viable, socially responsible, and environmentally friendly (Bocken and Short, 2016). This innovation process includes assessing current models, understanding customer needs and preferences, identifying opportunities for improvement, creating products and services consistent with social and environmental challenges, and evaluating the results (Osterwalder *et al.* 2005). Following a variety of approaches (circular economy, open innovation, collaborative consumption), the adoption of innovative and sustainable business models helps organisations reduce their environmental impact, remain competitive in the market, attract and retain customers and employees, and create long-term value (Schaltegger *et al.*, 2016; Foss and Saebi, 2017; Zott *et al.*, 2011).

Banks are among the companies that are most committed to supporting sustainability. For Yip and Bocken (2018), they play a crucial role in sustainable development because they assess risks and put a price on the ones taken in the credit approval process. Regardless of their ownership and capital structure, banks must perform well to maintain business integrity and stability. However, for a particular category of banks, namely cooperative credit banks, profit maximisation is not the main objective, as their primary purpose is to foster the economic, social, and cultural development of their members, customers, and the community in which they operate (Minto, 2016). Cooperative credit is inspired by the banking model known as Stakeholder Value Bank (STV), which differs from the so-called Shareholder Value Bank (SHV), in which management acts primarily in the interest of shareholders by maximising return on equity. By adhering to the STV approach, cooperative banks aim to generate profits to co-create value by balancing the different interests of the various stakeholder categories (members/customers/reference communities) and adopting a long-term perspective (Casadesus-Masanell and Ricart, 2011; Chesbrough *et al.*, 2011; Gambardella, 2014; Casprini, 2015). They do not, therefore, consider profit as the overriding goal driving their actions (Ayadi *et al.*, 2010), rather it is a means to safeguard business continuity, growth, and the achievement of the social objectives that underpin their corporate mission. This is because cooperative banks aim to satisfy the needs of their members rather than pursuing maximum profitability. Their democratic structure assigns equal voting power to all members, regardless of their

invested capital (Bergoing and Piguillem, 2022). These are banks that adopt traditional rationale aimed at creating value for stakeholders (Coco and Ferri, 2010).

This category of banks contrasts with traditional banks, whose main objective is to create value for shareholders, and which typically include commercial banks and investment banks. While a commercial bank provides relatively standardised money management services (e.g. deposit, payment, financing, investment in financial markets, etc.) through a mechanism known as 'credit creation' (Anand and Mantrala 2019), to a clientele which tends to be heterogeneous in nature and size (e.g. to individuals, for-profit and not-for-profit companies, public entities, etc.), the activities of an investment bank focus mainly on investments, management of financial instruments and, more generally, on complex financial transactions involving large corporations.

The characteristics of cooperative banks (CCBs) can be found in their credit supply, which is the core of their activity. Their small size and territorial approach favour the adoption of strategic choices based on relationship and information advantage (Baccarani *et al.*, 2013; Caridà *et al.*, 2015; Buffa *et al.*, 2019), but at the same time, they make cooperative credit more exposed to the 'risk of capture' by elements found in the local context (Becchetti *et al.*, 2016), as well as being more sensitive both to regulation, when the regulatory framework does not adequately apply the principle of proportionality (Schenkel, 2017; McKillop *et al.*, 2020), and to technological innovation, which requires substantial investments that are difficult for banks to sustain on an individual basis (Arner *et al.*, 2017; Ferri, 2017; D'Onza *et al.*, 2021).

In this scenario, competition, regulation, and technological development have favoured the evolution of a banking business model. This then led to the implementation of a process of business model innovation, which, while considered the new driver of competitive advantage (Casprini, 2015), cannot overlook the fact that the challenge for traditional cooperative bank lending is to generate sufficient profits to ensure adequate levels of profitability, while respecting sound and prudent management and mutualistic principles. The application of price leverage on loans must consider the elements of credit risk appropriately, therefore, without compromising the fiduciary relationship with customers and the reference community.

In line with the considerations outlined above, this research employs case study methodology to investigate the lending policies of four cooperative banks, in order to verify whether and to what extent there is consistency with the aims of cooperative credit. Loan pricing is one of the ways in which mutual banks distribute the value they create to their members and, more generally, to the territory in which they operate. By comparing actual (applied) pricing and theoretical pricing (so-called risk-adjusted pricing), this study aims to verify whether the mutuality of CCBs finds expression not only in their charitable interventions in favour of volunteering and associations but also in the granting of loans to customers.

The study's originality can be found in its investigation of the pricing of loans, adopting an innovative approach, differing from the studies to date

that have focused on the factors that guide banks' choices in setting interest rates. The emphasis is not on an analysis of the pricing determinants in search of a model that best serves the interests of the various stakeholders, instead, this study aims to verify whether the setting of lending rates constitutes a lever that cooperative banks use to achieve a mutual type of credit management.

The results seem to confirm that the principle of mutuality can inspire the provision of credit by CCBs. Compared to the theoretical rate they would have to apply if they priced the credit risk correctly, they apply slightly higher rates to more deserving customers while charging lower rates to less virtuous customers. In this way, mutuality in lending translates into charging the good borrower more (compared to the theoretical or ideal rate) and charging the less virtuous borrower a lower rate (compared to the ideal rate). In this regard, the average loan rate is the result of the calibrated pricing applied to customers with different risk profiles. The conscious pursuit of mutuality in the granting of loans defines the bank's competitive positioning and how it undertakes its commercial development actions, following the principles of cooperative credit.

This work provides valuable guidance to academics, managers, and policymakers on the sustainability of adopting such practices in the granting and pricing of credit. It is structured as follows: section two contains a review of the literature on the unique characteristics of cooperative credit banks and the relationship between lending, pricing, and the sustainability of the cooperative credit business model; section three presents a description of the methodology used in the empirical investigation of the banks surveyed; the analysis of the results in section four is preparatory to discussion of the findings (section five), and the concluding remarks contained in section six.

2. Literature review

According to Ayadi (2019), the business model of financial intermediaries can be understood to be how they manage their assets and liabilities in order to contribute to the functioning of the economic and financial system, primarily through the management and/or transfer of risk.

The central elements are asset and liability management on the one hand, and risk management on the other. Concerning the first point, the business model of mutual intermediaries differs from that of banks, which focus more on making money. This is due to the difference in the weight of credit intermediation, and the nature of the parties involved in funding and lending relationships.

Following the Business Model Canvas proposed by Osterwalder and Pigneur (2010), the value proposition aims precisely at meeting the needs of a specific customer segment. Similarly, in the context of a CCB, the value proposition is linked to the direct support given to the local economy through the provision of a wide range of banking products and services that are designed to be particularly beneficial to the local community. Just as in

the Osterwalder model, customers are at the centre of the CCB business model; consequently, the target audience includes not only customers with a low risk profile, but also those with a higher risk profile.

Where risk management profiles are concerned, determining the interest rate applied to loans granted to customers represents a fundamental tool for managing credit risk and transmitting the bank's commercial policy. In the framework of risk assessment and pricing in the lending process, banks participate by promoting, or not promoting, sustainability (Jeucken, 2010).

Relative literature has conducted extensive investigations into the financial support that cooperative banks provide to firms and households in the local areas where they operate. From a theoretical point of view, the objectives and characteristics of cooperative banks imply both advantages and disadvantages in terms of providing credit to the economy. On the one hand, their small size and territorial approach should favour lending relationships through a more effective reduction of information asymmetries (Petersen and Rajan, 1994; Berger and Udell, 1995; Berger *et al.*, 2004; Elsas, 2005; Bonfanti, 2009; Maizza *et al.*, 2012; Kysucky and Norden, 2016; Beck *et al.*, 2017); on the other hand, small banks which concentrate their operations at local community level may suffer from inefficiencies linked precisely to their small size, and be more exposed to the 'risk of capture' by the local political and business environment (the dark side of relationship credit according to Becchetti *et al.*, 2016).

The information advantage enjoyed by cooperative banks and their close relationship with the territory translate into an improved ability to select and monitor so-called "opaque" borrowers, including SMEs (De Bruyn and Ferri, 2005). By studying the consequences of the presence of cooperative banks on long-term local growth, Usai and Vannini (2005) found that intermediaries of this kind are better suited to provide funds to local firms. Moreover, their superior ability to collect and manage soft information compared to other types of banks has led to a lower impact on the availability of credit provided by cooperative banks during periods of financial crisis (Ferri *et al.*, 2014; 2017). Minetti *et al.* (2021) examined the role of these intermediaries in reducing income inequality, emphasising the mutualistic nature of their activities in fostering the socio-economic development of the territory.

Studies on loan pricing are less numerous. In general, the way banks set loan rates is embedded in a theoretical framework that dates back to the work of Ho and Saunders (1981), later extended by Angbazo (1997) and Gambacorta (2004), and, more recently, by Camba-Mendez *et al.* (2016) and Camba-Mendez and Mongelli (2021). According to this approach, the profit margin on funding and lending activities depends on the degree of risk aversion, the market structure in which the bank operates, the average size of transactions, the volatility of money market rates, and the risk of insolvency of the borrower, which is the focus of the empirical investigation in the next section.

In general, when deciding on the conditions applied to lending and funding, a bank must mediate between two opposing interests: that of the providers of funds (creditors of the bank), who expect the highest possible return from the resources they invest, and that of the borrowers of funds

(debtors of the bank), who instead express a preference for minimising the cost of the funding received. In the case of mutual banks, the creditors and debtors of the credit union are predominantly, though not exclusively, members of the institution, and this is relevant from the point of view of credit pricing, which is of interest herein.

Several studies on American credit unions, which have collection and lending relationships exclusively with their members, have empirically verified the orientation of these institutions in favour of their creditors and debtors, finding that they are prevalently neutral, which represents a choice that is consistent with the objective of attracting new members of both types (Flannery, 1974; Smith, 1986).

In contrast to American credit unions, cooperative banks also have non-member customers, which introduces further complexity in the attempt to balance the interests of different stakeholders. Emmons and Schmid (2002) find that the pricing policy of cooperative banks is determined not only by the preferences of customers who are members, but also by the volume of business involving non-member customers. The cooperative's incentive to lend on better terms to counterparties increases as the volume of business with member customers increases. Catturani and Venkatachalam (2014) generalise the model of Smith *et al.* (1981), which described credit union pricing policies to account for the non-member counterparties' role in cooperative banks. The authors show that, when setting interest rates, cooperative banks should include a premium that takes into account the interest rate sensitivity of each of the types of counterparties, which stems from the combination of attributes related to participation (member/non-member) and the type of financial position vis-à-vis the bank (debtor/creditor).

3. Empirical analysis

3.1 Research aim

With regard to the limited number of previous studies which refer specifically to CCBs' pricing practices, this research aims to investigate whether the loan pricing decisions made by these banks are consistent with their objectives in terms of mutuality. We focus on the way banks account for the actual riskiness of their borrowers in their lending policy, and hypothesise that evidence of a cross-subsidisation, in terms of the interest rates charged, between high-quality and low-quality borrowers would be in line with the nature and aims of these mutual banks.

From this perspective, first we acknowledge that CCBs are perfectly able to assess this riskiness appropriately, given, on the one hand, the reduced information asymmetries and the typically long-lasting lending relationships highlighted within the literature discussed in the previous section, and, on the other hand, the widespread adoption of reliable, advanced models to measure bank credit risk exposure. Next, we hypothesise that their mutual nature might, to some extent, justify a certain disparity between the interest rate actually charged to their borrowers and

the interest rate that risk management models and practices would suggest, which we define as a risk-adjusted (or ideal) interest rate.

Overall, we expect pricing decisions made by CCBs to be consistent with the required, inverse correlation between borrowers' creditworthiness and the corresponding interest rate applied. Nevertheless, we argue that CCBs might charge interest rates that are not precisely the same as the risk-adjusted ones. In particular, they might set a lower price for their credit - with respect to the risk-adjusted one - for riskier borrowers, and a higher interest rate - again with respect to the risk-adjusted one - for less risky borrowers. This would result in cross-subsidisation which, although it may not be economically rational, would be justified in the light of their STV approach.

3.2 Methodology

From a methodological point of view, this investigation into the pricing policy implemented by cooperative banks is conducted by means of a comparison between the rate applied in the lending business (so-called "effective" rate or pricing) and a benchmark represented by the interest rate adjusted for counterparty risk (so-called "theoretical/risk-adjusted" rate or pricing). Bank loans are priced through a risk-based approach, resulting in an interest rate taking into account both a "technical part" and a "commercial part" (Hasan and Zazzara, 2006; Curcio and Gianfrancesco, 2011). The former accounts for the remuneration of both expected loss and unexpected loss that a bank faces in granting a loan; this includes two major elements that can be obtained using an internal rating model, namely the probability of default by the counterparty, and the associated loss rate the bank would experience, both estimated over a 12-month period. It also accounts for easy-to-find data, such as the costs of debt and equity for the bank. The commercial component consists of operational costs, commissions, and other subjectively allocated costs, which we choose not to consider since their allocation does not have any importance as far as credit risk management is concerned.

In formal terms, the risk-adjusted interest rate (P) applied to a €1 loan is estimated by applying a pricing formula derived from the following equation:

$$€1 \times (1+P) \times [(1-PD) + PD \times (1-LGD)] = (\epsilon 1 - PATR) \times (1 + TIT) + PATR \times (1 + r_e)$$

where the result of a €1 risky investment, characterised by a counterparty's established default probability over a 1-year time period (PD) and the corresponding loss rate for the bank (LGD), on the left-hand side, is equal to the result of the investment of a sum given by the difference between €1 and the amount of equity that the bank must set aside against this €1 loan ($PATR$) at the bank's cost of debt (TIT) plus the result of the investment of $PATR$ at the bank's cost of equity (r_e), on the right-hand side.

The formula assumes a 1-year time period and intentionally disregards the cost and commission components of the commercial part of the loan pricing and allows P to be calculated as follows:

$$P = \frac{TIT + (PD * LGD) + PATR * (r_e - TIT) + CO}{(1 - PD * LGD)}$$

where:

- P is the risk-adjusted (theoretical) interest rate applied to the loan;
- TIT is a proxy for the bank's cost of debt;
- PD (probability of default) measures the probability of default of the counterparty;
- LGD (loss given default) is the loss rate in the event of the counterparty's default;
- PATR is the amount of equity that the bank must set aside against the loan granted (as a percentage of the value of the loan itself) under prudential management;
- r_e measures the bank's return on equity, and is a proxy for the cost of equity set aside against the loan (PATR);
- CO indicates the operational costs and commissions to issue the loan, which are disregarded since they have no relevance in the perspective of credit risk measurement and management.

The product of PD x LGD represents the expected loss rate, which the bank covers through provisions for the deterioration of the quality of its loan portfolio. Compared to other risk-adjusted pricing models, the above formula does not include the EAD (exposure at default), which measures the value of the bank's exposure in the event of counterparty default and is assumed to be equal to 100 percent of the amount lent. Unlike the risk-neutral approach, the risk-adjusted approach adopted in the calculation of theoretical pricing introduces the more realistic assumption of risk aversion by the intermediary, incorporating not only the expected loss but also the associated cost of economic capital. It is assumed that a loan of 1 euro is ideally financed by TIT for a share equal to $(1 - PATR)$ (e.g., for 90 cents) and equity (PATR) for 10 cents. In this way, the lending rate charged on loans also covers the cost of the capital that the bank sets aside under prudential supervisory regulations.

If adequately applied, risk-adjusted pricing should be able to avoid the value-destroying phenomena that result from setting lending rates that are poorly correlated to the risk of the loan. Risk-adjusted pricing should, therefore, reduce the probability of establishing uncompetitive rates for better-quality customers or lower-than-appropriate rates for customers with lower creditworthiness. Poorly risk-adjusted rates may give rise to cross-subsidisation, whereby some customer segments subsidise other customers by paying higher rates than those consistent with their actual risk and are charged lower interest rates than those consistent with their risk level. For a cooperative credit bank, cross-subsidisation, if desired and supervised, represents the application of mutuality in lending.

3.3 Sample description

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The empirical analysis considers the activities of four Italian cooperative credit banks with operations in the Northeast of the country, which were selected on the basis of their location in order to ensure the greatest possible homogeneity of their loan portfolios. Specifically, a judgmental approach was used to choose the banks, because they belong to the same cooperative group and present asset and financial data, including the granularity of the data on the loans granted, which allow us to conduct a better investigation into how consistent their credit policy is with the mission of the cooperative credit banks. The data used to feed the pricing model are taken from the banks' proprietary databases and integrated with market information to estimate the cost of equity through the capital asset pricing model (Sharpe, 1964). In order to determine the effective lending rate, the average of the rates charged by banks at the end of 2020 on current account loans was used (Table 1). The effective rates refer to the different rating classes (on a scale of 1 to 13) as provided by the management system. Corresponding theoretical interest rates were calculated for these 13 rating classes using the risk-adjusted pricing model described in the previous section.

Although the loans issued by the banks we examined predominantly take the form of mortgages, current account financing has the advantage of reducing, if not eliminating, the impact on the pricing of variables other than the counterparty's probability of default, namely the duration of the loan and the value of the asset pledged as collateral.

*Tab. 1: Lending activity of the banks in the sample
(Balance sheet data and interest rates as of 31 December 2020)*

| | 1 | | 2 | | 3 | | 4 | | Media | |
|-------------------------------|---------|--------|---------|--------|---------|--------|---------|-------|---------|--------|
| | volumes | rate | volumes | rate | volumes | rate | volumes | rates | volumes | rate |
| Current account financing * | 9,29% | 3,31% | 7,61% | 3,33% | 13,02% | 2,79% | 7,38% | 3,59% | 9,32% | 3,26% |
| Mortgages * | 74,92% | 2,03% | 65,67% | 2,22% | 67,53% | 2,21% | 66,20% | 2,13% | 68,58% | 2,15% |
| Receivables from customers ** | 49,93% | 2,19% | 51,83% | 2,30% | 47,99% | 2,35% | 65,16% | 2,28% | 53,73% | 2,28% |
| Securities portfolio ** | 43,99% | 1,31% | 44,41% | 0,84% | 41,36% | 1,38% | 28,37% | 1,00% | 39,53% | 1,13% |
| Loans to banks ** | 6,08% | -0,22% | 3,75% | -0,09% | 10,65% | -0,22% | 6,46% | 0,04% | 6,74% | -0,12% |

* as a percentage of total loans to customers; ** as a percentage of total interest-bearing assets

Notes: elaborations by the authors

4. Results

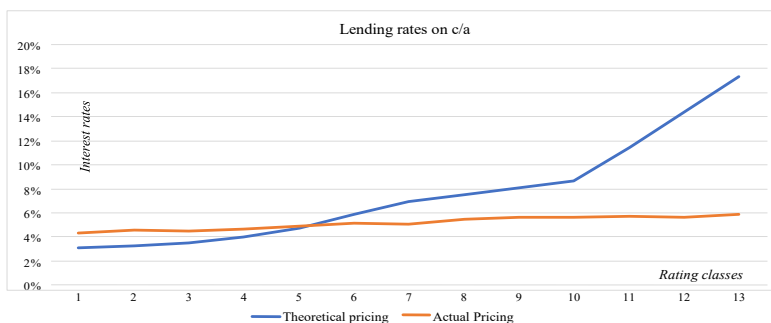
The results of the comparison between the theoretical and actual rates are presented in Figure 1, in which the y-axis shows both the effective (orange curve) and theoretical (blue curve) rates applied to a loan, and the x-axis shows the rating classes assigned to borrowers by the credit model of the banks in the sample. The counterparty risk level increases from left to right and is, therefore, lowest for class 1 (the best rating) and highest for class 13 (the worst rating). Figure 1 confirms a direct relationship between counterparty riskiness and the corresponding interest rate. In

particular, both curves show the expected upward trend from left to right: as the borrower's rating class worsens, the respective interest rate, both theoretical and actual, increases.

The two curves, however, have a different slope and consequently intersect at a point in Cartesian space between rating classes 6 and 7. Overall, the effective rate curve is less steeply sloped than the risk-adjusted rate curve. In particular, for rating classes 1 to 6, the theoretical rate is lower than the effective rate, while the opposite is observed for the following rating classes, between 7 and 13, where the creditworthiness rating gets progressively worse.

On analysing the rate curves to the left and right of the point of intersection, it is possible to observe that the misalignment between theoretical and actual pricing is also asymmetrical in terms of its size: in absolute value, the distance between the two rates is, on average, distinctly higher for the rating classes to the right of the point of intersection. Therefore, the cooperative credit banks examined charge the best (worst) borrowers with an effective interest rate that is higher (lower) than the theoretical rate. The absolute value of the differential between the rates progressively decreases moving from class 1 to class 5. Meanwhile, it increases from class 6 to class 13 with an intensity that, on the right-hand side of the graph, is affected by the significant increase in the slope of the theoretical rate curve (consistent with what is typically observed from the application of risk-adjusted pricing models).

Fig. 1: Theoretical (or risk-adjusted) lending rates and effective lending rates



Notes: elaborations by the authors

The results show that the rates applied by banks are higher for more deserving customers and lower for less virtuous customers, compared to the corresponding theoretical rates, effectively giving rise to the phenomenon of cross-subsidisation that a risk-adjusted pricing model would aim to avoid. When viewed from the perspective of a cooperative bank, however, the choices outlined may have a different basis. In line with the values of mutualism and financial inclusion, the bank in question intends to favour applicants requesting access to credit who have a relatively low merit ranking, by applying less penalising conditions than those that would be implemented should the counterparty's actual riskiness be considered in determining pricing. Meanwhile, the bank applies slightly less favourable

conditions to customers in the best rating classes, seeking to limit the price differential so as not to penalise the commercial relationship excessively.

The application of the actual rates to customer loans that are not aligned with theoretical rates results in four possible pricing options. Table 2, which considers two groups of borrowers (best vs. worst) and two types of rates (actual vs. theoretical), describes the objectives and impacts of applying each of the four pricing strategies: (1) actual rates (higher than theoretical) for the best borrowers and theoretical rates (higher than actual) for the worst borrowers; (2) actual rates (lower than theoretical) for the worst borrowers and theoretical rates (lower than actual) for the best borrowers; (3) actual rates equal to theoretical rates for all borrowers; and (4) actual rates different from theoretical rates for all borrowers. Each of these pursues specific objectives and impacts the volume and quality of lending differently. For example, in applying the first strategy, the bank maximises the risk-return ratio by charging the best borrowers a little more and pricing the worst borrowers correctly according to their risk. However, the reduction in lending volume is due to the possible departure of the best customers who are not satisfied with the conditions applied.

The CCBs surveyed do not apply optimal pricing policies when lending to customers, failing to differentiate their terms properly based on risk. Instead, their pricing policy places them in the situation represented in the last row of the table: the systematic application of actual rates that differ from the theoretical ones. This choice is not without potentially hazardous consequences for the stability of intermediaries. The poor differentiation of rates according to risk and, in particular, the misalignment described above, could favour an overall deterioration in the quality of the loan portfolio as it generates ‘adverse’ incentives in customers: on the one hand, it stimulates riskier borrowers to turn to the banks in question, rather than to intermediaries who, pricing their credit according to a risk-adjusted criterion, would ask them for higher rates; on the other hand, it encourages less risky borrowers to turn to other banks in order to obtain lower risk-adjusted rates than those proposed by the CCBs in the sample.

Tab. 2: Pricing policies and objectives of the bank

| Pricing policies | Objectives | Impacts |
|---|--|---|
| 1. Effective rates for the best debtors and theoretical rates for the worst debtors | Maximising the bank's money management contribution | It may improve the interest margin; however, it may lead to a reduction in the volume of loans due to the possible exit of better customers (not satisfied with the conditions applied), resulting in a worsening of the overall quality of loans |
| 2. Effective rates for the worst debtors and theoretical rates for the best debtors | Developing the volume of jobs | It can make commercial policy more effective due to the favourable terms offered to counterparties. Conversely, the risk of adverse selection, with its consequent impact on the overall quality of the loan portfolio, must be monitored. |
| 3. Effective rates = rates theoretical for all debtors | Apply the theoretical risk-adjusted rate for each risk class | The mix of impacts of policies (1) and (2) but a complete absence of mutuality |
| 4. Effective rates \neq rates theoretical for all debtors | Systematically applying effective rates | Full applicability of mutuality; however, potential negative impacts (cross-subsidisation) primarily if competitors use risk-adjusted pricing models |

Notes: elaborations by the authors

There are two responses to the criticism of adopting sub-optimal pricing policies.

The first is that adopting pricing policies that favour mutuality does not exclude, rather it reinforces, the importance of using robust creditworthiness assessment techniques. In other words, the mismatch between actual and theoretical rates is not accidental but is a strategic choice of the bank that decides to apply different rates even though it is aware of the indications deriving from risk-adjusted pricing models. With this in mind, the bank can change its strategy if market conditions, or its strategic objectives, should change.

The second is that the bank can mitigate the undesirable effects of suboptimal pricing policies by appropriately adjusting its credit risk provisioning policy. The adoption of the fourth strategic option should preferably be accompanied by higher provisions, which are easier for a cooperative credit bank to apply (all things being equal) than for a commercial bank that does not have profit maximisation as its primary objective, and on which higher loss provisions have a negative impact.

5. Discussion of result and implications

Determining lending rates on loans is one of the main applications of credit risk measurement models, mainly regarding the modelling developed to estimate the probability of default (PD) and the loss-given default (LGD) rate. Considering the above, the results of the empirical analysis show that cooperative banks apply pricing that is partially decoupled from the risk content of the loan provided to the counterparty. The application of less favourable conditions than those that would theoretically be calculated to the best borrowers and more favourable conditions to the worst borrowers establishes a credit pricing system that could be defined as mutualistic and adjusted to promote sustainability in the area of operations and within the reference community.

If it were a shareholder value (SHV) bank, this practice would not be rational and would be difficult to defend, as it is destructive with regard to shareholder value. A CCB, however, is not an SHV, and what is summarised in the graph can be defined as the result of a mutualistic approach to the granting of credit, which acquires its rationale precisely in the cooperative nature of cooperative credit banks. While respecting its identity as a community bank, a CCB is still a financial intermediary that must be robust in order to play its role in the territory and pursue its social objectives. With this in mind, it seems fitting to ask whether adopting pricing that is (partially) uncoupled from the indications resulting from a risk-adjusted approach is sustainable. No, if examined in isolation; yes, if, in light of the bank's overall management dynamics, it does not threaten the bank's stability.

Loan pricing, although important, is only one aspect of the overall management of credit and the risk associated with it. Mutuality in loan pricing becomes sustainable from a business point of view as long as the bank finds a way to compensate for the adverse effects of applying rates

that are not perfectly aligned with the risk of the counterparty: on the one hand, lower competitiveness concerning better customers; on the other hand, the underestimation of risk for worse customers. Lending to good-quality borrowers on less favourable terms than they would get if the bank priced the risk correctly is not a problem for the bank's management as long as the bank manages to keep the adverse selection mechanism described above under control and this does not lead to the loss of customers. In this regard, it is reasonable to assume that the customers of a cooperative bank, regardless of their membership, share its mutualistic ideals, appreciate its role in promoting the economic and social vitality of the territory, and that they believe that the value of these aspects can compensate for the sacrifice of an interest rate that is worse than what is due.

Where stability is concerned, underestimating risk is undoubtedly more significant. In this regard, the levers to be activated can only be found in a provisioning and capitalisation policy that allows for the recovery of the arbitrary margin the bank uses in setting a lower effective rate than the risk-adjusted one. The nature of not-for-profit banks, for which the profit motive is excluded by limits on profit distribution and the principle of indivisibility of reserves, the low appetite for speculative risk-taking and the low volatility of performance, provide a solid basis for creating robust capital buffers.

The abovementioned considerations refer to a static view of the comparison between risk-adjusted and actual pricing. However, the (partial) misalignment of the effective rate with the risk-adjusted rate also has interesting implications from a dynamic perspective. Compared to the use fully aligned to risk-adjusted pricing, adopting a somewhat risk-free mechanism may be consistent with a less procyclical, or even countercyclical, attitude of the practising intermediary¹. Following the business cycle, the risk-adjusted rate tends to be higher during economic downturns, when default probabilities increase, and lower when the economy grows, and default probabilities decrease. If pricing is (partially) decoupled from risk, it automatically becomes less stringent (than it should be) during slowdowns or recessions and more stringent (than it should be) during phases of growth.

Even in this dynamic perspective, the sustainability of the mutualistic approach to pricing necessarily passes through the actions of capital strengthening and adequate provisioning as mentioned above.

¹ In general, the term "procyclicality" describes the tendency to amplify fluctuations in the business cycle. With reference to the calculation of the capital requirements of banks, procyclicality is the phenomenon whereby, as a result of a general increase in counterparty riskiness during economic downturns, there is, all else being equal, an increase in capital requirements and, conversely, as a result of a lower perception of risk during upturns, a reduction in capital requirements. Capital requirements therefore adjust to take into account changes in counterparty default probabilities during different phases of the economic cycle.

6. Concluding remarks

Banks play a primary role in the pursuit of sustainable development within economic and financial systems. Due to their positioning as financial intermediaries in trade management, their activities involve not only the parties in the transaction but also multiple stakeholders. In assessing risks and allocating loan rates, banks promote sustainability by appropriately allocating financial resources to foster the economy's stability and prosperity over time (Jeucken and Bouma, 2017).

This study aims to test the application of the mutualistic approach and the sustainability orientation of cooperative credit banks in carrying out traditional lending activities. By analysing the lending policies of a sample of CCBs and, in particular, comparing the pricing applied to customers and that which should have been applied using a so-called risk-adjusted approach, the results of this work highlight that the banks in question do actually seem to adopt the principles of mutuality in the granting of loans, not limiting them to liberal contributions to the voluntary activities of the reference community. In our opinion, this study is innovative because it represents the first attempt to understand whether the credit policy of cooperative credit banks, one of its highest expressions of which is the setting of lending rates, is consistent with their cooperative nature and with the values on which their operations are based.

From a theoretical point of view, the study's main contribution consists in not limiting itself to investigating the factors underlying the definition of interest rates but in offering insights into the actual application of the principle of mutuality in granting loans to customers. Since lending constitutes the central core of intermediation carried out by commercial banks, the analysis of credit pricing confirms that the business model of CCBs is stakeholder value (STV) and not shareholder value (SHV).

Compared to the rate that would be established if CCBs priced credit risk according to the riskiness of the counterparty, they charge slightly higher rates on short-term loans to the most deserving customers while charging lower rates to customers in higher risk classes. In this way, mutuality in lending translates into charging a little more to the good borrower (compared to the theoretical or ideal rate) and a little less (again, compared to the ideal rate) to customers with less favourable risk profiles. This can be applied to the banks in question thanks to their comparative advantage of being STVs and, therefore, not as profit-maximising as SHVs. The option of not putting profit maximisation at the centre of their business model (Groenveld, 2015) allows cooperative credit banks to maintain solid capital and financial ratios, and to work on improving performance indicators while respecting the specific nature of being a cooperative bank with a mutual and social vocation.

From a managerial point of view, the conscious pursuit of mutuality in granting loans defines the bank's competitive positioning and how it undertakes commercial development actions in compliance with the principles of cooperative credit. Over the past decade, cooperative credit banks have seized the opportunity to build adequate capital reserves and improve asset quality and liquidity in compliance with regulatory

requirements. However, the path to prepare for the upcoming competitive challenges has not come to an end, it is moving towards an adaptation of the business model to generate sustainable positive returns. A virtuous cooperative credit bank could put into practise a kind of 'managerial resilience' in a transitional scenario, such as the current one. While waiting for economic recovery, the bank's objective could be to generate sufficient profits to avoid compromising profitability and capital endowment. A sort of 'minimum wage' that the CCB must achieve in order to earn a fair profit that can repay the risks it takes, without reducing capital coverage, and continue to support social and cultural initiatives in the area of operations. In other words, resilience would allow it to continue to be a community bank without activating the price lever, which could compromise the fiduciary relationship with customers and impoverish the territory.

In terms of policy implications, studying cooperative banks' loan pricing decisions makes it possible to achieve a greater understanding of the role of these banks within the economy, in the light of their mutual nature. In this perspective, we contribute to the debate about the importance of the lending activities of CCBs as a feasible contribution to a more inclusive financial system. It is, of course, important to mitigate the shortfalls in the business model of cooperative banks, especially those regarding their governance. This has led the Italian Government to reform Italian CCBs and "Banche Popolari", aiming to address the structural weaknesses of these banks with regard to their efficiency and organisational framework. Nevertheless, it is fair to say that these legislative interventions will only be considered successful if they can also safeguard the specific nature of mutual banks and strengthen their role as stakeholder value institutions, for example, by letting them handle the customer cross-subsidisation that this research has emphasised as far as the definition of loan interest rates is concerned.

The limitations of the study, which stem essentially from the case study approach that was adopted and which are substantiated by the potentially low representativeness of the phenomena observed, create opportunities for future research. Acknowledging the limits of the sample, therefore, and its compatibility with the availability of proprietary information on the rates applied, future work could try to broaden the study so as to understand whether other banks representing the cooperative credit system (in other geographical areas, and with different income and asset profiles), also pursue the principles of mutuality in their credit intermediation activities by intervening on the rates charged. Another limitation concerns focusing on only one technical format, i.e., current accounts. Although this choice is guided by the rationale that it is easier to understand the effects of a one-period pricing formula, future research could consider other technical formats to verify the extension of the mutualistic approach to the entire credit chain, rather than just considering part of it. Lastly, a third limitation concerns the quantitative methodology adopted, which could be affected by the temporal and spatial content taken as a reference for the study. This could be mitigated by enlarging the time series, especially if this means including cycles and phases characterised by different economic (expansion/recession) and monetary (rising/falling rates) conditions.

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sinergie
 italian journal of management

ISSN print 0393-5108
 ISSN online 2785-549X
 DOI 10.7433/s122.2023.07
 pp. 151-169



Italian Society of
MANAGEMENT

Exploring the relationship between attendees' motivation, satisfaction and loyalty in the context of a home-grown festival¹

Received
18th January 2023

Revised
14th March 2023

Accepted
21st September 2023

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Abstract

Frame of the research: Festivals are events with significant place-related meaning; they play an important role in the tourism industry. Consequently, scholars are increasingly interested in exploring their impact on local economies and on the competitiveness of tourism destinations, not to mention how social and environmental fields are affected.

Purpose of the paper: This study addresses the topic of home-grown festivals, which help to promote local cultural heritage; they also have a social significance beyond tourism. Specifically, this study explores the relationships between attendees' motivations, satisfaction and loyalty.

Methodology: Data were collected from 227 participants at the Maiorchino Festival, which is performed annually in an ancient town in southern Italy. This festival has been handed down over time; it is a local cultural tradition based on a typical product of the area, the Maiorchino cheese. A principal component analysis, a multiple linear regression and three logistic regressions were performed to test the hypotheses.

Findings: The analysis reveals that, contrary to previous studies, festival satisfaction affects destination loyalty, but not festival loyalty. It also confirms that several motivational factors affect perceived satisfaction with the festival, and that socialization as well as experience of local culture are motivations that influence festival loyalty.

Research limitations: Since we analyzed a single case study, the results may lack generalizability. Therefore, further research is encouraged to test the hypotheses within other festival contexts.

Practical implications: This study provides several insights for local managers on how to exploit home-grown festivals as effective marketing tools to expand tourism flow and destination loyalty to small towns, by improving the overall satisfaction in attendee experience.

Originality of the paper: This study further develops the findings of previous research on home-grown festivals, showing that, contrary to previous studies, attendees' satisfaction affects destination loyalty, but not festival loyalty.

Key words: home-grown festival; cultural heritage; motivation; satisfaction; festival loyalty; destination loyalty

¹ Though this paper is the ultimate outcome of a joint effort, it is possible to ascribe sections 1, 2, 5, 6 to Sonia Caterina Giaccone and sections 3 and 4 to Marco Galvagno.

1. Introduction

Festivals are public celebrations with significant place-related meaning (Chen *et al.*, 2019; Ma and Lew, 2012), concerning themes such as music, visual arts, crafts, food, traditions, which are performed periodically and for a limited period of time (Getz, 1991; Grappi and Montanari, 2011).

They have attracted increasing attention from scholars for their implications in the economic field, as well as in tourist, environmental, political, local cultural heritage and social fields (Castellani *et al.*, 2016; D'angella *et al.*, 2021; Getz and Page, 2016; Wilson *et al.*, 2017).

In this study, our attention is focused on a specific type of festival, the home-grown festival, which has been defined as “essentially small-scale, bottom-up and run by one or more volunteers for the benefit of the locality” (O’Sullivan and Jackson, 2002, p. 331). These festivals primarily aim to achieve cultural and/or entertainment benefits for residents and visitors, rather than economic goals (O’Sullivan and Jackson, 2002). The local community is directly involved in both organizing and participating in the festival (Mair and Duffy, 2021), thus, home-grown festivals are also known as “community festivals” (Li *et al.*, 2009; Qu and Cheer, 2020). They are sometimes also referred to as “local heritage festivals”, when based on culture, traditions, and habits located in the area where the festival is performed (Alexiou, 2019; Ma and Lew, 2012). Even if these types of festivals are mainly attended by residents and visitors from Regional surrounding areas, they are a great opportunity to shed light on local tangible and intangible cultural heritage and to pass it on (López-Guzmán and Santa-Cruz, 2016).

To date, literature has mainly addressed large-scale festivals (Crompton, McKay, 1997; Song *et al.*, 2019) rather than small-scale ones (Lee and Hsu, 2013; Mair and Duffy, 2021), and home-grown festivals even less so (O’Sullivan and Jackson, 2002; Li *et al.*, 2009).

Within current literature on festivals, several research issues have been explored, including: festival competitiveness and impacts on the host destinations (D’Angella *et al.*, 2021; Teixeira *et al.*, 2019); attendees’ segmentation (Formica and Uysal, 1998; Hsu *et al.*, 2023; Lee *et al.*, 2004); attendee characteristics, motivations, behaviours, satisfaction and loyalty (Báez-Montenegro and Devesa-Fernández, 2017; Choo *et al.*, 2022; Ho *et al.*, 2022; Johansen and Mehmetoglu, 2011; Payini *et al.*, 2022; Pope *et al.*, 2017).

With reference to home-grown festivals, some studies explored their social utility, highlighting their potential in reviving cultural heritage, developing a sense of community and of place, as well as social capital (Bakas *et al.*, 2019; Qu and Cheer, 2020; Ma and Lew, 2012). Others investigated their role in the choice of tourist destination (Oh and Lee, 2012), or attendance motivations, so as to segment visitors (Li *et al.*, 2009; López-Guzmán and Santa-Cruz, 2016). Some scholars have also attempted to investigate the relations between motivation, satisfaction and behavioural intentions of visitors (Akhoondnejad, 2016; Anil, 2012; Hsu *et al.*, 2021; Lee and Hsu, 2013).

As has been observed (Li *et al.*, 2009), current studies identify different attendee motivations with regard to different types of festivals. For this reason, we specifically aim to identify the motivations of visitors attending home-grown festivals, in order to compare them with those of participants at other types of festivals. A limited number of studies on home-grown festivals have considered the relationship between motivation and/or festival satisfaction and festival loyalty. Even less attention has been paid to the relationship between festival satisfaction and destination loyalty (Sung *et al.*, 2016; Lee *et al.*, 2017). In order to fill this gap, our research investigates, in the context of the home-grown festival, the relation between attendee motivations, festival satisfaction and loyalty, considering the latter both with regard to participation at another edition of the festival (festival loyalty), and to the willingness to return to the destination where the festival is performed, regardless of the event (destination loyalty).

Therefore, this research brings together studies addressing the motivations that encourage individuals to attend festivals (Lee *et al.*, 2004; Lee and Hsu, 2013; Maeng *et al.*, 2016) and those investigating the relationship between motivations, satisfaction, and the dynamics that stimulate individuals to return (Akhoondnejad, 2016; Lee and Beeler, 2009; Hsu *et al.*, 2021; Lee and Hsu, 2013; Savinovic *et al.*, 2012; Tsaour *et al.*, 2019; Vassiliadis *et al.*, 2021; Yoon *et al.*, 2010).

In particular, our study aims to disentangle first the relation between attendees' motivation and festival satisfaction; then, it investigates the relation between motivation and festival loyalty. Finally, the research explores the relation between satisfaction and both festival loyalty and destination loyalty.

The study provides several theoretical contributions and managerial implications, which can positively influence attendee satisfaction and loyalty. Specifically, it provides several insights for both home-grown festival organizers and destination managers.

2. Theoretical background

Home-grown festivals can play a significant role for the local economy of host towns, attracting visitors and tourists, who otherwise would not choose to visit a certain place (Oh and Lee, 2012; Vesce and Botti, 2019). Such festivals also provide socio-cultural benefits, nurturing a sense of community, social cohesion, local cultural identity, solidarity and well-being (Ma and Lew, 2012; Mair, Duffy, 2021; Patwardhan *et al.*, 2020; Qu and Cher, 2020; Woosnam *et al.*, 2018). They celebrate and reinforce local cultural identity, contributing to enhance the image of a destination (Hernández-Mogollón *et al.*, 2018; Patwardhan *et al.*, 2020). These festivals can offer visitors extraordinary immersive and co-creative experiences in the life and culture of the place (Alexiou, 2019; Tung and Ritchie, 2011), thus stimulating an emotional connection with the destination (Patwardhan *et al.*, 2020). Regarding specifically local heritage festivals, Ma and Lew (2012) emphasize that they are shaped by local identity, uniqueness and authenticity, being rooted in specific historical and geographical contexts.

Consistently, Johansen and Mehmetoglu (2011) stressed the relevance of the "habitat", i.e. the physical landscape of the festival, as a factor in the perceived satisfaction of participants attending an indigenous Norwegian festival of the Sàmi.

Numerous studies have investigated motivations encouraging people to participate in festivals (Lee *et al.*, 2004; Li *et al.*, 2009; Mohr *et al.*, 1993; Mair and Weber, 2019; Moretti *et al.*, 2017; Savinovic *et al.*, 2012; Yoon *et al.*, 2010). Such motivations were mainly traced back to attendee needs and purposes, such as the willingness to explore new places and learn about new cultures, escape from the daily routine, and meeting people (Alexiou, 2019; Mohr *et al.*, 1993). Ralston and Crompton (1988) in their seminal article identified a variety of motivations for taking part in events. Later, Crompton and McKay (1997) focused on motivations such as novelty, socialization and cultural exploration. Subsequent research further explored this topic, highlighting attendee motivations related, for instance, to the festival itself, the desire to be together with the family, and the desire to get away from it all (Maeng *et al.*, 2016). Although a number of recurring motivations have been identified with regard to various types of festivals, some studies proposed event-specific motivations associated with different types of festivals (Báez-Montenegro and Devesa-Fernández, 2017). Moreover Li *et al.* (2009) noted that, although motivations of festival attendees are similar, participants at local festivals are mainly motivated by internal rather than external factors.

As underlined by Crompton and McKay (1997), the relevance of motivations is not limited to the first phase of the experience; in fact, perceptions and motivations also affect post-consumption assessment (satisfaction) and product loyalty. Therefore, motivations are important as they can generate attendee satisfaction (Almeida *et al.*, 2019; López-Guzmán and Santa-Cruz, 2016; Yoon *et al.*, 2010), stimulate the intention to return (Savinovic *et al.*, 2012; Shen, 2014; Son and Lee, 2011; Tanford and Jung, 2017), and differ depending on the type of festival. For this reason, we first investigated motivations related to festival attendance.

As regards the satisfaction of festival attendees, various antecedents related to festival attributes, such as location, accessibility, program, amenities, authenticity, entertainment and experience quality, have been identified by previous studies (Akhoondnejad, 2016; Gannon *et al.*, 2019; Johansen and Mehmetoglu, 2011; Ma and Lew, 2012; Wan and Chan, 2013; Wong *et al.*, 2016). In this context, some scholars explored the relationship between motivations and satisfaction of festival attendees, showing that festival satisfaction is directly influenced by motivations (Albayrak and Caber, 2018; Formica and Uysal, 1998; Lee *et al.*, 2004; Tsai, 2021). Nevertheless, others found that attendee motivations only produce indirect effects on satisfaction (Kim *et al.*, 2008). As a result, a further investigation into this aspect is needed, and research should also seek to delve deeper into a hitherto less explored type of event, i.e. home-grown festivals.

Based on these premises, we formulate the following hypothesis:

H1: In the context of home-grown festivals, attendees' motivations significantly influence their degree of festival satisfaction.

The construct of loyalty has been defined as the commitment to re-buy or re-patronize a favored product or service in the future, despite situational influences that could encourage switching behavior (Oliver, 1999). Indeed, two different types of loyalty have been identified (Oliver, 1999) which highlight an objective and a subjective dimension respectively, namely behavioral loyalty, which involves the repetition of purchasing behavior, and attitudinal loyalty, which comes from a positive attitude (intention) toward repurchase.

Building long-term relationships with customers has become a crucial goal also in the field of events and festivals, where loyalty has been identified through criteria such as repeat intention, willingness to pay more, positive word-of-mouth recommendations, and intention to recommend (Báez-Montenegro and Devesa-Fernández, 2017; Lee and Hsu, 2013; Yoon *et al.*, 2010).

Many studies have focused on determinants of festival loyalty, including e.g., festival quality, involvement and satisfaction (Baker and Crompton, 2000; Choo *et al.*, 2022; Ho *et al.*, 2022; Yoon *et al.*, 2010). For instance, recently Choo *et al.* (2022) explored the “direct, indirect and moderating role of involvement in the satisfaction, quality and loyalty relationship among local food festival tourists” (p. 57), demonstrating that involvement influences loyalty relationship among local food festival tourists, both directly and indirectly, via satisfaction and quality. In addition, the role of intrinsic motivational factors to attend a festival and to return has been considered. In particular, Grappi and Montanari (2011) found that “hedonism and social identification are key-facilitators between environmental cues and attendee repatronizing intention” (p. 1128). In light of current studies investigating the relationship between motivation and festival loyalty, we explore this relation with specific regard to home-grown festivals, to understand if intrinsic or extrinsic motivation prevail in influencing festival loyalty. Therefore, we formulate the following hypothesis:

H2: In the context of home-grown festivals, attendees' motivations significantly influence festival loyalty.

Moreover, some scholars highlighted that attendee overall satisfaction can be considered important, driving the intention to return to the festival (Ho *et al.*, 2022; Hsu *et al.*, 2021; Lee and Hsu, 2013; Son and Lee, 2011; Wan and Chan, 2013). With specific regard to small local festivals, Akhoondnejad (2016) observed that perceived quality influences satisfaction, which in turn positively affects festival loyalty; while Lee and Hsu (2013) showed that motivations directly affect satisfaction and indirectly affect loyalty to festivals. In this vein, Anil (2012) identified a number of festival features, i.e. food, festival area, and convenience, as effective antecedents of visitors' satisfaction and intention to return to attend festivals.

However, the relationship between festival satisfaction and destination loyalty is still unclear and not completely explained. Indeed, only a few sparse measurement attempts have been conducted in this regard, mainly with reference to other types of events, e.g. international sport festivals,

food and wine festivals (Jeong and Kim, 2020; Lee *et al.*, 2017; Sung *et al.*, 2016). Thus, we believe that a further research effort is desirable, with specific reference to home-grown festivals. In this vein, for example, Patwardhan *et al.* (2020) demonstrated that place attachment as well as emotional solidarity experienced with local residents positively affect festival visitors' destination loyalty.

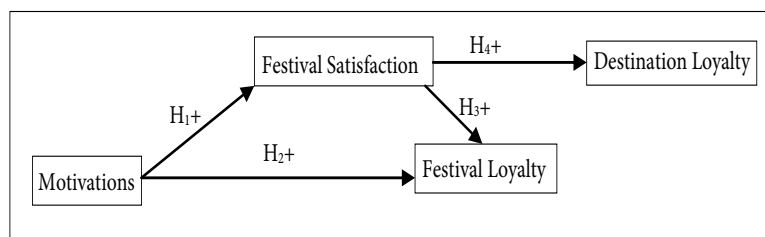
Based on extant literature, we specifically aim to understand if, in the context of home-grown festivals, festival satisfaction better predicts festival loyalty or destination loyalty. Therefore, we formulate the following hypotheses:

H3: In the context of home-grown festivals, attendees' festival satisfaction significantly affects festival loyalty.

H4: In the context of home-grown festivals, attendees' festival satisfaction significantly affects destination loyalty.

Figure 1 shows the conceptual model of the research.

Fig. 1: Conceptual model



Source: our elaboration

3. Methodology

3.1 The research context

The research context is the Maiorchino festival. It is performed annually in an ancient Sicilian mountain town named Novara di Sicilia.

The Maiorchino cheese is a typical local product, particularly appreciated for its quality deriving from the high-altitude pastures. The festival originates from the ancient tradition which dates back to the XVII century, according to which molds of Maiorchino cheese were thrown into the air to check their degree of maturation. It is based on a competition among teams of local players, which takes place in the month before the Carnival. The teams compete in a series of launches of whole cheeses, along the streets of the historic center of Novara di Sicilia, where the race course is marked out. The Maiorchino race, which is part of the local cultural heritage, is folkloric and spectacular both for the skills of the players in throwing the cheese after having rolled it up in a rope, and for the fact that the ancient cobbled streets sometimes create unexpected trajectories for the rolling cheeses.

The ludic community of the Launch of Maiorchino from Novara di Sicilia has participated for several years in the “Tocati International Festival of Street Games”, held annually in Verona (Italy), which aims to safeguard ancient and traditional games as an intangible cultural heritage, and has been under the patronage of UNESCO since 2016². (Castellani *et al.*, 2016)

Every year, about 2,000-2,500 people attend the Maiorchino festival, enjoying the joyful atmosphere of the race. The festival attracts mainly domestic flows of visitors. In fact, usually, more than 90% of participants come from the surrounding areas or from other Sicilian cities, while less than 10% come from other Italian regions or from foreign countries.

The festival is organized by a local no-profit association, named “Circolo Sportivo Olimpia - Il Maiorchino”, which in April 2022, as proposed by the Ancient Games Association (AGA) of Verona (Italy), applied to join the European Association of Traditional Games and Sports, whose purpose is the management, promotion and preservation of traditional games and sports.

Private sponsors support festival organizers with their economic contribution. The local tourism office provides support with regard to giving visitors assistance and information during the festival.

The local community is highly involved in the festival, taking part in the competition, cheering for the teams, and voluntarily offering support to the festival organizers. The residents' obvious attachment to their local cultural heritage is demonstrated by their enthusiastic participation as well as their desire to keep tradition alive through the festival, and to give tourists insight into the local cultural heritage.

3.2 Data collection and measures

An empirical investigation was carried out by administering a questionnaire to a sample of participants at the Maiorchino festival in 2019.

The survey aimed to identify the socio-demographic profiles of the participants; to explore the motivations behind their attendance and the factors influencing their degree of festival satisfaction; to evaluate their intention to return to the festival, as well as to the destination, regardless of the festival. Participants' motivations were measured through a scale containing 13 items, 10 of which were taken from previous studies on the topic of tourist motivation in attending festivals (Crompton and McKay, 1997; Lee *et al.*, 2004; Li *et al.*, 2009), while the others were adapted with regards to the specific characteristics of the festival under consideration (Maeng *et al.*, 2016). These items were measured on a 7-point Likert scale (1: not important; 7: very important).

² In March 2021, the Italian National Commission for UNESCO approved the candidacy of the Tocati Network, which includes the ludic community of the Launch of Maiorchino, in the Register of Good Practices for the Safeguarding of Intangible Cultural Heritage, with the official name of “Tocati, a shared programme for the safeguarding of traditional games and sports”. The Tocati project, which includes also Belgium, Cyprus, Croatia and France, intends to protect traditional games, rooted in the daily life of communities and fully falling within those social practices capable of becoming expressions of daily life, rituals and festive contexts common to large areas of Europe.

A single-item question was used to measure attendee overall festival satisfaction. It was measured by a 10-point scale, in which 1 corresponded to “very unsatisfied” and 10 corresponded to “very satisfied”. Intention to return to another edition of the festival and intention to return to the destination regardless of the festival, were measured with dummy variables (0=no and 1=yes)³.

Before administering the survey, we pre-tested the questionnaire on a group of 10 graduates, in order to fine-tune it. We paid particular attention to checking the clarity and understandability of the questions, as well as the appropriateness of the vocabulary used, in order to avoid misunderstandings when completing the questionnaire.

Non-resident adults were eligible for the survey, which was self-administered. A team of field assistants was available to provide respondents with clarifications on the questionnaire. A convenience sample of respondents was recruited using the street interception method (Graham *et al.*, 2014). The administration of the survey was done on each of the days the competition was held. The staff distributed the questionnaires in some areas of the circuit where visitors were more likely to stop for a while. In order to avoid selection bias in recruiting respondents, the fixed line method was applied (Voas *et al.*, 2006). The staff approached one potential respondent every three passers-by, showed the goals of the research and asked them to dedicate a few minutes to fill in the anonymous questionnaire.

Altogether we approached 403 people; 72 of them were not eligible, while 61 did not accept to take part in the survey, thus we collected 270 questionnaires. Among them, 227 were sufficiently filled in to be considered for the purpose of the research, and for subsequent elaboration.

3.3 Data analysis

In order to identify the underlying dimensions of attendee motivations associated with the festival, we applied factor analysis to the 13 items, using principal components analysis with varimax rotation. Pre-tests including the KMO test of sampling adequacy, Bartlett’s test of sphericity and Cronbach’s alpha coefficient to evaluate reliability were performed.

To test hypotheses, we ran a multiple linear regression to explain satisfaction with the festival, considering the motivational factors resulting from the factor analysis as independent variables. Subsequently, considering festival satisfaction and motivations as independent variables respectively, three logistic regressions were performed to explain intention to return to the festival and to the destination regardless of the festival.

³ The different format of some scales was used to try to reduce the risk of common method bias.

4. Results

4.1 Demographic profiles of respondents

The sample gathered included 45.4% women and 54.6% men. The respondents were between 18 and 80 years old, however 51.5% of them were between 45 and 64 years old. The 94.2% of the sample came from Sicily, while only 5.8% were from the rest of Italy or from abroad. The interviewees reached the festival destination with friends (56.4%), but also as a couple (25.5%), with family (13.6%) or alone (4.5%). Moreover, 68.6% of respondents were attending the festival for the first time, while 31.4% were participating at least for the second time. Furthermore, 70.9% of the sample would return home the same day, while 29.1% would stay overnight in the town of the festival or in the surrounding area (Table 1).

Tab. 1: Respondents' profile

| Variable | Category | Distribution (valid percentage) |
|---|---------------------|------------------------------------|
| Gender | Male | 54.6 |
| | Female | 45.4 |
| Age | 18-24 | 5.7 |
| | 25-34 | 15.5 |
| | 35-44 | 12.9 |
| | 45-54 | 24.2 |
| | 55-64 | 27.3 |
| | >64 | 14.4 |
| Education | High school or less | 49.1 |
| | Graduate | 42.6 |
| | Post-graduate | 8.3 |
| Place of origin | Surrounding areas | 50.2 |
| | Rest of Sicily | 44.0 |
| | Rest of Italy | 4.4 |
| | Abroad | 1.3 |
| Returning visitor | Yes | 31.4 |
| | No | 68.6 |
| Accompanied by | None | 4.5 |
| | Partner | 25.5 |
| | Family | 13.6 |
| | Friends | 56.4 |
| Overnight stay | Yes | 29.1 |
| | No | 70.9 |
| Overall Satisfaction | Mean | 8.3 |
| | S.d. | 1.41 |
| Intention to return to the Festival | Yes | 91.6 |
| | No | 8.4 |
| Intention to return to Novara regardless the Festival | Yes | 93.0 |
| | No | 7.0 |

Source: our elaboration

4.2 Attendee motivations

To explore the main motivations of the festival attendance, factor analysis was carried out applying the method of the main components (Varimax rotation) to the 13 motivational items. The Bartlett sphericity test, which was significant ($687.950 < .001$, $df = 78$), as well as the KMO

sample adequacy measure of .821 (> of .60), confirmed that the factorial analysis conducted was appropriate. All the variables but one revealed a commonality greater than 0.50, thus demonstrating a good overall significance of the analysis, which generated a structure of 4 factors, with 12 items⁴. Cronbach's Alpha reliability coefficient for each of the factors was sufficient (with a range between .53 to .76). Lastly, the total variance explained was 61.95% (Table 2).

Tab. 2: Results of factor analysis

| Motivation factors and items | Factor loadings | Eigenvalue | Variance explained | Reliability coefficient |
|--|-----------------|----------------------------------|--------------------|-------------------------|
| F1: Search for novelty | | 4.314 | 20.41% | .76 |
| I love learning about local traditions | .776 | | | |
| It is an opportunity to visit the destination where the festival takes place | .756 | | | |
| It is an opportunity to know new places and have fun | .715 | | | |
| I appreciate the local cuisine specialties | .689 | | | |
| F2: Experience of the local culture | | 1.635 | 16.98% | .72 |
| It makes me feel part of the local community | .836 | | | |
| It makes me feel an active part in maintaining traditions | .712 | | | |
| I like the atmosphere of the Festival | .545 | | | |
| F3: Festival attractiveness | | 1.095 | 14.85% | .64 |
| Participation is free | .759 | | | |
| I like Maiorchino cheese | .710 | | | |
| I am passionate about the race between the different teams | .644 | | | |
| F4: Socialization | | 1.010 | 9.71% | .52 |
| Friends recommended it to me | .810 | | | |
| It is an opportunity to meet friends | .663 | | | |
| Total variance explained | | | 61.95% | |
| KMO | .821 | | | |
| Bartlett's test of sphericity | | $\chi^2 = 687.950$ sig = .000 | | |

Source: Extraction method principal component. Rotation method varimax with Kaiser normalization

The first motivational factor, Search for novelty, explains 20.41% of the total variance. It identifies participants who like exploring new places and their traditions, and consider the festival as an occasion to visit a new place. The second factor, Experience of the local culture, explains 16.98% of the total variance. It refers to those festival attendees who love to feel part of the local community, contribute actively in keeping traditions alive, and experience the cheerful atmosphere of the festival. The third factor, Festival attractiveness, explains 14.85% of the total variance. It characterizes those

⁴ Regarding the low alpha value for F4 - "socialization", it depends on the small number of items (n=2). In this case Briggs and Cheek (1986) suggest considering the inter-item correlation, whose acceptable values are between 0.2 and 0.4. In this case the value is 0.355. So, the reliability of the scale is verified. Moreover, Perry and colleagues (2004) report that a value of alpha between 0.5 and 0.7 indicates an acceptable reliability.

participants interested in the festival itself, who are fond of the Maiorchino cheese, and are attracted by the festival program and the race. The fourth factor, Socialization, explains 9.71% of the total variance. It refers to those attendees who take part in the festival at the suggestion of friends or to take advantage of the festival to meet friends. On the basis of these 4 motivational factors identified, in the context of home-grown festivals, the above-mentioned hypotheses H1 and H2 can be articulated as follows:

- H1a: Search for novelty significantly influences attendees' festival satisfaction.
- H1b: Experience of the local culture significantly influences attendees' festival satisfaction.
- H1c: Festival attractiveness significantly influences attendees' festival satisfaction.
- H1d: Socialization significantly influences attendees' festival satisfaction.
- H2a: Search for novelty significantly influences festival loyalty.
- H2b: Experience of the local culture significantly influences festival loyalty.
- H2c: Festival attractiveness significantly influences festival loyalty.
- H2d: Socialization significantly influences festival loyalty.

4.3 Hypotheses testing

In order to test H1, a multiple linear regression model was tested, with overall festival satisfaction as the dependent variable and the four motivational factors, previously identified, as independent variables. The model (Table 3) was found to be significant and with an adjusted R² of .216. Motivations predicting the overall festival satisfaction score are in order: "Experience of the local culture" ($\beta = .345$ with $p < .001$), "Search for novelty" ($\beta = .275$ with $p < .001$), and "Festival attractiveness" ($B = .209$ with $p < .001$); while "Socialization" is not significant. These findings provide partial support for H1. Thus, hypotheses H1a, H1b and H1c are confirmed, while H1d is not.

Tab. 3: Multiple regression analysis assessing motivations as predictors of festival overall satisfaction (n =227)

| Independent variables: Festival attendee motivations | Overall satisfaction | | | |
|--|--------------------------------|----------|-------------------|-------|
| | Std. beta coeff. | t-value | Multicollinearity | |
| | | | Tolerance | VIF |
| Search for novelty | .275 | 4.524*** | .991 | 1.009 |
| Experience of the local culture | .345 | 5.589*** | .961 | 1.040 |
| Festival attractiveness | .209 | 3.389*** | .961 | 1.040 |
| Socialization | -.047 | -.769 | .983 | 1.017 |
| Overall model | Multiple R = .480 | | | |
| | R ² = .231 | | | |
| | Adjusted R ² = .216 | | | |
| | Model F (4, 222) = 15.736*** | | | |

** p < .05 *** p < .001

Source: our elaboration

To test H2, a logistic regression model was tested, in which the intention to return to the festival was considered as the dependent variable (binary variable), and the four motivational factors as independent variables. The model (Table 4) was found to be significant and with an R^2 of .154. The only motivations that predict the probability of returning to the festival are “Experience of the local culture” (Exp (β) = 2.004 with $p < .05$), corresponding to a probability of 66.7%, and “Socialization” (Exp (β) = 1.721 with $p < .05$) corresponding to a probability of 63.2%. These findings provide partial support for H2. In particular, hypotheses H2b and H2d are confirmed, while H2a and H2c are not.

Tab. 4: Logistic regression analysis assessing motivations as predictors of festival loyalty (n =227)

| Independent variables: <i>Festival attendee motivations</i> | Likelihood of returning to the festival (festival loyalty) | | | |
|---|--|---------------|--------------------------------|-------|
| | Exp (β) | Wald χ^2 | 95.0% C.I. for Exp (β) | |
| | | | Lower | Upper |
| Intercept | 14.036 | 76.699*** | | |
| Search for novelty | .944 | .030 | .489 | 1.819 |
| Experience of the local culture | 2.004 | 5.232** | 1.105 | 3.635 |
| Festival attractiveness | .698 | 1.506 | .393 | 1.240 |
| Socialization | 1.721 | 4.008** | 1.011 | 2.928 |
| Overall model | -2 Log Likelihood = 108.448 | | | |
| | R^2 (Nagelkerke) = .154 | | | |
| | χ^2 (df 4) = 14.939** | | | |
| | Hosmer-Lemeshow χ^2 (df 8) = 4.386 | | | |

** $p < .05$ *** $p < .001$

Source: our elaboration

To test H3, a logistic regression model was tested, in which the intention to return to the festival was considered as a dependent variable (binary variable), and the overall festival satisfaction as an independent variable (Table 5). The model was not significant, thus the H3 is not supported.

Tab. 5: Logistic regression analysis assessing overall satisfaction as predictor of festival loyalty (n =227)

| Independent variable: <i>Overall satisfaction</i> | Likelihood of returning to the festival (festival loyalty) | | | |
|---|--|---------------|--------------------------------|-------|
| | Exp (β) | Wald χ^2 | 95.0% C.I. for Exp (β) | |
| | | | Lower | Upper |
| Intercept | 2.833 | .534 | | |
| Overall Satisfaction | 1.182 | .917 | .839 | 1.665 |
| Overall model | -2 Log Likelihood = 116.470 | | | |
| | R^2 (Nagelkerke) = .010 | | | |
| | χ^2 (df 1) = .905 | | | |
| | Hosmer-Lemeshow χ^2 (df 3) = 8.527** | | | |

** $p < .05$ *** $p < .001$

Source: our elaboration

To test H4, a logistic regression model was tested, in which the intention to return to the destination regardless of the festival was considered a dependent variable (binary variable), and the overall festival satisfaction as an independent variable (Table 6). The model was found to be significant and with an R2 of .075. Total festival satisfaction predicts the probability of the visitor returning to the destination, regardless of the festival, with a value of Exp (β) = 1.625 with $p < .5$, corresponding to a probability of 61.9%. These findings provide support for H4.

Tab. 6: Logistic regression analysis assessing satisfaction as predictor of destination loyalty (n =227)

| Independent variables: Overall satisfaction | Likelihood of returning to the destination (Destination loyalty) | | | |
|---|--|---------------|--------------------------------|-------|
| | Exp (β) | Wald χ^2 | 95.0% C.I. for Exp (β) | |
| | | | Lower | Upper |
| Intercept | .324 | .530 | | |
| Overall Satisfaction | 1.625 | 5.679** | 1.090 | 2.423 |
| Overall model | -2 Log Likelihood = 91.225 | | | |
| | R ² (Nagelkerke) = .075 | | | |
| | χ^2 (df 1) = 5.902** | | | |
| | Hosmer-Lemeshow χ^2 (df 3) = 4.653 | | | |

** p < .05 *** p < .001

Source: our elaboration

5. Discussion

The aim of this research was to find the underlying dimensions of attendee motivations to go to home-grown festivals, and their relation to festival satisfaction and loyalty. Thus, by proposing and testing four main hypotheses, the study measured the impact of the identified motivational factors first on festival satisfaction, and then on festival loyalty. Eventually, the impact of festival satisfaction on festival loyalty and on destination loyalty was respectively tested.

The analysis allowed four main motivational factors to be identified: Experience of the local culture, Search for novelty, Festival attractiveness, and Socialization. The first result confirms that attendees' motivations are different for home-grown festivals with respect to other types of festivals (Li *et al.*, 2009). Specifically, home-grown festival attendees, contrary to what has been highlighted for large-scale festivals (Li *et al.*, 2009), are more motivated by intrinsic factors, such as Experience of the local culture and Search for novelty, rather than by extrinsic factors, such as Festival attractiveness.

A second result indicates that motivations affect, although differently, both festival satisfaction and festival loyalty. Specifically, both intrinsic (Experience of the local culture and Search for novelty) and extrinsic motivations (Festival attractiveness) have a direct impact on festival

satisfaction, while only intrinsic motivations (Experience of the local culture and Socialization) have an impact on festival loyalty. This confirms the evidence of previous studies underlying the relevance of intrinsic motivational factors as determinants of attendees' festival satisfaction (Grappi, Montanari, 2011; Lee *et al.*, 2017). This result is in line with Lee and Hsu (2013), although they found an indirect relation between motivations and festival loyalty. These results show a distinctive feature of home-grown festival attendance over time, which is not related to the specific content of the festival itself (which is, however, an important motivation to stimulate people to participate for the first time in the festival), but rather related to other aspects of the overall experience in the area where the festival is performed. In particular, the desire of attendees to explore local culture and traditions, by fully immersing themselves in the life of the place, as well as to interact with local people and other participants are the motivations that stimulate participation in the festival over time. In particular, the desire for socialization may also concern those participants, born locally but then emigrated, who take the opportunity of the festival to return to meet relatives and friends.

We believe that the relationship between attendee motivations (i.e. experience of local culture and socialization) and festival loyalty can be explained considering also some specific feature of its participants, such as their geographical origin. As evidenced by the composition of the sample of respondents, as many as 94.3% of the participants come from Sicily, while only 5.7% are from the rest of Italy or abroad. This suggests that the geographical proximity of such a large part of the sample may facilitate the decision to participate in subsequent editions of the festival, given the ease of reaching the destination where it is performed.

Our third result is that festival satisfaction is not important to build festival loyalty. This differs from previous research, which identified attendee satisfaction as a driver of festival loyalty (Akhoondnejad, 2016; Anil, 2012; Girish and Chen, 2017; Ho *et al.*, 2022; Hsu *et al.*, 2021; Lee and Hsu, 2013; Son and Lee, 2011; Sung *et al.*, 2016; Wan and Chan, 2013).

Finally, another very interesting result is that satisfaction with the festival relates to destination loyalty (Lee *et al.*, 2017; Sung *et al.*, 2016). This result builds on the findings of Jeong and Kim (2020) from their study of an international sport festival, in relation to the field of the home-grown festival, and confirms findings from Lee *et al.* (2017).

The latter two results, which specifically show that festival satisfaction relates to destination loyalty but not to festival loyalty, are the most relevant findings of our research, as they highlight a clear difference with findings of previous studies on the same topic. With reference to the above, it seems that in the context of home-grown festivals, ensuring attendees are satisfied is more important in order to attract visitors to the destination, rather than to attract visitors to other editions of the festival. A possible explanation is that people attending a home-grown festival, being motivated mainly by the desire to experience novelty and local culture, are interested in exploring new places to discover its traditions, habits, and people. In this regard, home-grown festivals can represent an opportunity to explore new places and their cultural heritage, thus increasing attendee

attachment to the host territory, and developing a sense of place, which favours an emotional and cultural connection between visitors and the host destination and community (Hassanli *et al.*, 2020; Ma and Lew, 2012; Tsaur *et al.*, 2019; Woosnam *et al.*, 2018) as well as the decision to return. This is coherent with Mair and Duffy (2021), who assessed that festivals are “a way to engage in embodied, experiential, affective and emotional activities and practices that facilitate a sense of belonging to the local” (p.176). In this vein, Deng and Tang (2020), highlighted the relevance of creating experiential value with festivals to promote destination image and develop destination loyalty. We believe that holding a home-grown festival may facilitate participants’ attachment to the destination as may the specific features of this type of festival, e.g. the active involvement of local community, as well as their attachment to local culture and traditions and their interest in reviving and communicating them to visitors. Moreover, the limited dimensions and the local setting of this type of event facilitate a closer interaction between visitors and the local community. Furthermore, the predominantly local catchment area of this type of festival can encourage the return to the territory for daily visits. Accordingly, as noted with reference to the Maiorchino festival, the massive presence of participants from neighboring areas is reflected in the fact that less than a third of the participants stay overnight in the festival area.

6. Conclusions

This study provides several theoretical contributions. First, it expands knowledge about home-grown festivals, confirming, also for this type of festival, the relation between motivations and satisfaction. Second, exploring the relation between festival satisfaction and loyalty, this study reveals that, contrary to previous research, in the context of home-grown festivals, satisfaction does not affect festival loyalty, but influences destination loyalty. This evidence leads us to understand that, unlike other types of events, home-grown festivals are an opportunity to make participants aware of the host destination and its tangible and intangible heritage, stimulating interest to return to the destination.

Our findings also offer practical insights for local marketing managers. Home-grown festivals can be effective marketing tools for small towns, providing benefits both for local people and for visitors. Indeed, when based on local cultural heritage and traditions, a home-grown festival can become an integral part of the local heritage, and can be considered an effective “cultural heritage service” (Alexiou, 2019, p.14) to increase awareness of local culture, for residents and tourists. The bottom-up approach and the commitment of residents in organizing and participating in the race, favor the recurrence of the festival over time. This allows both local culture to be passed on while attracting day-trippers and tourists, thus providing clear benefits for the local economy. In this regard, destination managers could contribute in supporting festival organizers, proving e.g. monetary contributions, communication activities as well as services to support festival performance (e.g. security, public order, hygiene). At

the same time, in line with Deng and Tang (2020), also festival managers should strive to create experiential value with the festival (i.e. service quality, aesthetics, playfulness), in order to increase attendees' satisfaction.

Moreover, since festival satisfaction has been found to influence destination loyalty, destination managers could leverage this finding and take care of a number of elements which can improve attendees' overall satisfaction with their experience in the destination, e.g. providing information on cultural heritage and developing opportunities for experiential tourism in the area. Since, as has been highlighted, home-grown festival attendees mainly come from neighboring areas and rarely stay overnight in the festival area, destination managers, who have a broad vision and are in charge of coordinating and managing the development of the local offer, face the challenge of increasing tourist flows in the area. In this regard, enhancing the local cultural and natural heritage, creating new opportunities for experiential tourism, effectively communicating the value of the territorial offer, and encouraging the development of tourist services, could be winning choices to enhance the tourist attractiveness of the area. We believe these policies would, on the one hand, trigger a driving force for territorial development, encouraging local entrepreneurs to offer tourist services (such as restaurants and accommodation services) to seize new business opportunities in tourism; on the other hand, they would stimulate the expansion of tourist flows, and specifically an increase in the average stay of tourists, as well as in return tourism.

Even though this manuscript offers some interesting contributions, it has some limitations. We recognize that we used a reduced number of items to analyze motivations, with respect to other research using more than 13 items (Lee *et al.*, 2004). Moreover, we are aware that exploring a single case study does not allow us to generalize and apply the results to other types of festivals. Therefore, it would be desirable that further research tested our hypotheses in other festival contexts. This would allow to understand if there are, or not, similarities between home-grown festivals and other types of small-scale festivals, with reference to the relations between attendee motivations, satisfaction and loyalty. In particular, future studies are encouraged to further investigate festival attendee behaviour, exploring more deeply the relation between festival satisfaction and destination loyalty, or the mediating or moderating role of festival satisfaction in the relation between motivations and festival loyalty.

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Exploring the relationship between attendees' motivation, satisfaction and loyalty in the context of a home-grown festival

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sinergie
italian journal of management

ISSN print 0393-5108
ISSN online 2785-549X
DOI 10.7433/s122.2023.08
pp. 171-191



Italian Society of
MANAGEMENT

Human resource management shaped in a platform: a literature review¹

Received
6th September 2022

Revised
14th February 2023

Accepted
6th December 2023

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Abstract

Frame of the research: The research investigates the key issues of electronic human resource management platforms from a business application perspective.

Purpose of the paper: The aim of this systematic literature review (SLR) is to shed new light on the key issues found in literature on electronic human resource management (e-HRM) platforms and to point out the main perspectives adopted in their business application. Ultimately, the goal is to provide insights for future research and highlight new managerial implications.

Methodology: In a SLR the number of papers on e-HRM platforms in the literature, the nature of the studies conducted, and the many definitions of key concepts have been investigated. Through a Multidimensional Scaling (MDS) analysis, the depth of the key issues is then analyzed, and their perspectives studied.

Findings: A definition of these platforms is given along with an explanation of their functionality, attributes and key issues. It is noted which journals write most about the topic, the provenance of the authors and how the topic is growing. What emerges from the MDS is that there are two perspectives to the analysis.

Research limits: The research may have limitations as the keywords used on the search platforms include certain papers, whilst excluding others that could be considered important by other researchers. The MDS is highly subjective.

Practical implications: It could be interesting to explore the critical and success factors of information technology and innovation.

Originality of the paper: Managers can use the MDS analysis and topics correlated to the thematic area to better understand these platforms. This study can help managers solve practical issues confronting companies.

Key words: electronic human resource management; e-hrm; knowledge sharing platform; multidimensional scaling analysis; E-HRM issues; literature review.

¹ Aknowledgements:

I would like to express my heartfelt gratitude to my supervisor, Professor Gennaro Iasevoli, for his unwavering support and guidance throughout the research process. His expertise, insights, and encouragement were invaluable in helping me to complete this work.

I also want to thank in particular Professor Laura Michelini from LUMSA University for her valuable contributions to my research. Without her precious help, guidance, availability and support, I would not have been able to complete this research.

1. Introduction

We are living in a world that is becoming more competitive every day. For this reason, a successful organization must be able to share knowledge successfully and efficiently (Widen-Wulff and Suomi, 2007). It should be able potentially to integrate different organizational business value chains. This is why it is crucial that Information Technology (IT) is located within business processes, given its many applications in every aspect of our lives. Technology has transformed our lives; from the invention of the telegraph to the invention of the smartphone, it has changed the way we live and the way we do our jobs. This applies also to human resources management (HRM). For this reason, HRM must become digital (Halid, *et al.*, 2020). IT has transformed the way organizations recruit, select, motivate, assess and retain employees. According to some research, the leap from heterogeneous sources and systems to centralized information management on cloud-based human resource (HR) platforms brings organizational and business benefits. Managers can keep an eye on their employees' history, performance and potentiality (Forrester Consulting, 2019). For Forbes Business Council (2022), the responsibilities of the HR department have to be managed more effectively with the help of advanced digital solutions.

The issue is very topical as technology makes advances; it is only right that even those companies without an internal HR department, such as many Small and Medium Enterprises (SMEs), should be able to take advantage of these services. Some researchers claim that the size of an organization is insignificant (Hussain *et al.*, 2007), while others see it as a fundamental factor (Strohmeier and Kabst, 2009).

Technology is widely used to gather, recover, store and propagate data for commercial purposes. Platforms are shared by complementary goods that often interact with the main technology foundation to include some functionalities (Tiwana *et al.*, 2010). Platforms make HRM easier. The most widespread technology for HRM is Electronic Human Resource Management (e-HRM) that "can be concretized as the (planning, provision, implementation, operation and) application of IT for both supporting and networking at least two (individual and/or collective) actors in their shared performing of HR tasks" (Strohmeier, 2012).

E-HRM, through the Internet, allows managers and employees to have access to HR information and services. Consequently, e-HRM systems facilitate the implementation of strategies (De Alwis *et al.*, 2022).

Nowadays, the ability of companies to manage e-HRM platforms to access HR information and services and to implement business strategies, represents a competitive asset. However, the potential opportunities offered by these types of platforms remain still unexplored (Bissola and Imperatori, 2013). The literature hitherto on e-HRM has focused on value creation process (Hussain *et al.*, 2007; Bissola and Imperatori, 2013); some authors have highlighted the importance of cost reduction (Strohmeier, 2007; Bondarouk *et al.*, 2009), while others have emphasized the importance of assessment and effectivity (Ruel *et al.*, 2007) and the impacts of e-HRM adoption (Strohmeier and Kabst, 2009; Bissola and Imperatori, 2013).

So far, only a few authors have studied the opportunities offered by e-HRM. (Strohmeier, 2007; Sanayei and Mirzaei, 2012). Authors particularly address the competitive advantage that e-HRM tools could bring to organizations, while making managerial implications secondary.

In the past few years, three main literature reviews have been published on e-HRM platforms in general. Strohmeier and Kabst (2009) analyzed a first cross-national exploration of factors that influence the organizational adoption of e-HRM in Europe. More recently, Bondarouk *et al.* (2017) have identified the key factors for adopting e-HRM in organizations and have presented an overview of e-HRM impact. Furthermore, Poisat and Mey (2017) have provided a state-of-the-art review of e-HRM and explored studies into the relationship between e-HRM and organizational productivity.

Although e-HRM tools have been highlighted, specific issues and related business applications have not yet emerged, and managerial implications remain scant.

Against this scenario, the aim of this systematic literature review (SLR) is to shed new light on the key issues found in literature on e-HRM platforms and point out the main perspectives (and areas) adopted in their business application. Ultimately, the goal is to provide insights for future research and highlight new managerial implications.

The paper is structured as follows. A study of definitions and the focus areas of this research is found in section 2. The methodology used for the meta-analytical SLR is explained in section 3. This is followed in section 4 where the research question and the discussions of the results appear. Section 5 has a concluding discussion of the findings with future developments and managerial implications the research might reveal.

2. Definitions and focus areas

Before the 1990s, few authors conducted research into e-HRM, and therefore IT in HRM (Yang and Babapour, 2022). IT was used mainly to mechanize personal processes using outdated mainframe technology (DeSanctis, 1986). In those years, the term e-HRM was coined to refer to conducting HRM activities with the use of the Internet (Lengnick-Hall and Moritz, 2003). The very first platforms were designed in those years and adjusted to evolving technology.

Table 1 lists some e-HRM definitions found in the existing literature that prove useful in understanding the phenomenon. Ruel *et al.*'s (2007) definition focuses on the strategic aspect and on web-based technology channels. In the same year, Strohmeier (2007) introduces a networking concept previously not possible without the Internet, which underlines the existence of at least two partners. Al Shobaki *et al.*'s (2017) definition relates to the integration between HR and IT. Finally, the definition by Shamout *et al.* (2022) describes the benefits that these platforms bring to an organization. These definitions were chosen as they best represent these platforms and their evolution; they track interest in the topic back to the early 2000s and illustrate the development and evolution of e-HRM platforms over subsequent years.

Tab. 1: Definitions of e-HRM

| Authors | Year | Definition |
|--------------------------|------|---|
| Ruel <i>et al.</i> | 2007 | “We define e-HRM as a way of implementing HRM strategies, policies and practices in organizations through a conscious and directed support of, and/or with the full use of, web-technology-based channels”. |
| Strohmeier | 2007 | “The planning, implementation and application of IT for both networking and supporting at least two individual or collective actors in their shared performing of HR activities”. |
| Al Shobaki <i>et al.</i> | 2017 | “The researcher defines the E-HRM as the process of integration between HRM and IT, using web- based applications in HRM”. |
| De Alwis <i>et al.</i> | 2022 | “E-HRM is the use of IT in HR practices to make it easier for employees and employers to communicate with one another and for organizations to improve their HR skills”. |

Source: author’s elaboration

All the definitions describe the importance of technology (Ruel *et al.*, 2007; Strohmeier, 2007; Al Shobaki *et al.*, 2017; De Alwis *et al.*, 2022). Ruel *et al.* (2007) explore the concept of strategy; organizational performance is mentioned by De Alwis *et al.* (2022); since recruitment and assessment are among the most important HR activities, their role is implicit in all the definitions (Ruel *et al.*, 2007; Strohmeier 2007; Al Shobaki *et al.*, 2017; De Alwis *et al.*, 2022). In the literature hitherto, scholars have drawn attention to the fact that these platforms need to be more strategic to have a longer-term perspective (Strohmeier and Kabst, 2009; Bissola and Imperatori, 2013; Bondarouk *et al.*, 2017). Scholars need to study current applications in order to have a more lasting perspective in future.

The earliest literature review of e-HRM was carried out by Gueutal *et al.* (2009). The phenomenon has developed to the present day and, according to the Scopus platform, the most cited literature analysis is by Bondarouk *et al.* (2017). Building on this analysis, the paper’s intention is to expand the topic by investigating platform variables and conducting an MDS analysis.

Organizations can improve employee communication and satisfaction, and lower administration costs, through e-HRM. The most important platform, according to Forbes (2022), is Monday.com, a cloud-based e-HRM platform that allows organizations to allow for management variables and applications. Monday.com enables better visibility into employees’ daily performance to ensure their success from the start.

An organization has different needs regarding e-HRM tools, preferring to implement different e-HRM key issues according to its vision. On this basis, through the literature analysis it has been possible to find five existing variables (figure 1).

Fig. 1: E-HRM variables



Source: author's elaboration

These variables found in the literature (Ruel *et al.*, 2007; Noe *et al.*, 2011; Sareen and Subramanian, 2012) were analyzed to understand the issues of interest to HRM and therefore to e-HRM platforms.

To confirm the variables, an analysis was carried out on 45 e-HRM platforms worldwide, in which all areas of interest on e-HRM platforms were studied and the five key issues found in the literature confirmed. These common issues are important for an in-depth understanding of the characteristics of e-HRM platforms. However, not all platforms have all five of these issues.

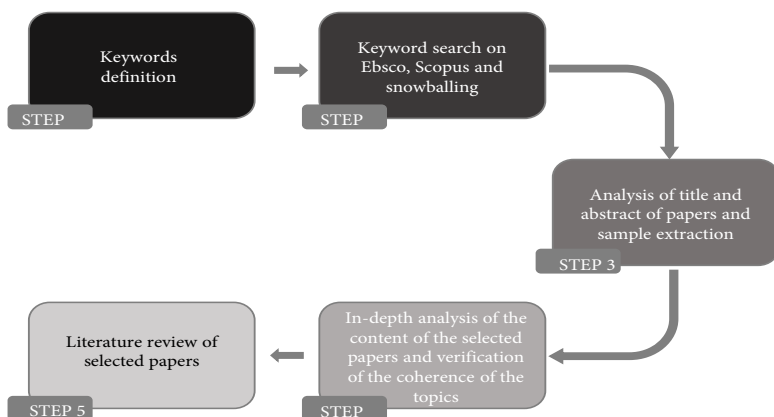
3. Methodology

To better interpret the phenomenon, a Meta analytical SLR (Paul *et al.*, 2020) was conducted, using a PRISMA article selection (systematic database search and cross-reference snowballing is illustrated in figure 2), following the recommendations of Geissdoerfer *et al.* (2018) and Grieco and Iasevoli (2017). The steps (McInnes *et al.*, 2018) include the “Identification,” “screening,” and “included”.

The objective of this SLR is to shed new light on the key issues found in e-HRM platform literature and to point out the main perspectives adopted in their business application. The ultimate aim is to provide insights for future research and highlight new managerial implications.

The keywords selected for the analysis were chosen after surveying the relevant papers. A decision was made to use the keywords found in Ottolenghi (2021), given the author had first studied the papers' keywords and then run a bibliometric analysis on them on VOSviewer software. To further confirm these choices, articles were read carefully to understand what keywords were used. Additionally, e-HRM platforms operating worldwide were analyzed to ascertain the terms used to define themselves.

Fig. 2: Sample approach



Source: author's elaboration

In the identification step, the search criteria (table 2) were developed including the terms “e-HRM”, “Knowledge sharing platform”, “e-lancing”, “gig-work”, and “electronic human resource management”. “Article title, or Abstract, or Keywords” were used to search for articles in English on the EBSCO and Elsevier Scopus databases.

Since identified articles must be screened in the PRISMA 2020 flow diagram, the eligibility of each article was ascertained and articles not matching the inclusion criteria were deleted. This screening was done both by automation and manually.

Tab. 2: Literature search strings

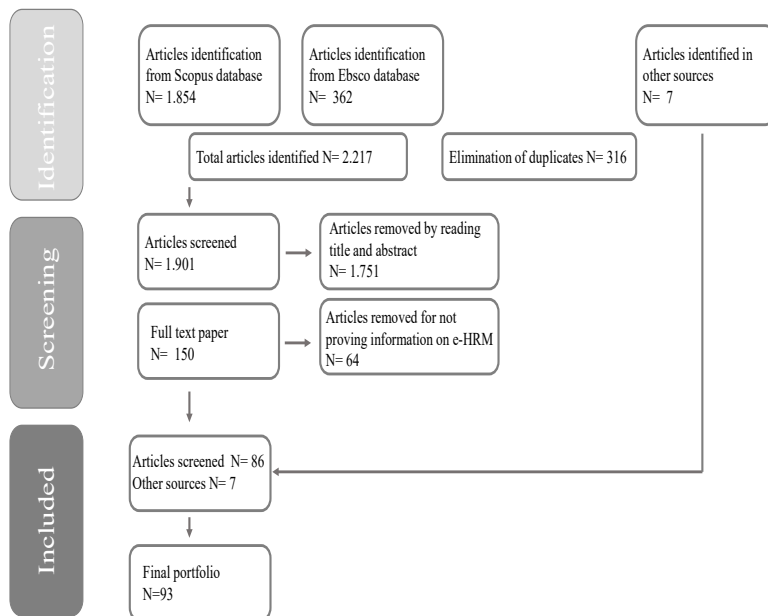
| Search string | Search field | Number of non-exclusive results | |
|--------------------------------------|---|---------------------------------|-------|
| | | Scopus | EBSCO |
| e-HRM | Topic/Article title, Abstract, Keywords | 279 | 87 |
| Knowledge sharing platform | “ | 1,497 | 47 |
| e-lancing | “ | 6 | 9 |
| Gig-work | “ | 68 | 208 |
| Electronic human resource management | “ | 4 | 12 |
| Total | | 2,217 | |

Source: author's elaboration

In these first steps, the analysis carried out was extensive; it included different disciplinary areas such as human sciences, engineering, medicine, etc., and differently ranked journals. Subsequently, a funnel approach was used to gradually narrow the study's boundaries and where the abstracts of identified publications were scanned to define an initial sample of relevant literature, as in figure 3. The timeframe considered goes from 2004 (the year Ruël, *et al.* (2004) published their paper, since when many

international authors became interested in the phenomenon) to March 2022. After finding and selecting the texts, papers from a snowballing search were added. The initial sample was composed of 2,217 papers (1,854 from Scopus and 362 from EBSCO); while reading other relevant articles, the author found a further 7 papers of interest and added these through snowballing research. These papers found through snowballing research (while searching for other relevant articles in other software) have the potential to enhance the analysis. Of these 2,224 articles, 150 were selected after a first read of the abstract (figure 3). As is noted from the large number of unselected papers, there were many that fell outside the focus of the research, even though some links with keywords were ascertained in the research. For example, many articles focused on topics not close to HR such as medicine or school education; the reason being that these platforms are very useful in a hospital and educational setting. This phase was useful in defining and validating different approaches adopted for classifying papers and the subsequent MDS analysis. The last reading phase (full texts) led to the exclusion of other papers not aligned with this paper's objective. This step led to a selection of 93 articles in total, forming the basis of the analysis.

Fig. 3: Results of applying PRISMA



Source: author's elaboration

The next step involved an analysis of the 93 articles. To provide a structured approach to the review, classic variables were selected based on the existing literature (Hossain, 2016; Pisoni *et al.*, 2018), including year of publication, journal, citation and methodologies used. Starting from

the study of the relevant literature and an inductive category development approach, in which the researcher immerses herself in the data to allow new insights to emerge (Kondracki *et al.*, 2002), the decision was made to use the five variables given in figure 1 and conduct an MDS analysis. The variables are: Technology, Recruiting, Assessment, Strategy and Organizational Performance. The MDS analysis was carried out to identify the depth or otherwise the topics and the correlation between them. To do so, it has been decided to analyze each paper according to certain approaches to give a clear picture of the topic.

Kruskal (1964) explains what an MDS analysis is. He believes that this technique can offer a visual, clear and simple representation of the strings presented as points on a map. This method allows us to understand similarities and dissimilarities between elements in the configuration.

Starting from the 93 articles studied in the SLR, the author analyzed them individually based on the 5 variables mentioned above (as described in section 2, figure 1). For each paper, the basic question was “how deeply connected is the following issue to e-HRM and how does it deal with it?” for each thematic strand of the analysis. Scores were given from 1 to 6, as in table 3.

An initial meeting was held with two experts in the field (including one professor and a manager) to share the method and to establish the correct evaluation. Scores were given firstly by the author and subsequently checked by the experts according to the coding scheme. In the very few cases of divergence, a more in-depth analysis was carried out.

Tab. 3: Criteria for MDS

| MDS | | Criterion | | | | | |
|---------|----------------------------|-------------|---------------|-------------------------|-------------------|---------------------------------------|-------------------------|
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| Factors | Technology | Not covered | Brief mention | Brief topic description | Wider description | Extensive multi-paragraph description | Many dedicated sections |
| | Recruiting | | | | | | |
| | Assessment | | | | | | |
| | Strategy | | | | | | |
| | Organizational Performance | | | | | | |

Source: author's elaboration

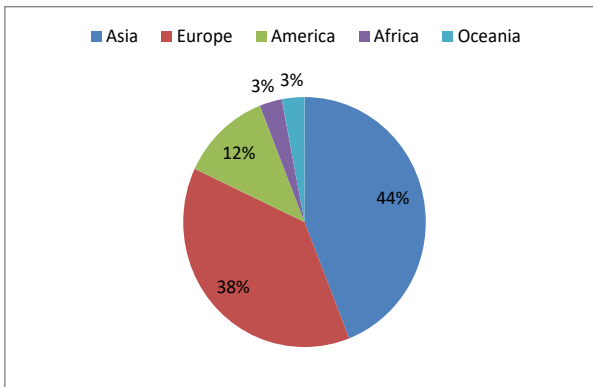
4. Results

In order to shed new light on the key issues underlying the literature on management e-HRM platforms and to point out the main perspectives adopted in their business application, the author studied the phenomenon's evolution over the years and the concepts underpinning the phenomenon. This was explored by studying the main topics in the literature, the main methodologies deployed, the journals where the topic features, the countries of provenance of the authors where the topic is more predominant, the principal industry of reference, the depth of certain variables (through the MDS analysis) and relations to each other.

As far as the quantitative results of the literature analysis are concerned, the 93 papers analyzed (mentioned in the Appendix) come from 57 journals. Specifically, 5 articles come from the Journal of Knowledge Management and the other 5 from the Human Resource Management Review. The others were published with an average of 1 to 3 journals per article.

The 93 papers considered in this analysis included 266 authors, with an average of 2.86 authors per paper. The authors were from 33 different countries. Nearly half of this sample (figure 4) comes from Asia (44%); other significant percentages are from Europe (38%) and America (12%), followed by Africa (3%) and Oceania (3%).

Fig. 4: Continent of origin of authors



Source: author's elaboration

There has been a modest increase in publications per year in this specific topic (figure 5). There were only 6 papers published in the chosen timeframe 2004–2007, 11 in the period 2008–2010, 15 papers in the years 2011–2013. In the years 2014–2017, 20 articles were published; in the timeframe 2018–2022, 41 relevant papers were written.

Fig. 5: Number of articles per year



Source: author's elaboration

It is possible to note an almost equal division of methodologies used (figure 6). Empirical studies are narrowly in the majority (54%), while theoretical studies are slightly less than half (46%). The methodologies adopted in the empirical studies, represented in figure 7, were mostly quantitative (30%), followed by a good number of framework (19%) and theoretical studies (19%). A significant proportion of the studies involved qualitative analysis (11%) and literature reviews (9%). There was also 13% composed of other typologies of studies, such as experimental studies, focus groups, case studies, cluster analysis, etc.

Fig. 6: Adopted methodologies

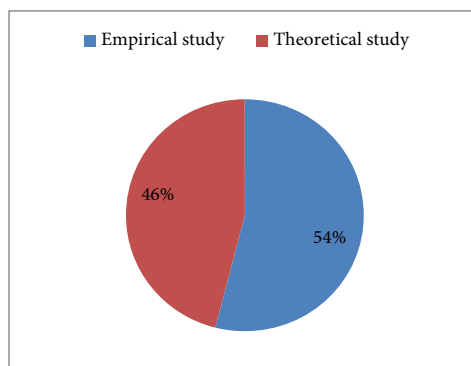
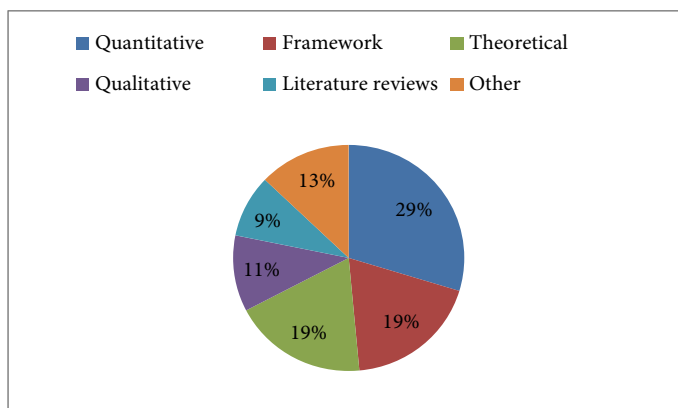


Fig. 7: Adopted studies



Source: author's elaboration

In table 4, the most cited article (based on Google Scholar) is by Strohmeier (2007). This paper is widely used in the theoretical section to analyze e-HRM platforms. This analysis brings out an introductory work from different disciplines and relates to different analyses and different subjects of e-HRM. The second was published by Ruël *et al.* in 2004. Its aim is to demystify e-HRM by studying its goals and different typologies. The third most cited is by Vallas and Schor (2020), where the authors

identify four major themes in the literature and the underlying metaphors associated with each; the fourth, written by Stanford (2017), illustrates the major features of the platforms, while the fifth by Shang *et al.* (2011) is about Web 2.0 services and the different levels of knowledge exploitation. The top 5 most cited articles are focused on: gig-work (2 articles), e-HRM (2 articles) and knowledge sharing platforms (1 article).

Tab. 4: Top 5 most cited articles

| Author(s) | Title | Year of publication | Country of publication | Number of citations |
|---------------------|--|---------------------|------------------------|---------------------|
| Strohmeier | Research in e-HRM: Review and implications | 2007 | Germany | 884 |
| Ruël <i>et al.</i> | E-HRM: Innovation or irritation. An explorative empirical study in five large companies on web-based HRM | 2004 | Netherlands | 763 |
| Vallas & Schor | What do platforms do? Understanding the gig economy | 2020 | USA | 514 |
| Stanford | The resurgence of gig work: Historical and theoretical perspectives | 2017 | Australia | 318 |
| Shang <i>et al.</i> | Understanding Web 2.0 service models: A knowledge-creating perspective | 2011 | China | 234 |

Source: author's elaboration

After studying these 93 papers and some of the best-known definitions of these platforms, a new definition has been provided, based on the study of the papers and the analysis of e-HRM platforms. In order to include the new potential of technologies and the features today's platforms have, it is appropriate to update the definition:

“E-HRM platforms aim to create value for organizations and employees, through networking where different stakeholders interact with each other even if they have different roles. The goal is to create value at all stages of HR value chain”.

Turning now to the MDS analysis, the results are shown in table 5.

Tab. 5: MDS scores

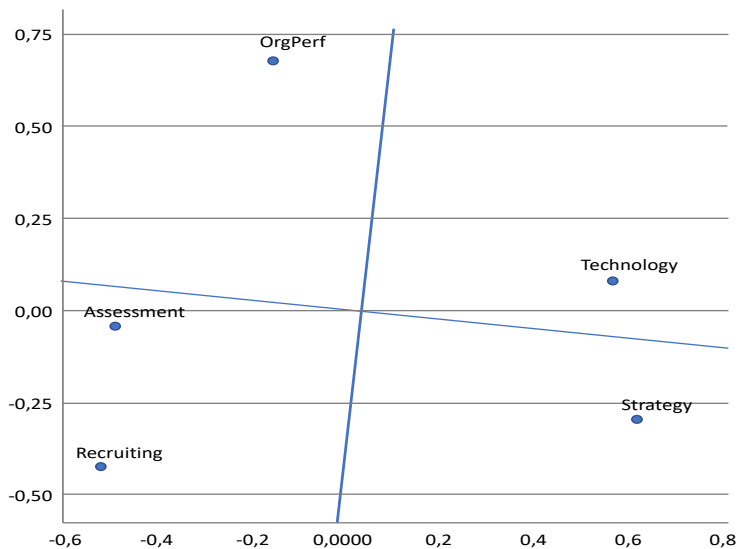
| | Average score | Variance |
|----------------------------|---------------|----------|
| Technology | 3.7 | 2.160 |
| Recruiting | 2.1 | 2.359 |
| Assessment | 2.1 | 2.101 |
| Strategy | 3.6 | 2.681 |
| Organizational Performance | 2.8 | 2.682 |

Source: author's elaboration

As to the analysis of variance, it is possible to note that variance is similar to the scores. There are situations where, for example, Assessment, Recruiting, and Organizational Performance have only a few points, and others where there are many points of difference, as is the case with Technology and Strategy. After identifying the techniques, the MDS analysis was designed. The final data was therefore 465, given 93 papers and 5 dimensions. Through the software SPSS version 28, an MDS Proxcal was made (figure 8).

An examination of S-stress (0.030) and Stress-1 values (0.108) validate that a two-dimensional data solution is trustworthy and that the map can identify latent semantic dimensions. The literature shows that there are five key issues and from this, two perspectives can be highlighted.

Fig. 8: MDS



Source: author's elaboration

Figure 8 indicates that the five identified issues are at the end of the two axes representing the two perspectives that characterize them. The first perspective is the tactical-strategic point of view, depending on whether the focus is on tactical actions (short-term activities) or strategic (long-term). The latter includes articles where e-HRM are analyzed with a tactical or strategic perspective, i.e., with a short or long-term perspective.

The second analytical perspective is performance-activity. The latter includes those articles where e-HRM platforms include performance or activities variables; these studies define the term in a more general way that includes the different typologies of e-HRM. What emerges is an inversely proportional relationship between performance and activity issues: the more a study focuses on a specific e-HRM issue typology, the less it aims to provide a strategic view; rather, it is mostly concerned with its tactical effect.

In the following is the analysis of the four areas these perspectives create.

Area 1: In the tactical-activity area there is a group of papers that tend to deal with assessment and recruitment. They generally have a short-term perspective, hence tactical, and a fundamentally activity-based perspective. Rushit and Jegan (2019) are to be mentioned with their descriptive study as they analyze the implementation of e-HRM and its impact on organizational commitment.

Area 2: The tactical-performance area encompasses studies related to the organizational performance perspective with a tactical point of view, hence short-term perspective. An example is Al Haziazi's work (2019) which examines the link between e-HRM activities and organizational performance and develops a conceptual framework relying on transactional, relational and transformational activities. As shown in the example, all papers in this area look only at short-term performance (Al Haziazi, 2019; Poba-Nzaou *et al.*, 2020; Khawaldeh, 2020).

Area 3: The performance-strategic area includes those works linked to technology not analyzed from an organizational point of view, but from a strategic one. To name an example, Bellesia *et al.* (2019) in their work investigate digital platforms, intended both as providers of technological features and online environments.

Area 4: The group of papers in the activity-strategic area, have a more strategic view of key issues, therefore, actions that can be done (working-time monitoring, rewards, etc.) have a more strategic aspect. An example to mention is the paper by Kuhn and Galloway (2019), a guest editorial published in the *Journal of Managerial Psychology* where the authors seek to expand perspectives on gig work and gig workers. The authors feature activities with a strategic perspective, in line with many other authors in this area (Hooi, 2006; Subhashree and Vasantha, 2020).

From this analysis it is noted that there tends to be a perspective of studies with a more tactical and short-term perspective while, when looking at the important functionalities like assessment and recruitment, they are not read with a strategic perspective, which should be important for a longer-term view of e-HRM platforms.

It has been noted that papers that have a more technology-based focus, also have a longer time perspective by having a strategic point of view; when looking at tools, and more specifically at organizational assessment and monitoring activities, this longer-term perspective is missing.

5. Conclusions and managerial implications

In accordance with the paper's primary goal, many attempts to systematize contributions on e-HRM platforms have been made; this confirms the increasing attention given to this topic by scholars. Compared to the previous literature analyses studied, the main aim is to shed new light on the key issues underlying literature on e-HRM platforms and point out the main perspectives adopted in their business application.

Data were first provided and then analyzed, defining what these platforms really are, to understand their issues and attributes. Research questions were then presented to address the gaps in the topic areas.

During the analysis, results show which journals write most on the topic, the countries the authors come from (mainly Asia), and that the timeframe 2018-2022 has been the most prolific, showing how the topic has been growing quickly in the last few years. In more recent years, e-HRM platforms were declined as follows: there are five key issues (technology, strategy, organizational performance, assessment and recruiting) and two main perspectives (tactical-strategic and performance-activity).

The results reveal new insights into the theoretical foundations and the key issues underpinning e-HRM platforms in general and their relevance through an MDS analysis. In addition, the growing number of studies that define the importance of such platforms and clarify their key issues may stimulate more dynamic theories and promote research designs that explicitly investigate the development of e-HRM platforms and their future developments.

This paper could therefore help identify future research lines on the topic. Although some authors who have analyzed the impact of e-HRM platforms (Strohmeier and Kabst, 2009; Bissola and Imperatori, 2013; Bondarouk *et al.*, 2017) have emphasized that the use of these platforms should take a long-term view, the literature actually has a more tactical focus. Many papers look only at short-term performance; for this reason, scholars should study these platforms with a longer time perspective in mind. From a theoretical point of view, it would be interesting in future research to develop an analysis with a more strategic perspective.

The paper does have some limitations, mostly in relation to the adopted methodology, such as the choices made concerning the keywords used and, as a consequence, the articles included in the analysis.

In particular, the adoption of the term e-HRM led to the exclusion of other terms related to the specific phenomenon so that, given rapid developments in recent years, the keywords used may not fully express the issue. The criterion was to include only those articles in which these typologies were analyzed relating to the overall concept of e-HRM. It is recognized that this can be seen as a limitation, but it also opens a path for further studies. Another limitation might be related to the databases used, as some papers relevant to the research might not be in the one analyzed.

Furthermore, the selection of the particular subject areas to be analyzed in the MDS could be subjective. However, the S-stress value can mitigate this risk, suggesting that the representation of the data is reliable, and that the map can identify latent semantic dimensions.

Managers should use the analysis to understand better the key issues regarding these platforms. The analysis provided by this study can help managers solve practical issues that companies might face. A better framing of e-HRM platforms and their main key issues allows the identification of processes and methodologies that can help companies better understand how they can benefit from the adoption of e-HRM platforms that can lead to the development of entirely new markets.

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Chiara Ottolenghi
Human resource
management shaped in a
platform: a literature review

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sinergie
italian journal of management

ISSN print 0393-5108
ISSN online 2785-549X
DOI 10.7433/s122.2023.09
pp. 193-213

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Unveiling the relationship between women on board and woman CEO selection: what is the role of sustainability governance?

Received
21st September 2022

Revised
14th February 2023

Accepted
6th December 2023

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Abstract

Frame of the research: Studies highlight challenges affecting woman CEO selection. However, the literature falls short in emphasizing proactive measures and supportive conditions crucial for women's success in organizational leadership.

Purpose of the paper: Several companies nowadays are committed to improving the presence of women at the corporate apex. However, little is known about the factors able to facilitate women's access to the CEO role. This paper relies on critical mass theory to investigate whether the presence of a critical mass of women on board facilitates the appointment of a woman CEO. Moreover, the paper investigates whether the presence of a sustainability committee on board strengthens the relationship between women on board and a woman CEO appointment. Lastly, the paper examines whether the presence of a sustainability-linked incentive system strengthens such a relationship.

Methodology: Analyses are performed on a sample of companies listed in the most important market of developed countries (S&P100, FTSE100, IBEX35, DAX30, CAC40, SMI). The time frame is about ten years (2010-2019). To test the hypothesis, we first ran a regression analysis. Later, we ran robustness tests adopting different matching techniques.

Findings: Results show a positive linkage between the presence of a critical mass of women on board and the presence of a woman CEO. In addition, results show that such a link is stronger when the company sets up a sustainability committee on board. Lastly, the results indicate that such a link is stronger when the company has a sustainability-linked incentive system for board members.

Research limits: Our study's sample is confined to particular businesses in developed nations, with a particular emphasis on the United States, the United Kingdom, Spain, Germany, France, and Switzerland. The concentration on these geographical regions prompts contemplation about the broader relevance of our results. Additionally, our sample consists solely of publicly traded companies, a deliberate choice aimed at guaranteeing the comprehensiveness of the data essential for our analyses.

Practical implications: The results must be taken with care as people belonging to different interests' groups or categories could interpret them differently. For women, our empirical results may seem like one more reason to break the glass ceiling and promote workplace inclusion at the top of companies. For men, this empirical evidence could instead be interpreted as a mechanism that rewards people based on whether or not they belong to a certain demographic group and not so much based on the skills and abilities they possess. In essence, men may perceive that as the critical mass of women on boards increases, so does the likelihood that men will be excluded from top positions.

Originality of the paper: *This study investigates a phenomenon currently under-investigated in literature, namely the antecedents of having a woman CEO. In addition, the study investigates the possible role played by a company's effort toward sustainability in strengthening the relationship between women's presence on the board and a woman CEO selection.*

Key words: women on board; woman CEO; women at the top; sustainability committee; sustainability-linked incentive system

1. Introduction

Numerous companies have recently affirmed their steadfast commitment to advancing greater female participation within their organizational structure, particularly in elevating women to leadership positions. The motivations driving this commitment vary widely. On one hand, some argue that an increased presence of women within an organizational context can significantly enhance business decision-making, ultimately influencing organization-level outcomes (Arfken *et al.*, 2004; Lückerath-Rovers, 2013; Bart and McQueen, 2013; Post and Byron, 2015; Adams *et al.*, 2015; Chen *et al.*, 2019). Conversely, another perspective asserts that fostering a greater presence of women in the company is fundamentally the right thing to do, irrespective of its potential impact on organizational outcomes (Robinson and Dechant, 1997; Terjesen *et al.*, 2009; Ng and Wyrick, 2011).

Empirically, scholars have tested and confirmed a positive causal relationship between the presence of women in top leadership positions and corporate performance, as well as corporate innovation (Torchia *et al.*, 2011; Isidro and Sobral, 2015). However, despite the proven benefits of having women at the helm for corporate success, a stark gender disparity persists, with the number of women CEOs consistently lagging behind that of men (Singh and Vinnicombe, 2004; Liu, 2013; Smith and Parrotta, 2018). Despite the considerable body of research that has delved into the myriad barriers impeding women's progress in attaining top leadership positions, a critical void persists in our understanding of the positive factors that can actively facilitate and empower women to ascend to the coveted role of Chief Executive Officer (CEO).

While existing studies have diligently highlighted the challenges, ranging from gender biases to structural impediments, which hinder women's progression in corporate hierarchies (Eagly, 2004; Ryan and Haslam, 2005; Chizema *et al.*, 2015; Geletkanycz, 2020), there is a discernible gap in literature addressing the proactive mechanisms and supportive conditions essential for fostering women's successful journey to the pinnacle of organizational leadership.

As we navigate the intricate landscape of gender dynamics in the corporate world, understanding the barriers alone is insufficient. To effect meaningful change and promote gender equality in executive leadership, we must pivot our focus towards comprehending the catalysts that can propel capable women into CEO roles. By identifying and

comprehensively analyzing these enabling factors, we can bridge the existing gap in knowledge while also contributing invaluable insights to organizations, policymakers, and scholars alike.

A significant gap in the existing literature exists due to the absence of a comprehensive theoretical model that substantiates how specific board-level constructs influence the decision-making process in appointing a woman as CEO. The factors that truly drive the appointment of a woman as CEO remain unclear, which underscores the need for thorough exploration and empirical scrutiny. This article aims to address this gap in the literature.

First, drawing on the critical mass theory, we theorize that the presence of a critical mass of women on the board facilitates the appointment of a woman as CEO. Since the board is responsible for CEO appointments and women are typically a minority on the board, a critical mass of women should make it easier to appoint a woman as CEO. Second, we theorize that the presence of a sustainability committee within the board strengthens the relationship between women's presence on the board and the appointment of a woman as CEO. The existence of a sustainability committee has the potential to promote gender equality within the company and dispel gender stereotypes that often hinder women from reaching leadership positions. Third, we theorize that the presence of a sustainability-linked incentive system for board members strengthens the relationship between women's presence on the board and the selection of a woman as CEO. Including sustainability targets in the incentive system may support women directors' efforts to advance gender equality within the company.

To test our hypotheses, we examined a sample of publicly traded companies operating in developed countries, namely the United States, the United Kingdom, France, Germany, Spain, and Switzerland. The results reveal that the presence of a critical mass of women positively influences the likelihood of having a woman as CEO. Furthermore, the results indicate that this positive relationship is stronger when the company has a sustainability committee on the board. Lastly, the results suggest that this positive relationship is stronger when the company implements a sustainability-linked incentive system for board members.

Our empirical findings contribute to various research streams. First, we contribute to the literature on women on boards by demonstrating that their presence is not only beneficial for corporate performance and innovation but also for facilitating women's access to the CEO role. Second, we contribute to the limited literature on women CEOs by identifying factors that can facilitate their access to top positions. Third, we contribute to the literature on sustainable corporate governance by showing that specific sustainability mechanisms can lower barriers that often hinder women from reaching top positions within a company.

The remainder of the paper is organized as follows. First, we provide an overview of the theoretical background and develop our hypotheses. Next, we outline the data, constructs, and methods employed. Later, we present the empirical results. Finally, we discuss the results, practical implications, and limitations, offering recommendations for future research.

2. Theoretical background

Several academics have confirmed that people prefer to work with people who are demographically similar to them (Useem and Karabel, 1986; Tajfel and Turner, 1986). In a similar vein, some researchers have found that people tend to favor people who are demographically similar to them when it comes to deciding whether to hire or promote someone (Latham *et al.*, 1975; Rand and Wexley, 1975; Zajac and Westphal, 1996). This phenomenon can also be observed when the board of directors is deciding who will be the next CEO. If this is the case, male directors should be more likely to support a male CEO candidate. Women directors, on the other hand, should be more likely to support a woman CEO's candidacy. What happens when there is only one woman on board? Is the latter able to influence board decisions and ultimately lead to the appointment of a woman CEO? It is an established fact that although the number of women at the top is constantly increasing, women on board turn out to be a "minority group" (Torchia *et al.*, 2011; Jia and Zhang, 2013). However, the status of the "minority group" that characterizes women on board could change when the number of women exceeds a certain threshold value, the so-called "critical mass". Critical mass theory posits that as the number of individuals in a minority group increase, there is a significant transformation in power dynamics between the minority and majority (Granovetter, 1978; Kanter, 1977). When the size of the minority group surpasses a particular threshold, the influence that the minority group holds over the majority group experiences a notable surge. The attainment of this threshold is often viewed as a point of no return, signifying a critical juncture capable of instigating genuine change. According to Gladwell (2006), reaching this threshold is akin to a "magic moment" when a social behavior starts spreading rapidly. It is important to note, however, that critical mass theory doesn't precisely specify a value-specific threshold; rather, it asserts that when the size of the minority group surpasses a certain point, the power dynamics between the minority and majority groups undergo a significant shift (Joecks *et al.*, 2013). Empirical studies conducted thus far on women's ability to influence boardroom decisions have revealed that the presence of a single woman, as well as the presence of two women, is insufficient to change boardroom dynamics (Loyd *et al.*, 2008; Chang *et al.*, 2019). Certain studies have indicated that the "magic number" in critical mass theory is three—namely, the number that ensures the minority group wields a substantial level of influence over the majority group (Asch and Guetzkow, 1951; Konrad *et al.*, 2008). The consensus surrounding this threshold highlights its crucial role in triggering meaningful impact and cultivating increased influence for women within the boardroom. Consequently, the assertion is that the presence of a critical mass of women, specifically when there are at least three women on the board, should have a positive impact on the appointment of a woman as CEO.

Hypothesis 1: The presence of a critical mass of women directors on the board facilitates the appointment of a woman CEO.

The company's broader dedication to promulgating gender equality may act as a contributing factor in shaping this dynamic relationship. The specific conditions that could strengthen the linkage between the presence of women on the board and the appointment of a woman as CEO remain ambiguous (You, 2021). In an environment that is less adversarial towards women, it is plausible that this could intensify the positive correlation between the presence of women on the board and the likelihood of selecting a woman as CEO. A workplace culture actively endorsing gender diversity, fostering inclusiveness, and ensuring equal opportunities for women might contribute to a more conducive environment for appointing women to senior leadership roles (Shore *et al.*, 2018). The extent to which an organization actively fosters a non-hostile and supportive environment for women emerges as a potential catalyst, strengthening the connection between a critical mass of women on the board and the elevation of a woman to the CEO role. This alignment could be particularly conspicuous in companies overseeing sustainability issues, as they are likely to prioritize not only environmental conservation but also engage actively in initiatives promoting gender equality and women's inclusion in the workplace (Razavi, 2016; Esquivel and Sweetman, 2016). Indeed, among the various objectives of the United Nations 2030 Agenda, or the Sustainable Development Goals, are not only concerns about preserving natural resources and addressing global warming but also ensuring women's full participation in the labor force, encompassing leadership positions (Grosser, 2009; Koehler, 2016; García-Sánchez *et al.*, 2023). Notably, the creation of a decision-making body responsible for directing and monitoring the company's social and environmental efforts is one of the ways through which companies are trying to contribute to these objectives. Such a governance body is commonly defined as a "sustainability committee" (Valle *et al.*, 2019; Minciullo *et al.*, 2022). The establishment of a sustainability committee is a voluntary decision, in contrast to other governing bodies, such as the audit and compensation committees (Endrikat *et al.*, 2020) to actively promote a corporation's positive impact on the natural environment and society as a whole. Beyond promoting responsible behavior in favor of the natural environment, the presence of a sustainability committee could also be able to promote gender equality within the organization and break down all the gender stereotypes that often prevent women's access to leadership positions. For instance, in a company where there is a sustainability committee on board, the cultural barriers that often characterize board meetings when choosing the next CEO could disappear. Therefore, we posit the following hypothesis:

Hypothesis 2: If the company has a sustainability committee on board, the effect of the presence of a critical mass of women on board on the appointment of a woman CEO will be stronger.

A growing number of companies are adopting comprehensive strategies to integrate sustainability into their corporate governance frameworks. In addition to establishing sustainability committees responsible for overseeing management's sustainability efforts, there is a rising trend of incorporating

sustainability targets into the remuneration systems of board directors (Maas and Rosendaal, 2016). This multifaceted approach aims not only to monitor sustainability practices but also to align the interests of the board with those of various stakeholders, including the natural environment, civil society, suppliers, and customers (Hartikainen *et al.*, 2021; Minciullo *et al.*, 2022). This innovative solution not only promotes responsible corporate behavior but also acts as a catalyst for achieving sustainability objectives, covering environmental concerns such as CO2 emissions and energy consumption, as well as social issues like gender parity and addressing the gender pay gap (Esquivel and Sweetman, 2016). While the direct impact of sustainability targets on promoting gender equality within organizations is yet to be empirically demonstrated, the inclusion of such targets in the incentive systems of directors may empower women directors (Minciullo *et al.*, 2022). This empowerment could be reflected in heightened efforts to advocate for gender equality and challenge prevailing stereotypes that often hinder women's access to leadership positions. Conversely, in companies lacking a sustainability-linked incentive system, the motivation for women directors to champion gender equality within the organization might be diminished. For this reason, we posit the following hypothesis:

Hypothesis 3: If the company has a sustainability-linked incentive system for board members, the effect of the presence of a critical mass of women on board on the appointment of a woman CEO will be stronger.

3. Methodology

3.1 Sample

To comprehend the subject under investigation, a decision was made to analyze a sample of companies possessing specific characteristics. Firstly, it was decided to focus exclusively on publicly traded companies. This selection is driven by the imperative to amass a sufficiently robust dataset devoid of missing values, facilitating the execution of comprehensive regression analyses on an extensive sample. Given that publicly traded companies are obligated to disclose both economic data and details about the composition of their board of directors, it was deemed reasonable to center the investigation around this category of enterprises. Secondly, the decision was taken to exclusively examine companies listed on the stock exchanges of developed nations, particularly in the United States and Europe. This choice emanates from the necessity to garner an ample number of observations featuring a woman CEO, thereby enabling the execution of rigorous regression analyses. In the United States, as delineated in a World Economic Forum article, merely 15% of Fortune-listed companies are led by a woman CEO. In Europe, as elucidated in a study presented by European Women on Boards, a mere 7% of companies boast a woman CEO. In scrutinizing Europe, specific attention was directed towards nations where women wield a conspicuous presence on corporate boards, including Spain, Germany, the United Kingdom, France,

and Switzerland. Therefore, the sample under investigation comprises companies belonging to the following stock indexes: S&P100, FTSE100, IBEX 35, DAX30, CAC40, and SMI. The S&P100 index includes 100 large-cap firms in the United States, whereas the FTSE100 index includes 100 large-cap companies in the United Kingdom. IBEX35 is made up of 35 large-cap Spanish companies, DAX30 consists of thirty large-cap German companies, CAC40 is made up of forty large-cap French companies, and SMI comprises twenty large-cap Swiss companies. Our sample reflects the largest publicly traded companies, thereby offering a comprehensive representation of major players in the corporate landscape. Overall, our sample comprises 325 firm-year observations.

The period taken into consideration is ten years (2010-2019). This decision derives from the need to avoid the years of the financial crisis (2007-2008) and the years immediately following (2009) from the analysis. Data collection for this study relied on the Bloomberg database, a widely recognized and reliable source for financial and governance information.

3.2 Variables

Dependent variable. The dependent variable considered in this article is the appointment of a woman CEO. To measure this construct, a binary variable was created. This variable takes on the value “1” if the CEO in office in a given year is a woman and “0” if the CEO is a man (Knippen, *et al.*, 2018; You, 2021).

Independent variable. The focal independent variable in this article is the presence of a critical mass of women on the board. In the realm of gender-based studies, the concept of women on the board entails a comprehensive exploration of the representation, influence, and impact of women within corporate governance structures. It pertains to the inclusion of women serving on the boards of directors of organizations, a pivotal aspect of contemporary discussions on gender diversity and equality in the corporate sphere. Our analysis revolves around the disclosure of information by companies, as the perceived identity of board members is not within our purview. As expounded in the theoretical background section, a critical mass of women is defined as the presence of three or more women on the board. To quantify this construct, a binary variable was created, taking the value “1” if there are at least three women on the board and “0” if the number of women is less than three (Torchia *et al.*, 2011).

Moderating variables. Two moderating variables were considered in this study. The first one pertains to the presence or absence of a sustainability committee within the board. To gauge this construct, a binary variable was formulated. This variable assumes the value “1” if the company has a sustainability committee on the board in a given year and “0” otherwise (Minciullo *et al.*, 2022). The second one concerns the presence or absence of a sustainability-linked incentive system for board members. This variable takes on the value “1” if the company has a sustainability-linked incentive

system for board members in a given year and “0” otherwise (Minciullo *et al.*, 2022).

Control variables. Several control variables were introduced in the analyses as multiple factors could affect the appointment of a woman CEO. First, it was decided to consider four organizational variables: firm size, firm performance, financial leverage, and growth opportunities. Firm size was measured using the natural logarithm of total assets as a proxy. Logarithm transformation was chosen to address potential skewness in the distribution of firm size values, ensuring a more statistically sound analysis. Firm performance was assessed using return on assets, as outlined by Abernethy *et al.* (2019). To bolster robustness, additional analyses were conducted, incorporating return on equity and, alternatively, return on investment as performance metrics. Financial leverage was quantified using the debt-to-equity capital ratio, as per Mishra *et al.* (2020). Growth opportunities were gauged by considering the ratio between market value and the book value of shareholders’ equity, following the approach of Thams *et al.* (2020). Two governance variables were included in the analysis: board size and board independence, as defined by Abernethy *et al.* (2019). Board size was measured using the total number of boardroom directors as a proxy.

Board independence was measured by determining the percentage of independent directors out of the total. Furthermore, a decision was made to incorporate a dummy variable to account for the effects stemming from ownership structure characteristics, in line with Hambrick and Finkelstein (1995). To measure ownership structure, a binary dummy variable was constructed, assuming values of “1” or “0” based on the identity of the owner with the majority shareholding, commonly known as the top owner. The dummy variable takes the value of “1” when the ownership structure falls into specific categories based on the identity of the top owner: banks, corporations, family offices, foundations, governments, holding companies, individuals, investment advisors, private equity, and trusts. Additionally, dummy variables were added to consider year effects, country effects, and industry effects. Finally, a dummy variable was introduced, assuming the value of “1” or “0” based on the presence of a binding gender quota in the country where the company is listed, following the study by Casaca *et al.* (2022). The complete list of variables considered, along with their descriptions, is provided in the Appendix.

3.3 Analyses

Descriptive statistical analyses were first carried out. A Pearson correlation matrix was created in a subsequent step to confirm the presence of a correlation between the independent variable and the dependent variable. In the third step, regression analysis was utilized to test the hypothesis. Panel data analyses were employed to investigate dynamics over time, utilizing statistical methods that consider both cross-sectional and time-series variations. This approach facilitates a thorough exploration of the interactions between variables across diverse entities

and time periods, thereby enhancing the depth and precision of the study's findings. Given the binary nature of the dependent variable, it was decided to perform a regression analysis using the Logit model and, subsequently, a regression analysis using the Probit model. The utilization of the Probit model is particularly fitting for our study, given its appropriateness for binary outcomes, providing an effective framework for assessing the probability of a woman being appointed as CEO. The Logit model contributes to the robustness of our analysis by adeptly handling nonlinear relationships, allowing us to capture the nuanced and intricate dynamics that may impact the outcome variable. This methodological choice ensures a comprehensive and rigorous examination of the factors impacting the appointment of women CEOs in our study. The STATA statistical package, specifically utilizing the `xtprobit` and `xtlogit` commands, was employed to execute our statistical analyses.

4. Findings

Table 1 shows the results derived from the descriptive statistical analyses (mean, standard deviation, minimum and maximum). Table 2, on the other hand, displays the results derived from the correlation analysis. The correlation coefficient between having a critical mass of women on the board and the selection of a woman as CEO is positively aligned, albeit relatively small, yet statistically significant (correlation coefficient = 0.10, p-value < 0.05). This finding is consistent with our initial hypothesis, although it does not assure the existence of a causal relationship between the independent and dependent variables. Additionally, it is notable that the correlation coefficient between firm size and the appointment of a woman as CEO is positive and statistically significant (correlation coefficient = 0.04, p-value < 0.05).

Tab. 1: Descriptive statistics

| Variables | Mean | Standard Deviation | Minimum | Maximum |
|----------------------------------|---------|--------------------|----------|-----------|
| Woman CEO | .037 | .189 | 0 | 1 |
| Critical Mass WOB | .52 | .5 | 0 | 1 |
| Sustainability Committee | .373 | .484 | 0 | 1 |
| Sustainability-linked incentives | .322 | .467 | 0 | 1 |
| Firm size | 24.224 | 1.887 | 17.467 | 28.622 |
| Firm performance | 6.46 | 12.823 | -59.76 | 236.78 |
| Financial leverage | 157.664 | 900.078 | -109.391 | 38429.412 |
| Growth opportunities | 6.294 | 34.836 | .005 | 895.232 |
| Board size | 12.063 | 3.224 | 3 | 23 |
| Board independence | 71.368 | 18.707 | 0 | 100 |

Source: our elaboration

Tab. 2: Correlation matrix

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|--------------------------------------|-------|-------|--------|--------|--------|--------|-------|--------|--------|------|
| (1) Woman CEO | 1.00 | | | | | | | | | |
| (2) Critical Mass WOB | 0.10* | 1.00 | | | | | | | | |
| (3) Sustainability Committee | 0.07* | 0.21* | 1.00 | | | | | | | |
| (4) Sustainability-linked incentives | 0.02 | 0.12* | 0.30* | 1.00 | | | | | | |
| (5) Firm size | 0.04* | 0.27* | 0.22* | 0.15* | 1.00 | | | | | |
| (6) Firm performance | -0.01 | -0.02 | -0.07* | -0.05* | -0.22* | 1.00 | | | | |
| (7) Financial leverage | 0.01 | 0.01 | -0.01 | 0.00 | 0.01 | 0.00 | 1.00 | | | |
| (8) Growth opportunities | -0.01 | 0.01 | -0.03 | -0.04* | -0.12* | 0.55* | 0.56* | 1.00 | | |
| (9) Board size | -0.03 | 0.39* | 0.07* | 0.08* | 0.46* | -0.16* | -0.01 | -0.07* | 1.00 | |
| (10) Board independence | 0.03 | 0.14* | 0.07* | 0.08* | 0.32* | 0.04* | 0.03 | 0.04* | -0.06* | 1.00 |

** p<0.01, * p<0.05, + p<0.1

Source: our elaboration

Table 3 shows the results derived from the regression analysis with a logit model. In model 1, regression analyses were performed by entering only the control variables. The values reveal the existence of a statistically positive influence of firm size on the dependent variable ($b = 0.303$; p -value < 0.01). This implies that as the size of the company increases, the likelihood of having a woman CEO also increases. Moreover, the findings indicate a negative and statistically significant impact of board size on the dependent variable. ($b = -0.126$; p -value < 0.01). This means that the larger the size of the boardroom the lower the probability of having a woman CEO. In model 2, alongside the entry of control variables, the independent variable under scrutiny was entered as well. The outcomes demonstrate a positive and statistically significant impact of having a critical mass of women on the board on the dependent variable ($b = 1.528$; p -value < 0.01). This means that the presence of a critical mass of women on board facilitates the appointment of a woman CEO.

Therefore, the first hypothesis developed in this article is verified. In model 3, in addition to entering the control variables and the independent variable, we entered the variable related to the presence or not of a sustainability committee on board. According to the findings, such a governance feature does not directly influence the appointment of a woman CEO ($b = 0.117$; p -value > 0.05). In model 4, we added the variable related to the presence or not of a sustainability-linked incentive system for board members. Even in this case, the results indicate that such a governance feature does not directly affect the dependent variable. In model 5, we tested whether the presence of a sustainability committee on board strengthens the relationship between the presence of a critical mass of women on board and a woman CEO selection. The beta coefficient related to the interaction term is positive and significant ($b = 0.324$; p -value < 0.01). Therefore, the second hypothesis developed in this paper is verified. Lastly, in model 6, we tested whether the presence of a sustainability-linked incentive system for board members strengthens the relationship between the presence of a critical mass of women on board and a woman CEO selection. Even in this case, the beta coefficient is positive and significant ($b = 0.127$; p -value < 0.01), which verifies the third hypothesis. Overall, the beta coefficient related to

the influence of a critical mass of women on a woman CEO appointment is positive and significant in all the regression models. Although not very high, the R squared increases when passing from model 1 to model 6. After the regression analyses, VIF tests were conducted to verify the presence of multicollinearity. All VIF values were found to be below the cutoff value of 10.

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Tab. 3: Regressions with a logit model

| | (1) Woman CEO | (2) Woman CEO | (3) Woman CEO | (4) Woman CEO | (5) Woman CEO | (6) Woman CEO |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Firm size | 0.303** (0.088) | 0.284** (0.090) | 0.292** (0.091) | 0.285** (0.090) | 0.301** (0.093) | 0.283** (0.091) |
| Firm performance | -0.013 (0.017) | -0.019 (0.017) | -0.019 (0.017) | -0.019 (0.017) | -0.018 (0.017) | -0.019 (0.017) |
| Firm leverage | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) |
| Growth opportunities | -0.016 (0.020) | -0.015 (0.020) | -0.015 (0.020) | -0.015 (0.020) | -0.015 (0.020) | -0.015 (0.020) |
| Board size | -0.126** (0.047) | -0.223** (0.053) | -0.223** (0.053) | -0.223** (0.053) | -0.226** (0.054) | -0.222** (0.054) |
| Board independence | -0.001 (0.007) | -0.009 (0.008) | -0.009 (0.008) | -0.009 (0.008) | -0.009 (0.008) | -0.009 (0.008) |
| CMWOB | | 1.528** (0.296) | 1.540** (0.298) | 1.528** (0.296) | 1.418** (0.360) | 1.569** (0.345) |
| Sustainability Committee | | | 0.117 (0.244) | | 0.374 (0.505) | |
| Sustainability-linked incentives | | | | 0.014 (0.239) | | 0.085 (0.479) |
| CMWOB X Sustainability Committee | | | | | 0.324** (0.551) | |
| CMWOB X Sustainability-linked incentives | | | | | | 0.127** (0.532) |
| Constant | -8.118** (2.027) | -6.458** (2.080) | -6.604** (2.105) | -6.471** (2.092) | -6.719** (2.117) | -6.469** (2.093) |
| Ownership structure | Yes | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes | Yes |
| Country | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes | Yes | Yes | Yes |
| Binding gender quota | Yes | Yes | Yes | Yes | Yes | Yes |
| Pseudo R ² | 0.142 | 0.179 | 0.180 | 0.180 | 0.190 | 0.190 |

Standard errors are in parentheses; CMWOB stands for Critical Mass of Women on Board

** p<.01, * p<.05, + p<.1

Source: our elaboration

Further robustness tests were conducted to understand whether the results found were statistically robust. Firstly, regressions with a probit model were conducted. Results are reported in Table 4. In line with previous findings, the beta coefficient related to the presence of a critical mass of women is positive and significant in all the models. Furthermore, in model 5, we again tested whether the presence of a sustainability committee on board strengthens the relationship between the presence of a critical mass of women on board and a woman CEO selection. The beta coefficient related to the interaction term is positive and significant (b = 0.142; p-value<0.01). In model 6, we again tested whether the presence of a sustainability-linked incentive system for board members strengthens the relationship between the presence of a critical mass of women on board and a woman CEO selection. Even in this case, the beta coefficient is positive and significant (b = 0.078; p-value<0.01).

Tab. 4: Regressions with a probit model

| | (1) Woman CEO | (2) Woman CEO | (3) Woman CEO | (4) Woman CEO | (5) Woman CEO | (6) Woman CEO |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Firm size | 0.151** (0.045) | 0.150** (0.046) | 0.152** (0.047) | 0.150** (0.046) | 0.156** (0.047) | 0.149** (0.046) |
| Firm performance | -0.005 (0.008) | -0.008 (0.009) | -0.008 (0.009) | -0.008 (0.009) | -0.008 (0.009) | -0.009 (0.009) |
| Firm leverage | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) | 0.000 (0.000) |
| Growth opportunities | -0.005 (0.008) | -0.006 (0.008) | -0.006 (0.008) | -0.006 (0.008) | -0.006 (0.008) | -0.006 (0.008) |
| Board size | -0.067** (0.024) | -0.118** (0.027) | -0.118** (0.027) | -0.118** (0.027) | -0.119** (0.027) | -0.117** (0.027) |
| Board independence | -0.002 (0.004) | -0.006 (0.004) | -0.006 (0.004) | -0.006 (0.004) | -0.006 (0.004) | -0.006 (0.004) |
| CMWOB | | 0.779** (0.144) | 0.781** (0.145) | 0.779** (0.144) | 0.727** (0.175) | 0.804** (0.167) |
| Sustainability Committee | | | 0.026 (0.123) | | 0.133 (0.233) | |
| Sustainability-linked incentives | | | | 0.001 (0.124) | | 0.056 (0.224) |
| CMWOB X Sustainability Committee | | | | | 0.142** (0.261) | |
| CMWOB X Sustainability-linked incentives | | | | | | 0.078** (0.254) |
| Constant | -4.064** (1.006) | -3.400** (1.036) | -3.429** (1.049) | -3.401** (1.042) | -3.490** (1.056) | -3.388** (1.042) |
| Ownership structure | Yes | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes | Yes |
| Country | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes | Yes | Yes | Yes |
| Binding gender quota | Yes | Yes | Yes | Yes | Yes | Yes |
| Pseudo R ² | 0.142 | 0.181 | 0.181 | 0.181 | 0.190 | 0.190 |

Standard errors are in parentheses; CMWOB stands for Critical Mass of Women on Board

** p<.01, * p<.05, + p<.1

Source: our elaboration

Similar to many studies in the realm of corporate governance, this investigation suffers from sample selection bias and endogeneity. Sample-selection bias entails the non-random selection of specific companies based on the availability of observable data, while endogeneity arises when the independent variable is correlated with other unobserved variables. To effectively counteract these inherent biases, the study employed both propensity score matching (PSM) and nearest neighbor matching (NNM) techniques. Propensity score matching and nearest neighbor matching are well-established methodologies frequently utilized in observational studies (Chatjuthamard *et al.*, 2022), particularly in situations where there are limited comparable observations in the control sample (comprising companies with a critical mass of women on the board) compared to the reference sample (comprising companies without a critical mass of women on the board). These techniques contribute to ensuring a more balanced and meaningful comparison, addressing the challenges posed by the distinct characteristics of the two groups and enhancing the reliability of the study's findings. The matching was performed considering all the control variables previously used in the regression analysis. The results are reported in Table 5. Overall, the empirical findings are in line with what was previously found.

Tab. 5: Propensity score matching and nearest neighbor matching

| | (1) PSM | (2) NNM | (3) PSM | (4) NNM | (5) PSM | (6) NNM |
|--|------------------|------------------|------------------|------------------|------------------|------------------|
| CMWOB | .072** (.011) | .060** (.011) | | | | |
| CMWOB X Sustainability Committee | | | .051** (.016) | .056** (.015) | | |
| CMWOB X Sustainability-linked incentives | | | | | .052** (.014) | .034** (.013) |
| Firm size | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm performance | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm leverage | Yes | Yes | Yes | Yes | Yes | Yes |
| Growth opportunities | Yes | Yes | Yes | Yes | Yes | Yes |
| Board size | Yes | Yes | Yes | Yes | Yes | Yes |
| Board independence | Yes | Yes | Yes | Yes | Yes | Yes |
| Ownership structure | Yes | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes | Yes |
| Country | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes | Yes | Yes | Yes |
| Binding gender quota | Yes | Yes | Yes | Yes | Yes | Yes |

Standard errors are in parentheses; CMWOB stands for Critical Mass of Women on Board

** p<.01, * p<.05, + p<.1

Source: our elaboration

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5. Discussions and conclusions

Since the 1990s, a growing body of research has extensively examined the intricate relationship between the representation of women on corporate boards and organizational performance. Central to this discourse is the “business case” advocating for women’s presence at the corporate summit, asserting that an increased representation of women in top leadership is not only a moral imperative but also a strategic advantage benefiting businesses (Hoobler *et al.*, 2018). Despite the recognized benefits of having women in leadership roles, a persistent gender disparity is evident, particularly in the scarcity of women CEOs compared to their male counterparts (Singh and Vinnicombe, 2004; Liu, 2013; Smith and Parrotta, 2018).

Exploring the factors influencing the appointment of women CEOs reveals a nuanced and evolving landscape. While the existing literature is rich, it lacks a comprehensive theoretical model capable of unraveling the intricate web of board-level constructs influencing decisions about appointing a woman CEO (Eagly, 2004; Ryan and Haslam, 2005; Chizema *et al.*, 2015; Geletkanycz, 2020). This paper addresses this gap by subjecting a sample of companies listed in the main markets of advanced economies to rigorous analysis, examining whether the presence of a critical mass of women on boards facilitates the appointment of a woman CEO. Additionally, we explore the moderating role of sustainable governance.

The empirical results affirm a positive and statistically significant impact of a critical mass of women on the appointment of a woman CEO, aligning with critical mass theory, which suggests that as the number of individuals from a minority group increases, so does their influence over the majority group (Granovetter, 1978; Kanter, 1977). Furthermore, our results align with previous organizational studies indicating a bias favoring individuals with similar demographic characteristics in hiring decisions (Latham *et al.*, 1975; Rand and Wexley, 1975; Zajac and Westphal, 1996).

Beyond confirming existing theories, this manuscript introduces novel theoretical insights by exploring the intersection of sustainability-related governance mechanisms and the relationship between women on boards and the selection of a woman CEO. The analyses reveal that the presence of a sustainability committee within the board reinforces the connection between women's board representation and the appointment of a woman CEO. Additionally, the analyses highlight that this causal link is more robust when the company implements a sustainability-linked incentive system. This nuanced exploration enhances our understanding of the dynamics at play and provides valuable considerations for advancing gender equality and sustainable governance practices within corporate leadership structures.

Our research findings intricately intersect with several distinct scholarly inquiries. Firstly, our study contributes to the existing literature on women on boards by illustrating that their presence not only positively influences corporate performance and innovation (Torchia *et al.*, 2011; Isidro and Sobral, 2015) but also plays a crucial role in fostering greater gender diversity within the executive suite, particularly in the journey to the CEO role. By unraveling the interconnectedness of women's presence on boards with their access to top leadership positions, we contribute to a more holistic understanding of the multifaceted implications of gender diversity in corporate governance.

Furthermore, our study makes a notable contribution to the relatively sparse literature on women CEOs. While women currently constitute a minority in CEO roles, our research sheds light on crucial factors that can facilitate their trajectory to these upper echelons of leadership. This nuanced perspective challenges preconceived notions and highlights that, despite being underrepresented, women can overcome barriers with the right conditions and support systems.

In a distinctive vein, our investigation addresses a long-standing and underexplored research question: the governance features that either amplify or diminish the influence of a critical mass of women on board in the selection of a woman CEO. Recent scholarly distinctions between generic corporate governance mechanisms and sustainability-related corporate governance mechanisms (Minciullo *et al.*, 2022) provide a conceptual framework for our analysis. Sustainability-related mechanisms are purposefully designed to integrate socio-environmental issues into decision-making processes, aiming to bring these critical matters to the forefront of board discussions. Generic mechanisms, in contrast, are broad governance tools that enhance overall corporate governance, impacting various facets of the firm.

Our study significantly advances the discourse on sustainability-related corporate governance mechanisms by revealing their role in dismantling barriers that often impede women from attaining top leadership positions. By showcasing the distinct impact of sustainability-focused governance measures, we contribute not only to the board gender diversity conversation but also to the evolving understanding of the broader role of sustainability practices in reshaping corporate leadership dynamics.

One significant ramification of our findings is that an increase in the number of women on the board, surpassing a specific threshold, correlates with an amplified influence on the selection of a woman CEO. However, the interpretation of this result may vary among different interest groups. For women, it could be perceived as an additional motivation to shatter the glass ceiling and advocate for workplace inclusivity at the upper echelons of companies. Conversely, men might interpret this empirical evidence as a mechanism that favors individuals based on demographic criteria rather than skills and abilities, potentially raising concerns about exclusion from top positions as the critical mass of women on boards grows. A foreseeable challenge is that companies might introduce tools for selecting top management figures, such as CEOs, that mitigate cognitive biases inherent in human decision-making.

A second key implication is that a company's commitment to sustainability appears to diminish the unseen barriers preventing women from attaining top leadership positions. It is crucial to approach this result with caution, as the findings don't establish a direct relationship between the presence of a sustainability committee and the appointment of a woman CEO. Instead, the results indicate a moderating relationship - when there is a sustainability committee on the board, the connection between women on the board and the selection of a woman CEO becomes stronger. This suggests that companies aspiring to genuine inclusivity for women can enhance their efforts by establishing governance bodies dedicated to pursuing social and environmental sustainability goals. Similarly, incentivizing sustainability objectives within incentive systems can be a strategic move for companies aiming to foster a truly inclusive environment for women.

Recognizing the potential for future exploration, it is imperative to address the inherent limitations in this study, as they influence both the theoretical and practical implications of our findings. A primary limitation revolves around the scope of our sample, prompting questions about the generalizability of our results to the broader global landscape of companies. To bolster the robustness of our conclusions, future research should broaden its horizons by incorporating data from additional nations and regions worldwide. Exploring companies in diverse developed economies, such as Japan, South Korea, and Australia, would yield a more comprehensive understanding of the nuanced dynamics at play.

A second limitation arises from the decision to exclusively focus on listed companies. While this choice was driven by the need for a comprehensive sample in our analyses, it prompts contemplation about whether the relationship between the critical mass of women on boards and the appointment of a woman CEO holds true across different types of companies, including non-listed entities. Subsequent research, facilitated by data availability, could delve into this aspect, uncovering whether this correlation transcends the listing status of a company.

Furthermore, a constraint in our empirical method is the inability to directly analyze the underlying behavior of women directors. This limitation is a common challenge in board studies due to the notorious difficulty in obtaining original board data. To enhance the depth and

reliability of insights, future research, particularly qualitative in nature, could illuminate micro-behavioral mechanisms within the boardroom. Qualitative investigations can unveil specific dynamics, offering a more nuanced understanding of the interactions and decision-making processes among women directors.

In charting the course for future research, an intriguing direction lies in dissecting the impact of context-level differences. A focused exploration into the dynamics within women-dominated industries, for example, could yield valuable insights into how the critical mass of women on boards shapes the appointment of a woman CEO within specific organizational contexts.

Furthermore, we urge scholars to transcend the confines of critical mass theory and embrace a diverse array of theoretical frameworks, moving beyond traditional sociological and management paradigms. This expanded theoretical approach holds the promise of enriching our understanding of the entire phenomenon, contributing to a more holistic comprehension of the intricate interplay between women on boards and the selection of women CEOs. By incorporating varied theoretical perspectives, future research has the potential to unveil new dimensions, enabling a more nuanced exploration of the complex dynamics at the intersection of gender, governance, and leadership.

Our research not only highlights the positive influence of a critical mass of women on the board on the selection of a woman CEO but also emphasizes the pivotal role of sustainability governance in amplifying this effect. Specifically, our findings reveal that the presence of a sustainability committee within the board serves as a potent catalyst, further increasing the likelihood of appointing a woman as CEO. Furthermore, our results demonstrate that sustainability-linked incentive systems also act as influential catalysts. Overall, the synergistic interplay of gender diversity and sustainability initiatives within the governance framework emerges as a crucial driver for fostering inclusive leadership, offering valuable insights for organizations aiming to create more equitable and sustainable corporate environments.

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Appendix

| N. | Variable | Source | Description |
|----|----------------------------------|-----------|--|
| 1 | Woman CEO | Bloomberg | Binary variable that takes the value “1” if the individual is a woman and “0” if the individual is a man |
| 2 | Critical Mass WOB | Bloomberg | Binary variable that takes the value “1” if there are at least three women in the board of directors and “0” otherwise |
| 3 | Sustainability Committee | Bloomberg | Binary variable that takes the value “1” if there is a sustainability committee within the board and “0” otherwise |
| 4 | Sustainability-linked incentives | Bloomberg | Binary variable that takes the value “1” if there are sustainability targets within the incentive system and “0” otherwise |
| 5 | Firm size | Bloomberg | Natural logarithm of total assets |
| 6 | Firm performance | Bloomberg | Return on assets; Return on equity; Return on investment |
| 7 | Firm leverage | Bloomberg | Ratio between debt capital and equity capital |
| 8 | Growth opportunities | Bloomberg | Ratio between market value and book value of equity |
| 9 | Board size | Bloomberg | Number of directors present in the board of directors |
| 10 | Board independence | Bloomberg | Percentage of independent directors out of the total number of directors present in the board |
| 11 | Ownership structure | Bloomberg | Variable that takes the value “1” based on the identity of the majority shareholder |
| 12 | Year | Bloomberg | Variable that takes the value “1” based on the year to which the collected data refer |
| 13 | Country | Bloomberg | Variable that takes the value “1” based on the country to which the collected data refer |
| 14 | Industry | Bloomberg | Variable that takes the value “1” based on the industry to which the company belongs |
| 15 | Binding gender quota | Bloomberg | Binary variable that takes the value “1” if there is a binding gender quota in force in the country where the company operates, with consideration to the current year |

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Sinergie Italian Journal of Management

Useful information for readers and authors

Aims and scope

What is the positioning of Sinergie Italian Journal of Management?

Sinergie Italian Journal of Management, the official journal of the Società Italiana di Management (SIMA-the Italian Society of Management), is a peer-reviewed scholarly publication that presents leading research across all business and management areas and focuses on the main trends and boundary-pushing ideas in management studies.

What is this journal's topic coverage?

The journal has a broad thematic profile and covers various areas in the business and management field, such as strategic management, corporate governance, entrepreneurship, international business, sustainability, small and family business, operations and supply chains, strategic communication, marketing, retailing and service management, innovation and technology management, tourism and culture management and, of course, business ethics and general management.

What is "Italian" in Sinergie Italian Journal of Management?

This journal aims both to bring the Italian management perspective to the international debate and to encourage scholars worldwide to contribute through an innovative approach on topics relevant to the sound conduct of businesses and other organisations. The journal's keywords include, but are not limited to, management applications specially relevant to the Italian economy and other mature economies, such as manufacturing, creativity, sustainability, open innovation, digital transformation, entrepreneurship in small and medium-sized enterprises, family business, networks, alliances and territorial ecosystems, innovative value proposals and circular business models, as well as to the management of specific businesses, such as food, fashion, furniture, industrial equipment, art, culture, tourism, design and luxury.

How broad is the scope of this journal?

Sinergie Italian Journal of Management aims to balance relevance with methodological rigour and encourages interpretation, reasoning and critical, context-aware discussion about phenomena and their managerial implications. Narrow discussions focussed only on highly specific sub-fields will be regarded as non-priority.

Which research approach does this journal welcome?

The journal is open to different research approaches and welcomes both conceptual and empirical contributions that employ a qualitative, quantitative or mixed methods research approach. It also accepts case

studies, provided the analysis is adequate. Review articles that move beyond description to propose critical reflection and sound theoretical contributions are also welcome.

Issues frequency and coverage

When is the journal published during the year and are special issues part of the editorial planning?

The journal is published every quarter. It welcomes both the submission of manuscripts to be published in its regular issues and of manuscripts to be published in special issues edited by guest editors. Special thematic issues have always been a prominent feature of Sinergie Italian Journal of Management. Currently, the Editors are encouraging the development of special issues on relevant management themes that fit the journal's scope.

Principles and vision

What principles drive the conduct of this journal?

A few fundamental principles drive the conduct of Sinergie Italian Journal of Management:

- **Relevance:** The journal values the usefulness of research to improving management practice and to addressing business challenges and socially relevant issues.
- **Originality:** The journal encourages creativity, curiosity and interdisciplinary contamination in an effort to develop fresh, sometimes out-of-the-box, ways of conceptualising management-related phenomena.
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- **Respect:** The journal promotes constructive, respectful dialogue among authors, staff and readers and recognises the dignity of individuals and the validity of their opinions.

What vision has inspired the development of this journal?

Connections between research, ethics, creative thinking and managerial action are the foundational premises on which to build a future based on the common good.

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The peer-review process can lead to:

- acceptance of the paper as it is
- acceptance with minor proposals for improvements
- acceptance subject to substantial modifications
- revise and resubmit
- rejection.

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PORTER. M. (1985), *The competitive advantage: creating and sustaining superior performance*, Free Press, New York.

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Book chapters

PHILLIPS R., BARNEY J., FREEMAN R., HARRISON J. (2019), “Stakeholder Theory”, in Harrison J., Barney J., Freeman R., Phillips R. (edited by), *The Cambridge Handbook of Stakeholder Theory*, Cambridge University Press, Cambridge.

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 - purpose of the paper
 - methodology
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 - originality of the paper.
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20 copies printed by

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