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Leaders, let's get agile! Observing agile leadership in successful digital transformation projects

Riccardo Rialti [a,*], Raffaele Filieri [b]

[a] Department of Management & Corporate Law, University of Siena, Piazza San Francesco 7, 53100, Siena, Italy
[b] Department of Marketing, Audencia Business School, Route de la Jonelière, 8, 44312, Nantes, France

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Abstract Digital transformation is imperative for companies wishing to remain competitive. Undeniably, the integration of digital technologies has proven fundamental for enhancing business performance. Despite this, little is known about how leadership styles influence the outcome of digital transformation processes. To address this gap, this study builds on the practice-based view (PBV) to explore how managers can lead these transformative processes. We interviewed 19 managers and employees from an Italian company, LEM Industries, to gather relevant insights about the phenomenon. The findings show how agile leaders drive successful digital transformation through fast decision loops, continuous participation in digital transformation activities, and evolutionary and revolutionary practices, making the organization leaner and more efficient. Agile leadership deployment made employees feel part of the broader decision-making process. Such a change increased their overall morale, as they began to feel part of the future of the company. Thus, agile leadership is an appropriate approach to engaging organizational members in digital transformation projects.

1. Get digital or go bust!

Digital transformation has been defined as an organization-wide unitarian development aiming to adopt digital technologies to improve processes for all stakeholders (Feliciano-Cestero et al., 2023; Gong & Ribiere, 2021). Contemporary businesses

* Corresponding author
E-mail addresses: riccardo.rialti@unisi.it (R. Rialti), raffaele.filieri@audencia.com (R. Filieri)

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need to transform to remain competitive after the Fourth Industrial Revolution (Marrucci et al., 2022; Secundo et al., 2021). In 2022, companies worldwide spent about US $1.6 trillion on digital transformation. This sum is set to reach $3.5 trillion by 2026 (Statista, 2023a), and about 90% of companies in developed countries have started a process of digital transformation (Dal Mas et al., 2023). Northern European countries—Denmark, Sweden, and Finland—and the United States show the highest figures in terms of digital transformation initiatives (European Commission, 2022), while India, China, and several Southeast Asian countries have shown the greatest year-on-year increase in digital technology adoption (Statista, 2022a).

Currently, most companies' financial efforts in digital transformation go into material procurement (Statista, 2022b). Software for analyzing big data empowered by artificial intelligence (AI), hardware for computers, servers, and wiring, and advanced production machines for 3D printers, robotics, Internet of Things (IoT) devices, and automatic machines still represent the lion's share of investments (Frank et al., 2019). Worldwide surveys show that about 85% of executives wish to match material expenditures with the workforce (Statista, 2023b), implying a pivotal role of employees in digital transformation projects (Rialti et al., 2019).

Digital transformation is a multifaceted phenomenon that radically affects the way operations are run through disruptive technological solutions (Tekic & Koroteev, 2019) while contemporarily creating "the need for organizations to update the skills of their workforce to remain successful" (Ostmeier & Strobel, 2022, p. 718). The transformation must then involve and affect any individual at any level of the organization, from the lowest to the highest ranking.

The effects of digital transformation projects may vary. Improvements in operational efficiency, innovation capabilities, reduced product lead time, greater profitability, and general increases in competitiveness are the main outcomes (Fragapane et al., 2022; Raguseo et al., 2021). Likewise, a company completing a successful transformation may increase its consumer-centrism by adopting new instruments to collect consumers' data and developing new communication strategies (Del Vecchio et al., 2018; Hu et al., 2023).

While great investments and efforts are undertaken by companies, about 50% of digital transformation projects fail to deliver any result (Davenport & Westerman, 2018; Reuschl et al., 2022). These situations arise as managers must balance the human factor against adopting new technologies (Tabrizi et al., 2019). While technology adoption is fundamental, the contributions of human employees are what permit organizations to function as an unbroken system (AlNuaimi et al., 2022). Vial (2019) stated that transformation managers should strive to develop both an organization-wide digital attitude and a digitally oriented culture to address the disruption posed by digital transformation (Fernandez-Vidal et al., 2022).

Leaders of digital transformation must craft a vision capable of motivating employees to embrace change, must define the path to be followed by everyone involved, and must create the conditions that foster technological acceptance (Tabrizi et al., 2019). Leaders are the agents who detect the change occurring in the environment and who push the business to adapt accordingly (Swift & Lange, 2018). They can set an example among all employees with respect to technology adoption (Guinan et al., 2019; Secundo et al., 2022).

Even so, our knowledge of the role of leaders in digital transformation projects is still limited and is mainly based on reports or professional literature (Hansen et al., 2011; Smaje & Zemmel, 2022). Specifically, there is little research on the leadership styles that are most suitable to driving digital transformation. Understanding the specific actions leaders must take to ensure a smooth transformation is equally important.

To address these literature gaps, this study explores the role of an emergent leadership style, agile leadership (Rigby et al., 2018), in digital transformation projects. Agile leadership is based on the 12 principles of agile project management (Denning, 2016): Agile leaders support the company through fast decisions during any of the diverse phases of digital transformation while simultaneously providing feedback to team members and employees about possible improvements. Agile leadership differs from traditional leadership styles in ensuring complete participation in technical solutions across the organization. This leadership style may prospectively fit within the broader context of leadership styles suitable for digital transformation (i.e., digital leadership; Secundo et al., 2022). Thus, we attempt to answer the following research question:

- RQ: How does agile leadership contribute to digital transformation?

To answer this research question, this study has adopted an interpretive approach that relies on

inductive reasoning to generate a theoretical understanding of the research phenomenon from the participants' perspectives (Walsham, 1995). LEM Industries provides the case study chosen for this purpose. The study explores the role of leadership in digital transformation through the theoretical lens of the practice-based view (PBV). PBV, indeed, is a suitable approach to investigate how some commonly existing practices may combine to generate new methods adept at triggering emerging competitive advantages (Bromiley & Rau, 2014).

2. Foundations of digital transformation

Digital transformation is both an exogenous and endogenous phenomenon. The exogenous trait concerns how companies draw external inputs to digitalize and pursue a competitive advantage (Porfírio et al., 2021). The endogenous one concerns how companies successfully integrate into their organizational structure innovations, like digital technologies, to reap new opportunities (Frank et al., 2019). The more radical the transformation faced, the more any involved individual must collaborate to achieve a commonly defined outcome, and the whole company must accelerate to keep pace with change (Ostmeier & Strobel, 2022). Digital transformation is also a multilevel organizational revolution that requires managers to identify the right technological needs and, ultimately, to foster employees' adoption (Porfírio et al., 2021). Consistent with the interpretation of companies as sociotechnical, open systems, successful digital transformation results from fitting the new technologies both to the organization's external environment and to its internal needs (Chowdhury et al., 2022).

Unsurprisingly, the digital transformation literature explored the topic according to these two perspectives. On the one hand, it proved necessary to understand digital transformation building on systems' openness, which allows relevant technologies to permeate the organizational borders and to generate competitive effects (Hinterhuber, 2022). On the other hand, it was observed how the internal side (i.e., the human side) reacted to the arrival of new technologies (Elia et al., 2017).

The first stream of research on digital transformation explored the core technologies potentially driving digital transformation, such as AI, machine learning, big data, cloud computing, the IoT, and social media, as well as these technologies' impacts on companies' performance (Markus & Rowe, 2023). This literature focused on how technologies digitalize existing components of a company, enable their connection to the internet, and transform instruments into data sources that can be used for optimization (Marrucci et al., 2023).

As digital transformation is related to organizational change, the academic literature also focused on internal procedures, seeking to explain why some businesses are more effective than others in digital transformation initiatives (Fernandez-Vidal et al., 2022). Liu et al. (2011) pointed out the importance of the fit between existing internal resources and newly adopted technologies. The availability of such resources as outstanding technical assets, financial power, and IT knowledge may ease the integration of new technologies within the company (Elia et al., 2021). Warner and Wäger (2019) observed how companies characterized by organization-wide dynamic capabilities are more prone to accomplish digital transformation. For example, identification, interpretation, adaptation, and IT reconfiguration capabilities may generate flexibility and ambidexterity that can support the transformation (Magistretti et al., 2021; Neirotti & Raguseo, 2017). A similar vision has also emerged from research stressing how specific technology-related employees' skills may be pivotal drivers of change (Ostmeier & Strobel, 2022). In this vein, AlNuaimi et al. (2022, p. 637) explained that to be successful in digital transformation, companies must integrate "novel actors, structures, practices, values, arrangements, and beliefs".

But organizational change must be coordinated, and it is up to leaders to ensure harmony. Just as leaders identify the need for the business to change, they should also identify which existing skills and capabilities should be nurtured to maintain employees' engagement and commitment (Margherita & Heikkilä, 2021). In this regard, it is fundamental to identify which approach to leadership is the most suitable to pursue these complex objectives altogether.

3. The evolution of leadership styles

The ensemble of leaders and senior executive directors (i.e., the C-suite) are the people entrusted by shareholders to assess the business environment in all its complexity and to guide the company into the future (Jackson & Dunn-Jensen, 2021). Leaders should be proficient at running the company in

peaceful times (i.e., at ensuring the minimum organic growth of the firm), while at the same time, they should be capable of making it adapt amid difficulties and change (e.g., transformation to face competitive pressures). Leaders bridge the gap between external change and internal players by communicating the need for change to ensure company survival (Atwater et al., 2008).

Choosing the right leadership style can improve workforce satisfaction, performance, and engagement (Warrick, 1981). Leaders determine rewards and punishments to reinforce good practices and to discourage bad ones, thus shaping employees' attitudes and commitment to their jobs (Plachy & Smunt, 2022). Supportive, encouraging, and behaviorally consistent leaders may encourage the development of employees' self-identities (Jackson & Johnson, 2012). On the contrary, overly critical leaders acting inconsistently contribute to rising stress levels among employees, creating an environment characterized by fear, tension, and low commitment (Guinan et al., 2019; Porfírio et al., 2021).

The full-range leadership (FRL) model pairs different leadership styles with various challenges companies may face (Warrick, 1981). According to the FRL model, leadership styles may be organized according to leaders' time commitments and in terms of their engagement in their duties. The three main categories included laissez-faire, transactional, and transformational leadership.

1. Laissez-faire leadership is characterized by low effort and lack of engagement. Leaders embracing laissez-faire deny their leadership responsibilities, leaving collaborators to act as they prefer without specific control (Podsakoff et al., 1990). While this style creates relaxed environments, it also leads to minimal coordination and drives employees to pursue their own interests. This leadership style is therefore unsuited to driving organizational change processes such as digital transformation.

2. Transactional leadership requires modest efforts and average engagement. This leadership style is based on exchanges between employees and leaders. Leaders ask employees for performance, and the latter receive a conditional reward for their efforts. This style of leadership is frequently associated with management by exception, as employees consult their leaders only for negotiations and to address discrepancies between objectives and outcomes (Blake et al., 1962). In relation to its characteristics, this style is frequently used for the management of organic growth or to preserve existing performance.

3. Transformational leadership requires lots of time, effort, and engagement in managing collaborators. A transformational leader builds leadership through interpersonal relationships and tries to align their goals and those of the workforce with those of the company (Warrick, 1981). Such leaders pour huge efforts into motivating everyone involved in the company. But transformational leadership is frequently associated with disenchantment. As anxiety may arise in employees who are incapable of following the leader (McCarthy et al., 2021).

Other researchers have defined still other leadership styles (Anderson & Sun, 2017). For example, autocratic, democratic, human-relationship, authentic, servant, and ethical leadership styles have been proposed in the management literature (Guinan et al., 2019; Porfírio et al., 2021). These styles, in short, range from the high engagement and efforts of democratic and servant leadership to the opposite autocratic styles. Ethical, authentic, and human-relationship leadership represent variations built on leaders' guiding values requiring high engagement and effort. Anderson and Sun (2017) discussed how these leadership styles sometimes overlap.

Emerging from research on transformational leadership and digital technologies, the notion of digital leadership has been proposed (AlNuaimi et al., 2022). Digital leadership has been conceptualized as a style merging leaders' technological capabilities—such as following technological trends, determining the direction of digital change, and addressing the team about changes that need to be undertaken—with the traits of trust-building and self-sacrifice found in transformational leaders (AlNuaimi et al., 2021). Digital leaders observe the digital transformation from a high vantage point and can thus provide directions to everyone else, adjusting to feedback as it is received (Chatterjee et al., 2023). But this leadership style can succeed only for leaders technologically skilled enough to set the course and steer accordingly (Tabrizi et al., 2019). Even so, the concept of digital leadership has frequently been used to describe leadership styles suitable for digital transformation rather than as a unitarian leadership style (AlNuaimi et al., 2021).

Nonetheless, the technological competencies of leaders and of the workforce may vary. For example, a company may have a technologically skilled workforce but not skilled enough leaders,

or vice versa (Swift & Lange, 2018). When this occurs, leaders may risk losing sight of how value-creation activities can be affected by digital transformation (Smaje & Zemmel, 2022). Similarly, the workforce may grow frustrated should the leader fail to grasp technical issues (Jackson & Dunn-Jensen, 2021; McCarthy et al., 2021).

For these reasons, leaders must motivate the workforce by aligning individual and organizational goals, and they must be hands-on with the project and actively seek to increase their skills over time through mutual interactions (Rialti et al., 2019). In such a way, a leader may grasp the nature of problems as they arise, increase their digital skills, and disseminate wisdom about digital transformation (Hansen et al., 2011). Hence, contemporary leaders must overcome traditional leadership styles—including digital leadership—by embracing new approaches rooted in direct, continuous, and personal involvement to avoid detachment from other individuals engaged in transformation processes.

4. Agile leadership and digital transformation

Agile originated in 2001 as an approach for software development project management (Bianchi et al., 2020). The foundations of agile leadership are (a) partitioning the work into small teams, (b) network orientation toward partners, and (c) customer-centrism (Denning, 2016). Agile leadership has seen successful application across different contexts owing to its ability to achieve rapid, customer-oriented, and digitally driven product development or organizational transformation through internal engagement (Bianchi et al., 2022). Agile is related either to design thinking or lean approaches. It complements design thinking in solutions' development and realization phases while simultaneously building on lean ideology about team-based collaboration, organization-wide learning, and measuring results immediately. The Agile Manifesto includes 12 basic principles and four core values for any manager wishing to implement this methodology in their organizations; it explains how to achieve customer-centrism and to deliver innovative outcomes through internal collaboration (see Table 1; Adobe, 2022). To apply agile leadership, the project team needs to follow decision loops called sprints involving design, build, test and review phases. Everyone involved in the team discusses possible improvements to the outcomes in any loop phase.

Over time, the agile approach became relevant for companies managing complex digital transformation projects. Particularly, researchers observed how adopting agile in these contexts generates several benefits, such as flexibility, improved communication and team engagement, frequent delivery of outputs, emphasis on value-creation activities, and focus on continuous improvements of existing solutions (Zhu et al., 2021).

According to Rigby et al. (2018), in the wake of the diffusion of agile teams in different industries, leaders should also strive to become agile. Agile teams work through collaboration using short chains of command. Likewise, the deployment of agile principles requires the involvement of anyone from the team in the project activities, the creation of interpersonal trust necessary to work autonomously, top-down empowerment regarding autonomous decisions on strategic priorities, and group discussion about the outcomes achieved before the handover of the project. Leaders should then behave consistently (Denning, 2016), as agile team members prefer leaders who are flexible in terms of change, who allow everyone to enhance their skills, and who inspire learning (Younger, 2016). Agile leaders surpass the traditional transformational leadership style by adopting the 12 principles to drive agile teams toward greater organizational purposes (see Table 1).

In a divergence from transformational leaders, agile leaders do not take credit for their success but share it among the team members (Chen et al., 2022). Delegation is fundamental, yet agile leaders should be ready to assume the burden of failure (Rigby et al., 2018). Agile leaders stay focused on what is relevant for customers and consistently attempt to generate additional value for the organization (Fachrunnisa et al., 2020). To do so, flexibility in project execution is fundamental, as new information may arise from the environment, and new features may be added to the project according to emerging needs.

Agile leaders do not focus simply on aligning organizational and employees' goals but also collaborate hands-on in digital transformation projects (Denning, 2016). They merge external foresight and internal management (Rigby et al., 2018) and they are the real agents of change in digital transformation projects (see Table 2, Agile Business Consortium, 2022). Agile leaders initiate the transformation, and they voluntarily participate in the project, invite members to suggest solutions to problems, and focus on making employees more aware of the company and on helping them to learn new practices on their own (Tabrizi et al., 2019). By following these guidelines and staying close to the action, agile leaders can

Table 1. Linking agile principles to leadership behaviors

Agile value	N°	Original agile project management principle	Leadership behavior in digital transformation associated with agile principle (In Italics, traits shared with Transformational Leadership)	Internal or external ambit	Application scope
External-internal collaboration must be the focus of the project (collaboration is more important than negotiation)	**1**	Satisfy consumers and stakeholders through early and continuous delivery	**Think about consumers' and stakeholders' satisfaction with the development and implementation of a new process**	External	Increasing consumer and stakeholder satisfaction
Internal collaborators are more important than the simple adoption of processes and tools	**2**	Welcome changing requirements even late in the project	**Be open-minded with respect to technological additions to the project**	Mixed: originate externally, cause internal effects	Adaptability, Agility and Strategic Flexibility
	3	Add value frequently	**Focus on any increment in the project which may foster value creation**	Mixed: originate internally, cause external effects	Value creation
	4	Facilitate communication between project stakeholders	**Create channels to improve the communication between internal actors and external stakeholders**	Mixed: link internal and external sides	Communication and engagement
	5	Build project to motivate individuals	**Identify internal change leaders (champions)**	Internal	Internal engagement
	6	The most effective communication channel is face-to-face	**Change the mindset to foster internal dialogue, and be direct in the delegation of tasks**	Internal	Internal engagement
Innovative working applications are more important than the most technologically advanced ones	**7**	Useful project results are the most important measure of progress	**Focus on each stage (stack) before authorizing project advancements**	Internal	Value creation
Responding to change is more important than following the initial plan	**8**	Maintain a sustainable pace at work	**Involve the workforce in scheduling decisions to be sure they can express their concerns about deadlines.**	Internal	Internal management
	9	Continuous excellence reinforces agility	**Create an environment focused on excellence, which may generate agility through the development of new capabilities.**	Internal	Adaptability, agility, and strategic flexibility
	10	Simplicity is essential	**Technological applications showing immediate functionality are the most suitable according to current skill levels**	Mixed: originate internally, cause external effects	Value creation
	11	Self-managed teams generate the most value	**Delegation is fundamental**	Internal	Internal management
	12	Regularly adapt ways of working to become more effective	**Remain flexible in project execution**	Internal	Adaptability, agility, and strategic flexibility

avoid problems typical of transformational—and digital—leadership styles, such as detachment and frustration in the workforce.

Agile values and best practices affect how agile leaders make their decisions (Jackson & Dunn-Jensen, 2021; McCarthy et al., 2021). Building on agile loops (i.e., sprints), agile leaders make decisions by initiating the project, evaluating the possible alternative, planning for the future, acting on the internal side by inviting team members to suggest solutions, reviewing and integrating these solutions with suggestions, and, finally, deploying them while ensuring the development of new capabilities in the team and the organization (See Figure 1).

The above decision-making loop is a peculiarity of agile leadership, which makes this style particularly appropriate in the evaluation of digital transformations. Through adopting this mindset, agile leaders can constantly refine their original attitude toward the digital transformation process by integrating internal and external feedback (Parker et al., 2015). The openness of the decision-making loop also allows leaders to rely on collaborative deliberation, which is fundamental for creating a sense of shared ownership with respect to digital transformation and thus too in driving organization-wide acceptance of change (Hayward, 2021).

5. Agile leadership at LEM industries

This study adopts a case-study approach to investigating how agile leaders drive digital transformation. The case-study method is well suited to providing a deeper understanding of emergent phenomena (Martini et al., 2014), which, in this case, revolves around exploring agile leadership's contributions to the successful digital transformation of a company through the deployment of new organizational practices.

LEM Industries is a company based in Italy; it employs about 600 people and specializes in surface treatments (e.g., galvanic, physical vapor deposition, cataphoretic, and regular varnishing) for metallic garments for fashion, luxury, and furniture. The main strategic objective of the company for the next 5 years concerns the completion of a multistep digital transformation process that started in 2017. Shareholders wish the company to fully digitalize any activity at LEM Industries in the shortest possible time. To achieve this result, several actions related to agile have been undertaken.

This case has been selected for various reasons. One reason is that Italy represents fertile ground for the study of digital transformation. The Industria 4.0 law provides consistent tax breaks to companies pursuing digital transformation projects. To exploit these benefits, companies need to provide detailed and precise documentation explaining which technologies will be affected and how training activities will be performed. In addition, LEM Industries went through a leadership training program to introduce managers to the agile mindset. As of today, most of the leaders within the company are assessed as following agile principles, at least in some basic form (LEM Industries, 2022). Hence, the case selection allowed us to observe in the field the effects of agile leadership during a digital transformation project.

5.1. Methodological notes and data analysis

We deemed 19 semistructured interviews (see Table 3) sufficient for reaching theoretical saturation, as no new relevant insights emerged after the 15th interview (Walsham, 1995). The interviews provided the informant with a starting point in the discussion on a certain topic and then allowed them to move freely as they liked (Hu et al., 2023). Insights were then checked against additional data sources to ensure their validity (Rialti et al., 2018; Zollo et al., 2022). We interviewed both leaders and employees because leadership is multifaceted; it is executed by leaders but reverberates for employees, so we felt the need to observe both sides.

One of the authors systematically kept a research diary with notes about emerging information. Interviews were transcribed, generating about 80 pages of data, which were manually analyzed. We identified six main themes—agile leadership's evolutionary and revolutionary practices, lean thinking, agile organization, diffused collaboration, emergence and exploitation of new technological skills—and 10 codes concerning how agile leadership influences digital transformation. Additional information about these themes and codes is shown in Figure 2.

5.2. A practice-based interpretation of agile leadership and digital transformation

This study aimed to observe how agile leadership influences digital transformation by identifying which practices, both of agile leaders and among the company's employees, foster a smoother, more rapid acceptance of the change. The PBV was considered the principal theoretical lens (Russo-Spena & Mele, 2012) of this study. PBV

Table 2. Agile leader's core values, characteristics, and best practices

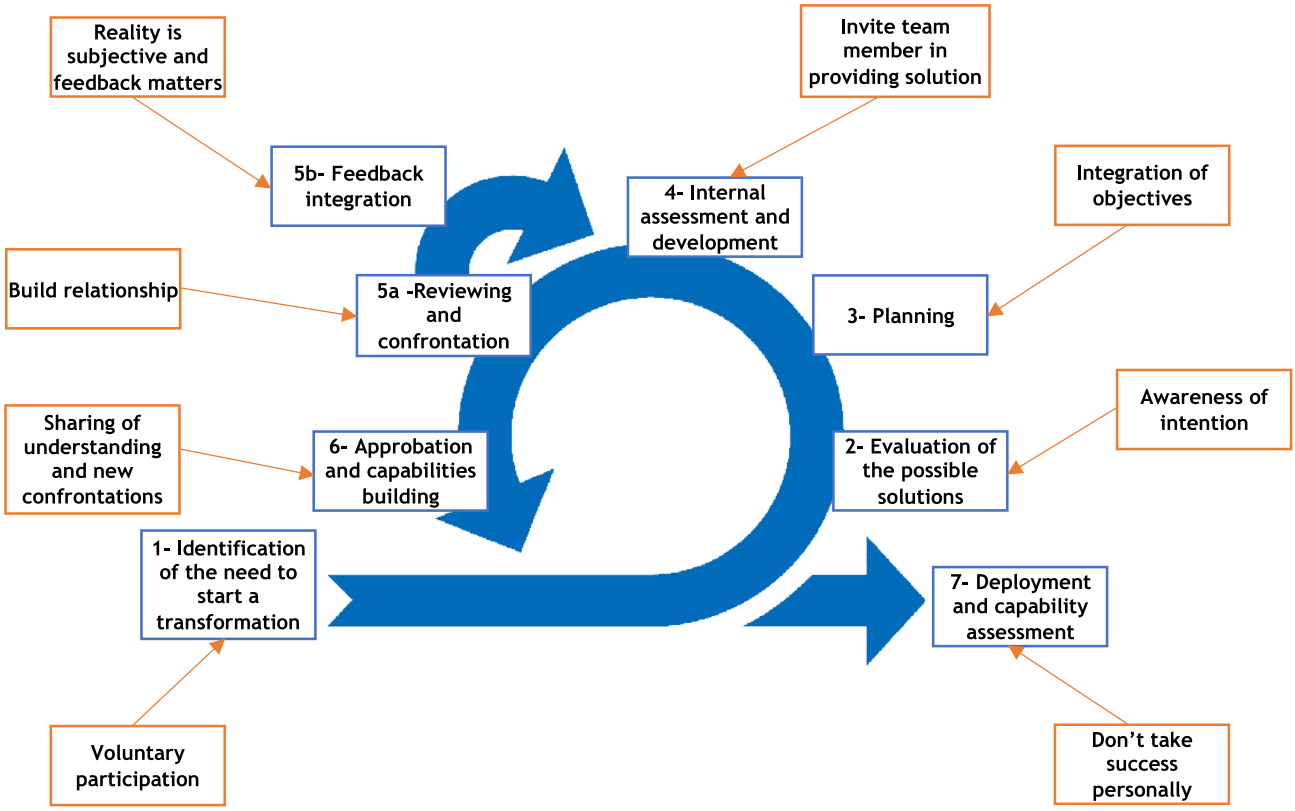
Core values of agile leaders	Characteristics	Agile leaders' best practices
Engagement Agile leaders are inclusive and collaborative	Collaborative	Voluntary participation in the project
	Feedback-oriented	Share understanding
		Build relationships
Direction Agile leaders are communicative and empowering, aligning their goals with organizational ones.	Visionary	Integrate their personal objectives with the organization's
Innovation Agile leaders are curious and experimental	Facilitator	Invites members to deliver outcomes rather than expects them to
Integrity Agile leaders are self-aware and accountable	Coach	Considers reality as subjective and is willing to explore beyond the first recommended solution
	Motivator	Does not take success or failure personally
Urgency Agile leaders are focused and decisive	Purposeful	Aware of intentions
	Change-oriented	Does not follow predetermined assumptions

holds that the success of a company can be deduced through the consideration of practices—that is, a set of imitable and widely diffused activities that are commonly executed by businesses—and how they combine to generate organizational effects such as increased competitive advantage (Bromiley & Rau, 2014). The theory then explains how a principal input influences the reassembly of existing practices into new implementable evolutionary or revolutionary ones capable of changing how the business operates (Bromiley & Rau, 2014). The theory is likewise suitable for understanding through qualitative approaches the role of upper echelons in influencing the behaviors of the collaborators and for drawing meaningful insights in the form of actionable frameworks for businesses to follow (Malacina et al., 2022).

Building on this view, interviewees from the LEM Industries first indicated several evolutionary practices. As an example, leaders' behaviors in the C-suite changed after the deployment of the agile approach. Conversations with leaders and senior directors showed how they started to behave as peers, reducing formalization in their interactions. This occurrence improved willingness to promote the start of a new project within the company, even to the point of forming spin-offs (Marrucci et al., 2022). A constructive and supportive environment arose in the C-suite, as people came to consider one other more as peers than as potential competitors. Hence, constructive insights were gleaned even from cases of failure (Rigby et al., 2018). The increase in entrepreneurial spirit, first within the C-suite and then at the company level, is one effect of this new approach to internal relationships.

The informal approach adopted within the C-suite soon extended to the relationship between leaders and the workforce. Employees especially enjoyed being able to informally approach leaders to express individual concerns. Interviewees stressed how their involvement in the decision-making processes and planning, particularly when their suggestions were included in the project (Denning, 2016), was fundamental to increasing their engagement with the company. Employees appreciated most of all discussing strategy with leaders and learning new approaches to their own work (AlNuaimi et al., 2021). Such involvement increased employees' overall morale at work, as they started to feel part of the developments occurring in the company. The diffusion and implementation of simple, evolutionary practices by leaders, such as eagerness to discuss projects with employees, openness to confrontation on equal footing, and direct support and coaching for employees facing technology-driven difficulties, then emerged as cornerstones in the build-up to greater change.

Figure 1. Agile leaders digital transformation loop



- Blue boxes show the phases that agile leaders must follow to successfully deploy a digital transformation.
- Orange boxes indicate which best practice is enacted during the succession of phases.

Henceforth, leaders could also push everybody to learn or develop new value-creation and cost-management practices originally prerogative of only the C-suite or senior managers. The diffusion of new evolutionary practices was fundamental to making employees keener to accept revolutionary ones and thus to their assuming greater responsibilities. Employees, for instance, became aware of the need for the company to increase profits through individual actions aimed at saving money, reducing inefficiencies, and improving operational effectiveness. So they observed their leaders working on the project, which allowed them to learn new technology-management skills (Rialti et al., 2020). Leaders with elevated technological skills explained to employees the usefulness of new technologies, showed them the benefits of technologies for work, and instructed everyone in correct usage. This approach made the workforce capable of thinking autonomously regarding the new technologies (Secundo et al., 2022). As an example, some of the interviewees in the production plants started to grasp the benefits of collaborative robotics as they first understood the potential of robots in reducing physical burden. In another case, marketing staff understood the potential of big data for tracing customers' activities and so were able to plan ways to extract additional information. Finally, a junior supply-chain manager suggested adopting blockchain protocols to ensure products' traceability, an initiative LEM Industries later adopted. By the end, most employees could make basic forecasts about future initiatives and could suggest new paths to leaders to improve production processes or product quality (Bianchi et al., 2022).

Through the implementation of both evolutionary and revolutionary practices, the company created a collaborative environment in which everyone tried their best to augment the skills of their peers, including new technological competencies (AlNuaimi et al., 2022). For example, practices concerned with cost management and individual value creation promoted a lean environment in which everyone contributed to the continuous improvement of processes and products. Rapid adaptation practices—which govern how employees sense the environment and adapt their workflows to it—increased the company's overall agility. Under these new practices, about eight out of 10 of the company's

Table 3. Case study information sources and interviews

Primary data sources used for investigation	Collected October 2022—December 2022		
	Semistructured interviews **Starting interview protocol:** 1a) Describe your relationship with other members of the C-suite (asked of leaders) 1b) Describe your relationship with your direct leaders (asked of employees) 2) Describe the actions enacted to change the relationship between leaders and subordinates 3) Describe the motivation underlying the need to change the previous practice 4) How are you managing the digital transformation through these new actions? 5) What are the main relational outcomes obtained? 6) What is the main practical output obtained by this kind of action? 7) Do you approve of employees and leaders working together? 8) How much feedback is taken into consideration? 9) In which ways has the company changed its functioning?		
	Informant	**Number of interviews**	**Hours**
	CEO	**1**	**1.5**
	CIO	**1**	**2**
	CDO	**1**	**2**
	General director	**2 (2 interviews with general director)**	**4**
	Senior project manager	**2 (2 interviews with the same senior project manager)**	**3**
	Employees	**12 (12 interviews with 12 employees and department heads)**	**14**
		19 (with 17 individuals)	**26.5 hours (across different plants)**
	-Balance sheet **-Internal reports** **-Company website**		
Secondary data sources used for triangulation	Consulted November 2022 — January 2023		
	-Industrial association reports **-Newspaper article on the company** **-Digital consultants' reports** **-Previous research on the company**		

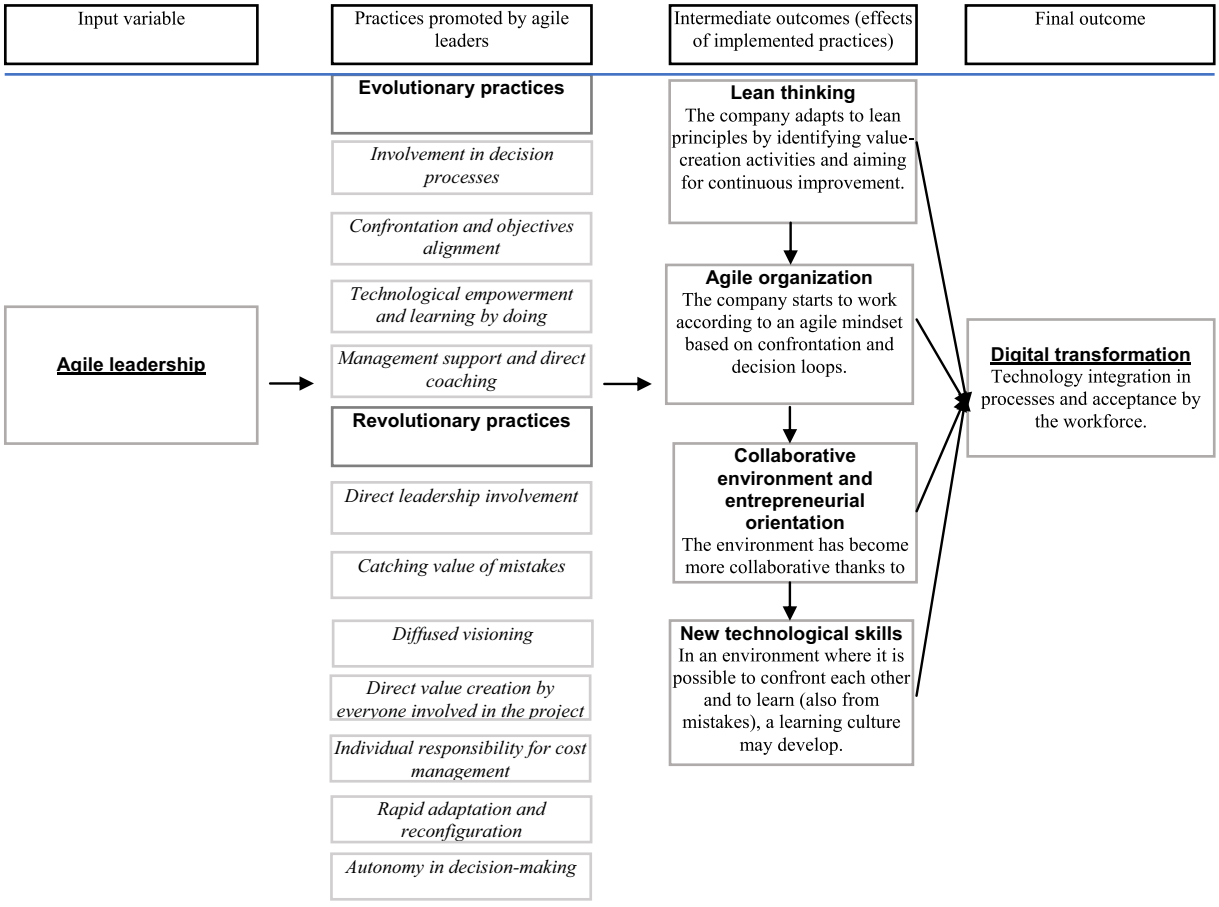
digital transformation projects met basic expectations, while one out of 10 outperformed expected objectives. These projects ended with the integration of digital technologies in the company, acceptance by the workforce, improved work conditions, and better organizational climate. Another relevant outcome was the empowerment of new staff who started to manage technology-related problems autonomously. Many of these eventually became managers for new digital transformation projects thanks to their experiences and new skillsets (Ostmeier & Strobel, 2022). Figure 2 summarizes the results of the investigation.

6. Theoretical implications and guidelines for future agile leaders

This study explored the role of agile leadership practices in ensuring a successful digital transformation (Secundo et al., 2021, 2022). To the best of our knowledge, it represents one of the first attempts to analyze the pivotal role agile leadership plays in the development of new procedures (Rigby et al., 2018).

The findings contribute to the literature on agile leadership by providing the first comprehensive definition of its characteristics, which to date had mostly been discussed in a fragmented fashion

Figure 2. A practice-based view of the importance of agile leadership for digital transformation success



*Titles in bold correspond to the six main topics identified in the review of the transcripts.
**Contents in italics roughly correspond to the principal core codes emerging from the review of the interview transcripts.

(Chen et al., 2022; Ostmeier & Strobel, 2022; Tabrizi et al., 2019). The agile leadership style was consistently identified as requiring high effort and engagement while emphasizing agile values and principles as well as employees' empowerment (McCarthy et al., 2021). The findings show that agile leadership differs from traditional transformational and digital leadership in its ability to prevent employee frustration and disenchantment regarding digital transformation (AlNuaimi et al., 2022). Agile leaders participate in their projects, and the feedback loops ensured by agile principles allow mutual participation, thus avoiding employee disengagement (AlNuaimi et al., 2022; Jackson & Dunn-Jensen, 2021). Moreover, hands-on participation and informal interactions between the C-suite or between managers and employees allow agile leadership practices to diffuse organically within the organization (Fernandez-Vidal et al., 2022; Magistretti et al., 2021). Mutual and peer-based learning enable leaders and employees alike to enhance their competence (Elia et al., 2017; McCarthy et al., 2021). Agile leadership thus emerges as the best leadership style when facing digital transformation.

This research also enhances the literature on digital transformation by observing which capabilities could be relevant for these projects. Interpersonal skills and knowledge exchanges are fundamental in digital transformation projects (Rialti et al., 2019). Collaborative environments are, accordingly, the most suitable ones to perform transformations (Hansen et al., 2011). Employees are the ones who, in the end, will have their jobs and daily routines affected by digital transformation (Vial, 2019). Listening to their suggestions will prove fundamental for any business aiming to digitalize itself (Neirotti & Raguseo, 2017).

From a practical perspective, leaders wishing to embrace agile leadership must remember that they need to change themselves before starting a digital transformation project (Davenport & Westerman, 2018; Podsakoff et al., 1990). Agile leadership requires being cooperative and willing to listen to employees' needs.

Here are some guidelines for leaders wishing to succeed in agile leadership:

- *Become expert in the agile approach*. Indeed, leaders will find it impossible to practice agile principles without first knowing the basics of agile or understanding agile-based thinking (Denning, 2016).

- *Learn peer-learning methodologies*. Leaders then have to become suited to peer-learning methodologies, which will allow them to train employees while listening to their concerns and suggestions (Younger, 2016). Being informal is accordingly not a sufficient condition; leaders must also be ready to take employee suggestions seriously.

- *Engage in practical activities related to digital transformation*. Leaders must swallow their pride and focus on engaging themselves in digital transformation project activities, even the most menial or annoying ones (Plachy & Smunt, 2022).

- *Map the existing practices and identify agile ones that need to be diffused*. Finally, leaders will have to map the organization's extant practices and evaluate which ones will be retained under the new, agile approach, which ones will need to be improved, and which ones will have to be replaced altogether (Bianchi et al., 2022).

Even with these guidelines, leaders must keep in mind that the starting phases of digital transformation must follow a top-down approach (Tekic & Koroteev, 2019). Leaders themselves must be the ones keeping tabs on the environment and proposing needed changes (Hansen et al., 2011). Then, through compromise with the workforce and the development of a shared vision thanks to feedback, leaders can implement a bottom-up process of strategic assessment, which could lead to (1) fewer mistakes, (2) more coherent planning, (3) a more skilled workforce, (4) greater engagement in digital transformation practices, and (5) renewed involvement in company life (Porfírio et al., 2021). To reap these benefits, leaders should start thinking of their company in a systemic way, so that each individual represents a part of a well-oiled machine, and dissatisfaction on the part of anyone may stop a process from working (Markus & Rowe, 2023). Such an approach will also encourage them to think of themselves as the ones oiling the machine, maintaining its function as they scan the environment while charting the company's course (Elia et al., 2021).

From this point, more research on agile leadership is needed. Our research is qualitative and explorative in nature, yet future research could use quantitative approaches to test the framework emerging from this study. Likewise, consideration of more case studies may yield additional insights.

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