Implementation of Management 3.0: its consistency and conditional factors

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Abstract

Purpose – Rapid changes in the business environment and the accelerating dynamics and increasing complexity shaping the functioning of organizations have given rise to modern concepts of people management. The Management 3.0 (M3.0) concept was developed based on agile project management concept; however, it can be implemented not only in projects, but also in the entire organization. It consists of six pillars such as: energizing people, empowering teams, aligning constraints, developing competencies, growing structure, and improving everything. The paper aims to present the relationships between the level of implementation of the above-presented pillars and such variables as the scope of use of agile project management methodologies, and project managers' (PMs) as well as HR practitioners' knowledge in this area.
Design/methodology/approach – Members of PMI and IPMA representing 34 companies located in Poland took part in the research which was based on a CAWI method.
Findings – Research shows that the level of M3.0 implementation – in terms of its six pillars – is internally consistent but mostly on a "defined" level. No correlation was observed between the implementation of M3.0 and the frequency with which agile project management methodology is applied. On the other hand, there is a strong correlation between the level of PMs' knowledge and the implementation of some of the M3.0 pillars. HR specialists' knowledge in the field of M3.0 is not associated with organizational advances in the implementation of M3.0.
Originality/value – As the first research project in the area of M3.0, this study proposes practical implications as well as topics which require further empirical exploration.

Keywords Human resource management, HRM, Agile, Leadership, Project-oriented organization
Paper type Research paper

Introduction

Today, change is the one constant in our lives, including in the case of the business environment. Both professional managers and theorists are focusing more and more of their attention on the increasing dynamics and compldexity of organizations. Nowadays, organizations operate in highly competitive markets (Král and Králová, 2016). Other changes include technological disruptions (the fourth industrial revolution) (Cimini *et al.*, 2021), globalization (Marković, 2008), the destruction of the natural environment (Winn *et al.*,

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2011), as well as political, social and other emergencies (van Fenema and Romme, 2020). Companies must be able to continuously reorganize themselves so as to respond promptly and properly to a challenging new business reality. To ensure the successful implementation of innovations they must shape appropriate organizational structures and working conditions in order to support people's creativity (Gaspary *et al.*, 2020).

It is widely believed that agile management helps companies build and maintain their competitive advantage by enabling them to respond and adapt immediately to a changing environment as well as through the introduction of flexible organizational models based on shared leadership which stimulate innovation (de Borba *et al.*, 2019; Gaspary *et al.*, 2020).

Agility can be defined as "the ability of an organization to sense or create environmental change and respond efficiently and effectively to that change" (Gartner, 2006) (p. 1). Agile methodologies have been transforming the way in which organizations manage projects for the past several decades (Rigby *et al.*, 2016). Agile management stems from agile project management and is related to the general management of an organization. However, applying agile practices in an organization as a whole is a more recent and broader concept (Gunsberg *et al.*, 2018).

As Appelbaum *et al.* (2017) states "the commitment to continuous transformation and agile strategies implies changes at all levels of the organization from its structure, through its leadership and decision-making dynamics, down to the skills and interpersonal relationships of the individuals implementing the agile mission" (p. 69). Agility requires a radical change in the way organizations are managed (Hesselberg, 2018) and – in particular – in the way people are managed.

An approach based on treating employees as the most valuable element of any organization is reflected in the development of many modern concepts of people management (e.g. human capital management (Diaz-Fernandez *et al.*, 2017), socially-responsible human resources management (Barrena-Martinez *et al.*, 2019), sustainable human resources management (Ehnert, 2009; Piwowar-Sulej, 2021a)) and leadership theories (Mango, 2018).

Management 3.0 (M3.0) was developed by Appelo (2011) on the basis of the concept of agile project management and can be implemented not only in projects, but also in an entire organization. This concept comprises six pillars: (1) energizing people, (2) empowering teams, (3) aligning constraints, (4) developing competence, (5) growing structure, and (6) improving everything. Moreover, many practical tools have been created to help organizations act in accordance with these pillars.

Although many studies have been devoted to the problem of agile project management and organizational agility (Dingsøyr *et al.*, 2012), the M3.0 concept has not been broadly examined either theoretically or empirically. The thesis can be formulated that effective implementation of agile management requires effective implementation of M3.0. This fact justifies conducting research on the implementation of M3.0 as well as on the factors affecting this implementation. The problem has not been discussed or empirically examined before.

The present paper addresses this very issue. It makes use of both studies from the subject literature and empirical research on the implementation of the concept in companies located in Poland. In particular, it analyzes the internal consistency of the implementation of M3.0 and examines the correlation between the level of M3.0 implementation on the one hand, and the scope of application of agile project management methodologies as well as the competencies of project managers (PMs') and HR specialists in M3.0 on the other.

The article contributes to the theory in a number of ways. Firstly, the authors answer the basic academic questions of "what and how" (Whetten, 1989) in order to fully implement the concept of M3.0. Secondly, the author presents the link between the conceptual framework and the results of original empirical research. Thirdly, the authors set out the directions for further research.

The study is organized as follows. The second section of the article presents the theoretical background and hypotheses. The concept of M3.0 is described after taking into account such concepts as Management 1.0 (M1.0) and Management 2.0 (M2.0), and its six pillars. Since M3.0 stems from agile-project management, the links between agile-project management and M3.0 is also discussed. Then the competencies of PMs and HR departments are shown to be important factors upon which the implementation of M3.0 depends. The third section describes the research methodology, while the results and a discussion are presented in the fourth section. The final section of the article provides conclusions and presents the practical and theoretical implications.

Literature background and hypotheses

From Management 1.0 to Management 3.0 concept

M3.0 is the successor of M1.0 and M2.0. M1.0 is associated with the school of classical management. Officially it dates to the early years of the 20th century, when Taylor published his first article on the foundations of management knowledge (Taylor, 1911). The other leading authors of classical management theories were Ford and Fayol. Their ideas arose from analyzing the work process. They focused attention on improving the organization of human labor in a single workplace as well as on the work of small teams and the ways of managing them. The main impulse behind these theories was the desire to maximize labor productivity. They also envisaged close monitoring of the work performed by employees, a vertical company structure, centralized management, rewarding only productivity, as well as the fact that each employee could be easily replaced by another (such as machines). Moreover, they stated that employees and their supervisors have inherently conflicting interests, which causes animosity between these groups (Haig and Hoxie, 1916).

The M1.0 concept was developed by engineers and was fairly successful in the early 20th century. Guided by hard data, engineers tried to plan work in such a way as to maximize the efficiency of workers. Workers were also meant to feel that they were being constantly monitored. However, workers began to revolt against these imposed methods, which often required them to work to the limits of their strength and endurance. In the 1930 and 1940s, the popularity of M1.0 declined. This was due, among other things, to the development of the academic discipline of psychology, which challenged Taylor's thesis that workers are naturally disengaged, lazy, and can only work when given specific instructions on what their work should look like. In the 1920s Mayo – a representative of the behavioral management school – decided to investigate what motivates employees to work better and more efficiently. He noticed that while economic factors still play an important role in employee engagement, how they are treated in their work also matters (Mayo, 1933).

M2.0, on the other hand, involves a shift away from leaders exerting strict control of employees towards a greater emphasis on trust and treating people as the most valuable element of a company. Moreover, managers should adopt the perspective. of "servant leaders" and embrace a situational leadership style. This concept evolved from works authored by Goldsmith (Hesselbein *et al.*, 1996), Blanchard (Blanchard and O'Connor, 1997), Kaplan and Norton (1996) and utilizes such management tools as 360-degree feedback and balanced scorecards.

One of the interesting practices arising from M2.0 was the introduction of one-to-one conversations with employees (Blanchard and Johnson, 2001; Blanchard *et al.*, 1985). This could be treated as a new approach to work in an organization. Management was now expected to take notice of employees. The management team was to help employees identify their strengths and improve their skills. However, despite what the theory promised managers, instead of managing the work environment – as was the case with M1.0 – often adopted a micromanagement approach by directly assigning tasks to employees. Often, including during face-to-face conversations, managers set goals for their employees, and then

employees had to report their progress in achieving these goals to their superiors. This reinforced the superior-subordinate relationship and resembled the direct management of employees rather than help in supporting their development.

The suggestion that managers organize 360-degree feedback sessions (Hesselbein *et al.*, 1996) is also quite reasonable. The problem is that managers are not independent observers. They cannot objectively evaluate the performance of an individual, and as a consequence evaluations should be made from multiple perspectives. Unfortunately, some people do not realize that the method they use to evaluate results will have an effect on those results. That is why HR departments install electronic performance evaluation tools through which people anonymously evaluate each other. Trust completely breaks down as managers may know more about employees than employees themselves, which also highlights the inequality that exists between managers and employees in a hierarchy.

There is also nothing wrong with the idea of balanced scorecards (Kaplan and Norton, 1996). The problem with such measurements is that one metric easily leads to sub-optimization (improving one aspect of work while downgrading another). As a consequence, multiple perspectives are needed to ensure a more holistic view of an organization's performance. Unfortunately, when managers still see organizations in hierarchal terms, they tend to try and impose goals and metrics on each part of the system. However, in complex systems, performance tends to be based on the relationships between the parts.

M2.0 is also associated with a new model of leadership called situational leadership developed by Hersey *et al.* (1979). They believed that a leader should build his or her authority among employees independently, and not through a company's rigid hierarchy. In turn, Greenleaf (2007) developed a concept of servant leadership whose natural role is to serve people. This period also saw the emergence of such management concepts as total quality management and lean management as well as such HRM concepts as human capital management (HCM) and high-performance work systems (HPWSs). The HCM concept focuses on the development and utilization of talented employees, and reporting the performance and assessment of intangible assets for decision-making purposes (Baron and Armstrong, 2007). HPWSs can be defined as "a specific combination of HR practices, work organization and processes, which allows for maximization of the competence of employees and their commitment" (Snell and Bohlander, 2004) (p. 890). It has been empirically proven that the implementation of the latter concept results in harm to employees (Mariappanadar and Kramar, 2014).

Appelo (2011) argues that although M2.0 organizations are at least trying to do the right thing they do some of these things the wrong way because they still maintain a hierarchical view of organizations. The positive ideas underlying the servant and situational styles of leadership, as well as the concepts of total quality management, constraint theory, and many other management models could be discussed. All of them have undoubtedly helped organizations move away from M1.0. However, often the orders still come from senior management and other people who often do not have enough knowledge to be able to make decisions due to the hierarchical structure of an organization. Managers accept good ideas but force them to fit bad architecture. This is primarily the reason why good ideas rarely persist and will always be replaced one by one. The only consistently achieved effect of all the ideas implemented by bosses is strengthening the boss's position (Piwowar-Sulej, 2020).

As was described in the Introduction, the concept of M3.0 is derived from agile project management. In short, it can be said that according to the principles of M3.0 a manager should provide adequate support for the team in which he or she works. Leaders do not have to be the best and the smartest in the technical fields in which they work, but they must be able to support people working in their team and improve the team (McPherson, 2016).

The most important aspect of M3.0 is the promotion of interaction between people and allowing them to improve the system. This concept is not a working methodology. It is a framework that presents a set of exercises and techniques that team leaders can choose when

experimenting to see what works best for their organization. Moreover, it summarizes previous findings about the critical elements of the agility paradigm. For example, Crocitto and Youssef (2003) stated that interpersonal, cross-functional and organization-spanning relationships are critical elements of agile organization. In turn, Joiner and Josephs (2007) emphasized the role of the leader in shaping energy dynamics in the workplace.

M3.0 comprises the following six pillars (Appelo, 2011):

Pillar 1: Energizing/motivating people – stimulating people to act, in accordance with the view that without them there is no organization, and the role of the manager, in this case, is to keep employees engaged and highly motivated,

Pillar 2: Empowering employees – power in the hands of the team, i.e. allowing teams to act and provide them with a sense of safety, which promotes proactive attitudes among employees and allows them to create self-organizing teams,

Pillar 3: Aligning constraints – matching constraints, i.e. setting a well-defined goal, defining a course of action and supporting teams in achieving that goal. It is believed that all employees are responsible for managing a company, and not only those in managerial positions. Attention is paid to the fact that the goals are set jointly by the entire team because an agile leader can cope without knowing the detail, can quickly get to grips with complex issues and ask the right questions (McPherson, 2016).

Pillar 4: Developing competencies – developing competencies, encouraging employees to provide help, support, and mutually develop skills as well as expand their competences on their own,

Pillar 5: Expanding the structure – expanding a scalable structure, creating a friendly work environment, establishing clear rules and communication between teams, ensuring the superiority of a network structure over a hierarchical one, because one of the features of a network is collective intelligence (Sutton *et al.*, 2014).

Pillar 6: Improving what is possible (ongoing improvement of products, services or processes).

Each pillar is equally as important as the others. The concept of M3.0 assumes that most things can be learned by trying. Hence, it is important to encourage employees to experiment and treat possible failures as valuable lessons for the future and opportunities for development. At this point it is worth noting that research carried out by Yang and Liu (2012) confirmed that a network structure has a positive impact on a company's performance.

Some of the above presented pillars seem to offer nothing new. For example, management science has developed many theories of employee motivation (Jones and Page, 1987); however, M3.0 focuses on intrinsic motivation. Kanter (1977) discussed the idea of empowerment in 1977 emphasizing decentralization and flattening of the hierarchy. The author believed that access to empowerment structures depends on the degree of formal (job description) and informal (relations) power an individual possesses in an organization. In M3.0 the focus is on informal power.

According to the literature, effective implementation of different management concepts is based on consistency between a concept and company strategy as well as on the internal consistency of the concept. Internal consistency is achieved when the construction of one component is in line with the construction of another (Nadler and Tushman, 1980). Building consistent systems of policies and practices is complicated, especially in the area of managing people (García-Carbonell *et al.*, 2018). Taking this fact into account the question arises of whether there are any differences in the level of implementation of the above six M 3.0 pillars.

H1. There is a significant difference between the level of implementation of Management 3.0 and the levels of implementation of its six pillars, which means that the implementation of Management 3.0 is not internally consistent).

The use of agile-project management and advances in Management 3.0

Several project methods have been developed over the years. They serve as guides to the types of documentation and authority necessary to implement particular stages of a project. They provide a tried and tested framework for inexperienced PMs, which can assist them in project completion and also support organizations in adjusting project management procedures and terminology. Undisputedly, they exert an impact on the organization of work and how team members are addressed in a project.

There are two approaches in the literature to project management: traditional (managerial) and modern (agile, adaptive, dynamic, light). The former goes back to the 1950s, whereas the latter was developed in the 1990s. The traditional methodological approach describes the essential processes and offers a systematically arranged collection of well-established management techniques. In addition, it embraces the view that each consecutive project stage cannot be initiated if the previous one has not been entirely completed, including with regard to the respective documentation. Such an attitude, however, is no longer sufficient, e.g. in the case of software development projects (Berger and Beynon-Davies, 2009). This gap has been filled by the Agile approach, in accordance with which required solutions are developed in tandem with any problems that occur (Piwowar-Sulej, 2021b).

The main idea behind agility and the values of agile project management can be found in The Agile Manifesto (Agilemanifesto.org, 2020). Agile's founders emphasize the value of people, running software instead of extensive documentation, working with clients on contract negotiations and responding to changes resulting from a plan. Implementing these key values should guarantee proper interaction between the developer and the client (involving the latter in the design and development stages; help respond to changes effectively) and – as result – deliver convenient working software and provide customer satisfaction (Al-Ratrout, 2019). This approach has led customers to appreciate improvements in many aspects, such as a reduction in software development costs and faster product delivery (Highsmith, 2002).

Over time, the values presented in The Agile Manifesto were not limited to software engineering. More than twenty different agile methodologies have been developed (Rasnacis and Berzisa, 2017). Agile methods are gaining in popularity and are currently used regardless of a company's size or the sector in which an organization operates, because all companies have to deal with a changing business environment (Dingsøyr *et al.*, 2012; Nagaria *et al.*, 2019; Gerster *et al.*, 2020). They can also be seen as instruments for promoting innovation and thus organizational development and growth (Nazir *et al.*, 2020).

The process of disseminating agile ideas, regardless of the scale of an organization, emphasizes the importance of treating an organization as an agile complex system and, consequently, requires investigating the factors that favor and limit effective implementation of agile thinking in a business as a whole. An agility-driven (or agile) organization has the "ability to continuously adjust and adapt strategic direction in core activities, as a function of strategic ambitions and changing circumstances and create not just new products and services but also new business models and innovative ways to create value in complex and fast-changing conditions" (Holbeche, 2015). Yang and Liu (2012) claim that flexibility in assembling resources, knowledge, processes, and capabilities is reflected in a company's agility.

Research shows that the transition away from individual agile project management towards real business agility is difficult to achieve. There are many factors that affect this transition such as costs, schedules, culture, leadership competencies, organizational proactivity vs. reactivity, personal characteristics and employee motivation (Chow and Cao, 2008;

Leybourne, 2009; Rasnacis and Berzisa, 2017; Fossum *et al.*, 2019; Podgórska and Pichlak, 2019). As was presented in the Introduction, the origins of M3.0 lie in agile project management and the goal of M3.0 is above all to help ensure success in agile project management. Thus, we arrive at the following hypothesis:

H2. A significant relationship exists between the level of implementation of Management 3.0 (in terms of its six pillars) and the frequency of the application of agile project management methodologies.

Competencies of project managers and HR professionals as factors influencing the implementation of Management 3.0

Because people are a critical factor for both individual organizational activities and overall organizational performance, employee competencies, behaviors and attitudes have been the subject of numerous studies (Salman *et al.*, 2020; Yaşar *et al.*, 2013).

The results of many research projects highlight the importance of the competencies of PMs for a project's success (Aurélio de Oliveira *et al.*, 2012; Grzesik and Piwowar-Sulej, 2018; Podgórska and Pichlak, 2019; Alvarenga *et al.*, 2019). In addition, when it comes to comprehensive project management practices, organizations often have to deal with possible tensions within the organization that, as a result, can affect the efficient performance of a project (Lappi *et al.*, 2018). Agile transformation requires more than the adoption of new copybook practices. It also necessitates a change in behaviors, norms and mindset across the organization (Gregory and Taylor, 2019).

As Appelo (2011) contends, to ensure effective implementation of agile management at the organizational level it is not only PMs who should follow the principles of M3.0. However, since the origins of M3.0 are associated with agile project management the following hypothesis can be formulated:

H3. A significant relationship exists between the level of implementation of Management 3.0 (in terms of its six pillars) and the level of project managers' knowledge in this area.

As was indicated in the Introduction, the concept of M3.0 should be applied throughout an entire organization. The management board should promote this concept and be its primary ambassador. Effective implementation of changes in corporate culture and employee behavior also requires active support from the HR department. Nowadays, a general shift is taking place in the role performed by the latter, away from strictly administrative functions, to a more developmental approach, and even embracing the role of a business partner. This evolution is conditioned by numerous changes in a company's environment, which in turn gives rise to new needs from the various recipients of HR specialists' services (Piwowar-Sulej, 2017). The most advanced role of a modern HR department is that of a business partner. This role requires continuous learning within different fields of knowledge which are necessary for organizational development and promoting change (influencing decisions made by senior managers) (McCracken *et al.*, 2017). The above leads to the final hypothesis:

H4. A significant relationship exists between the level of implementation of Management 3.0 (in terms of its six pillars) and the level of an HR department's awareness of this concept.

Research methodology

This study was designed to be conducted directly – using the PAPI (paper and pencil interview) method at conferences organized by two project management chapters functioning in Poland: the Project Management Institute and the International Project Management Association. Unfortunately, the COVID-19 pandemic made this approach impossible and thus an on-line survey method was conducted in the fourth quarter of 2020 instead. A link to the questionnaire

was sent to major representatives of the above-mentioned project management chapters with a request that they share the link with other members of the chapters. Participants were informed that the research topic was M3.0, and that participation was voluntary.

Multiple scale items were used in this study. To examine the level of M3.0 implementation maturity levels were established on the basis of the Capability Maturity Model Integration (CMMI) approach. This model includes the following levels: "initial" (unpredictable processes), "managed" (processes are repetitive but not formalized), "defined" (processes are formalized but not measured), "quantitatively managed" (processes are formalized and measured) and "optimizing" (processes still undergoing improvement) (Tarhan *et al.*, 2015). These levels were applied to particular pillars of M3.0.

When asked what percentage of projects in an organization are managed using agile project management methodologies, respondents could choose between the following options: 0, 1–25, 26–50, 51–75, 76–99 and 100%.

There is no single specific scale in the available literature for measuring employees' competencies (Salman *et al.*, 2020). The levels of PM and HR department knowledge in the area of M3.0 were determined using the following scale: 1 – a lack of knowledge, 2 – basic/low level of knowledge (basic awareness of the analyzed concept and certain tools used within this concept), 3 – novice level (learning in practice as well as learning through training in the analyzed concept), 4 – intermediate/improvement level (there is a need to improve some practices based on consultancy with an external expert), 5 – a good/advanced level of knowledge (there is a high ability to use the knowledge and skills related to M3.0), 6 – expert level (there is an ability improve upon previously learned techniques and the potential to train others in this concept) (The National Institute of Health, 2021).

Only 34 valid questionnaires were collected. The three most represented groups of respondents were as follows: PMs ($n = 10$), line managers ($n = 6$) and scrum masters ($n = 4$). The three most represented industries were: ICT ($n = 14$), research and development ($n = 5$) and manufacturing ($n = 4$). The respondents worked mainly in large (251–500 employees) and very large (more than 500 employees) enterprises ($n = 15$ and $n = 11$, respectively). Small and medium-sized enterprises and medium-sized enterprises were represented by an equal number of respondents ($n = 4$).

The statistical analyses required the use of different methods. In the first stage, the implementation of different levels based on repeated measurements was compared using the Friedman test. In the next stages (from 2 to 4), the pillar levels in three or more groups were compared using the Kruskal–Wallis test. After detecting statistically significant differences, post-hoc analysis using Dunn's test was performed to identify different groups in terms that were statistically significant. These methods were chosen because the pillar level assessments lacked normal distribution by definition (they were numbers in the range of 1–5). For analytical purposes a significance level of 0.05 was adopted. Thus, all p values below 0.05 were interpreted as showing statistically significant relationships. The analyses were performed with *R* software, version 4.0.5 (R Core Team, 2021).

Results and discussion

In the first stage of the analysis, we examined variations in the implementation of M3.0 from the perspective of the level of implementation of its six pillars. The results are presented in Table 1.

Table 1. Descriptive statistics regarding the levels of implementation of different M3.0 pillars

Level	Pillar 1	Pillar 2	Pillar 3	Pillar 4	Pillar 5	Pillar 6	p
mean ± SD	2.85 ± 1.44	2.68 ± 1.22	2.5 ± 1.08	2.85 ± 1.31	2.65 ± 1.35	2.68 ± 1.39	$p = 0.619$
median	3	2	2	3	3	2	
quartiles	2–4	2–3	2–3	2–4	1.25–3.75	2–4	

Note(s): * statistically significant relationship ($p < 0.05$), p – Friedman's test

The level of implementation of M3.0 varies depending on the particular pillars. However, these differences are not significant. As a consequence, the results make it possible to reject H1 and confirm the internal consistency of policies and practices regarding M3.0, which is for the most part important in fostering an appropriate work culture (Becker and Huselid, 2006). In this case, however, the second and the third level represent an average level of implementation in the case of individual M3.0 pillars, which means that the processes related to these pillars are at most defined (formalized but not measured). A shift towards higher M3.0 implementation levels is required because – as is emphasized in the theoretical part of this paper – it should contribute not only to a project's success but also to the organization's growth (Nazir *et al.*, 2020). Advances in technology and the pace of innovation, as well as increased customer expectations regarding non-standard products are resulting in rapid changes in the business environment, and this requires the agile approach (Olak, 2017). In turn, successful implementation of agile is based on a pro-innovation culture, empowerment, vision, strategic direction, change management, communication, ambiguity tolerance, market analysis and response, operational management, structural liquidity, and the development of a learning organization (Harraf *et al.*, 2015).

On the other hand, it is also assumed that an agile organization is responsive to social issues (Yusuf *et al.*, 1999). Taking this fact into account it can be stated that one possible reason for the low level of M3.0 implementation in the surveyed organizations is that employees do not feel a need to be included in decision-making processes. Another is that they fear change. Literature studies confirm that agile implementation is a comprehensive process and requires a great deal of effort on the part of an organization, as well as an ability to overcome resistance to change (Boehm and Turner, 2005; Dyba and Dingsoyr, 2009).

In the second stage of the analyses, we examined the extent to which a significant correlation exists between the level of implementation of M3.0 (in terms of the six pillars) and the frequency with which agile project management methodologies are applied in an organization. The results are presented in Table 2.

Level of implementation of M3.0 pillars		Share of agile-managed projects in the organizations 0–25% ($N = 11$)	26–50% ($N = 4$)	51–75% ($N = 9$)	76–100% ($N = 10$)	p
Pillar 1	mean ± SD	2.27 ± 1.62	2.25 ± 0.96	3.56 ± 1.33	3.1 ± 1.29	$p = 0.164$
	median	2	2.5	4	3	
	quartiles	1–3	1.75–3	3–4	2.25–3.75	
Pillar 2	mean ± SD	2.82 ± 1.33	2.5 ± 0.58	2.56 ± 1.33	2.7 ± 1.34	$p = 0.978$
	median	2	2.5	2	2	
	quartiles	2–3.5	2–3	2–3	2–3	
Pillar 3	mean ± SD	2.73 ± 1.1	2 ± 0.82	2.67 ± 1	2.3 ± 1.25	$p = 0.534$
	median	3	2	3	2	
	quartiles	2–3	1.75–2.25	2–3	1.25–3	
Pillar 4	mean ± SD	2.55 ± 1.29	3 ± 0.82	3 ± 1.41	3 ± 1.49	$p = 0.84$
	median	3	3	3	3	
	quartiles	1.5–3	2.75–3.25	2–4	2–4	
Pillar 5	mean ± SD	2.27 ± 1.19	2 ± 1.15	3.22 ± 1.56	2.8 ± 1.32	$p = 0.386$
	median	2	2	3	3	
	quartiles	1–3	1–3	2–5	2–3.75	
Pillar 6	mean ± SD	2.18 ± 1.47	2.75 ± 0.96	3.11 ± 1.36	2.8 ± 1.48	$p = 0.39$
	median	2	2.5	3	2.5	
	quartiles	1–3	2–3.25	2–4	2–3.75	

Note(s): *statistically significant relationship ($p < 0.05$), p - Kruskal–Wallis test

Table 2. Results of the Kruskal–Wallis test regarding the relationship between the share of agile-managed projects in organizations and organizational progress made in M3.0

The above research shows that the level of M3.0 implementation (in terms of its six pillars) is not strongly associated with the frequency of application of agile project management methodologies in an organization. This result is surprising because M3.0 has its origins in agile project management. This may prove that, despite the growing popularity of agile project management, people are still being managed both in projects and in organizations as a whole in a traditional, formal and prescriptive manner. As was indicated above, such a practice constitutes a barrier not only to effective project management but also to the development of the organization as a whole.

In the third stage of the analyses, the level of M3.0 implementation (in terms of its six pillars) was measured in relation to the level of PMs' knowledge in this area. An improvement in the level of such knowledge was observed in only two companies, while in another two such knowledge was at a good level. These high scores were noted in companies that had reached the "learning" level. The results of applying the Kruskal–Wallis test and post-hoc analysis (Dunn's test) are presented in Table 3.

These results partially confirm H3, namely that a strong correlation exists between the level of M3.0 implementation and the level of PMs' knowledge in this area. The results show that PMs' competencies are associated with the effective implementation of Pillar 1 (energizing/motivating people), Pillar 4 (developing competencies) and Pillar 5 (growing the structure). The implementation of these pillars was significantly higher when the level of PMs' knowledge was at the learning level and, where their knowledge was either good or had improved. These findings highlight the role of PMs in one of the most important factors for agile project management implementation, namely employee motivation (Ribeiro and Domingues, 2018). Moreover, PMs' knowledge of M3.0 is reflected in personnel development which is crucial for the purpose of improving performance and implementing changes (Werner and DeSimone, 2012). PMs' knowledge is also associated with monitoring team boundaries because people cannot identify with a team if their membership of that team is unclear (Appelo, 2014).

Level of implementation of M3.0 pillars		Project managers' level of knowledge: Lack of knowledge–A ($N = 8$)	Basic level of knowledge–B ($N = 14$)	Level of learning, improvement or good–C ($N = 12$)	p
Pillar 1	mean ± SD	2.75 ± 1.67	2.07 ± 1	3.83 ± 1.19	$p = 0.008$*
	median	3	2	4	
	quartiles	1–4	1–3	3–5	C > B
Pillar 2	mean ± SD	2.75 ± 1.16	2.36 ± 1.22	3 ± 1.28	$p = 0.207$
	median	2	2	3	
	quartiles	2–3.25	2–2	2.75–3.25	
Pillar 3	mean ± SD	2.12 ± 1.36	2.29 ± 0.99	3 ± 0.85	$p = 0.066$
	median	2	2	3	
	quartiles	1–2.25	2–3	2.75–3	
Pillar 4	mean ± SD	2.62 ± 1.19	2.21 ± 1.05	3.75 ± 1.22	$p = 0.01$*
	median	2.5	2	4	
	quartiles	2–3	1.25–3	3–5	C > B
Pillar 5	mean ± SD	2.25 ± 1.58	2.14 ± 1.17	3.5 ± 1	$p = 0.017$*
	median	1.5	2	3.5	
	quartiles	1–3.25	1–3	3–4	C > A,B
Pillar 6	mean ± SD	2.62 ± 1.3	2.14 ± 0.95	3.33 ± 1.67	$p = 0.162$
	median	2	2	4	
	quartiles	2–3.25	1.25–3	1.75–5	

Table 3.
Results of statistical analyses in terms of the link between project managers' knowledge of M3.0 and organizational progress made in M3.0

Note(s): *statistically significant relationship ($p < 0.05$), p - Kruskal–Wallis test + post-hoc analysis (Dunn's test)

In the final stage, the level of M3.0 implementation (in its six pillars) was examined from the perspective of the level of HR awareness in this area. The results of this analysis are presented in Table 4.

It is commonly assumed in the literature that the HR department plays an important role in an organization (Ramlall and Melton, 2018). This role requires continuous learning in various areas necessary to develop the organization and induce changes(influencing the decisions made by senior managers). However, the results of current research do not confirm the hypothesis that a significant correlation exists between the level of M3.0 implementation (in its six pillars) and the level of an HR department's M3.0 awareness (H4). As Table 4 shows, no statistically significant correlation exists between the knowledge possessed by HR staff and the implementation of particular M3.0 pillars.

The above analysis may suggest a lack of cooperation between PMs and HR departments in the surveyed organizations. Although in 2017 Piwowar-Sulej (2017) recommended introducing the role of HR business partner in project-oriented organizations, the research results reveal the subordinate role played by HR departments. HR specialists are not seen as architects of change. At this point it should be emphasized that HRM research pays limited attention to projects as forms of temporary organization (Samimi and Sydow, 2021), which can be a barrier to change in the relationships between project management and HRM.

Conclusions, limitations and directions for future research

Agile implementation both in projects and in the organization as a whole must be preceded by a thorough assessment of the key factors conditioning management processes that directly or indirectly lead to the success of a project or organization (Cooke-Davies, 2002). One of these factors is the concept of management practiced in an organization. As was pointed out in this study, M3.0 is needed to ensure an organization is capable of effectively adapting to rapid changes.

Level of implementation of M3.0 pillars		Level of knowledge of the Management 3.0 concept among HR specialists: Lack of knowledge ($N = 11$)	Basic level of knowledge ($N = 10$)	Level of learning ($N = 6$)	Level of improvement or good ($N = 7$)	p
Pillar 1	mean ± SD	3.45 ± 1.44	2.3 ± 0.95	3.5 ± 1.64	2.14 ± 1.46	$p = 0.105$
	median	4	2	4	2	
	quartiles	3–4.5	2–3	2.5–4.75	1–2.5	
Pillar 2	mean ± SD	3 ± 1.18	2.7 ± 1.16	2.5 ± 1.38	2.29 ± 1.38	$p = 0.51$
	median	3	2.5	2	2	
	quartiles	2–3.5	2–3	2–2.75	1.5–2.5	
Pillar 3	mean ± SD	2.64 ± 1.29	2.1 ± 0.88	2.83 ± 1.47	2.57 ± 0.53	$p = 0.665$
	median	2	2	2.5	3	
	quartiles	2–3.5	1.25–3	2–3.75	2–3	
Pillar 4	mean ± SD	2.91 ± 1.14	2.5 ± 1.18	3.83 ± 1.17	2.43 ± 1.62	$p = 0.183$
	median	3	2.5	4	2	
	quartiles	2–3.5	2–3	3.25–4.75	1–3.5	
Pillar 5	mean ± SD	2.64 ± 1.36	2.2 ± 1.03	3.67 ± 1.51	2.43 ± 1.4	$p = 0.231$
	median	3	2	4	2	
	quartiles	1.5–3.5	1.25–3	3.25–4.75	1.5–3	
Pillar 6	mean ± SD	2.64 ± 1.29	2.5 ± 1.35	3.5 ± 1.22	2.29 ± 1.7	$p = 0.326$
	median	2	2	3	1	
	Quartiles	2–3.5	2–3.5	3–4.5	1–3.5	

Note(s): *statistically significant relationship ($p < 0.05$), p - Kruskal–Wallis test

Table 4. Results of the Kruskal–Wallis regarding the link between the level of knowledge of the M3.0 concept among HR specialists and organizational advancement in M3.0

This study revealed that in practice M3.0 implementation is internally consistent, although in most cases it remains at the "defined" level. This indicates that the studied organizations need to aim towards more advanced levels of M3.0. At this point it is worth stressing that the research presented in this study did not reveal a significant correlation between the level of M3.0 implementation (in terms of its six pillars) and the frequency of application of agile project management methodologies in an organization, even though M3.0 has its origins in agile project management. On the one hand, this can be justified by the incorrect implementation of agile project management in the studied organizations. On the other, it may provide evidence that M3.0 can be successfully implemented even if the prevailing model in an organization is traditional project management. Although traditional project management methodologies put the emphasis on ensuring complete documentation and a clear demarcation between project stages, project's success depends on the quality of relationships between the people involved in a project. The PM is the primary actor and "sculptor" of these relationships.

Moreover, this study extends the scope of earlier research on the role of PM competencies in a project's success (e.g. (Aurélio de Oliveira *et al.*, 2012; Grzesik and Piwowar-Sulej, 2018; Podgórska and Pichlak, 2019; Alvarenga *et al.*, 2019)) by highlighting the importance of PMs' competencies for ensuring the successful implementation of M3.0 in terms of motivating people, developing competencies and growing the structure. The measurement and development of PMs' knowledge of these M3.0 pillars needs special attention.

It was also shown that no significant relationship exists between the competences of HR specialists and the level of M3.0 implementation. This may prove that the role performed by HR departments in the organizations examined in this study does not correspond to the HR business partner role. Another reason for the underdeveloped role of HR departments in facilitating the transformation of organizations towards M3.0 may be that they – similarly to HR professionals in the USA – view successful organizational change as primarily occurring in a hierarchical manner and assign the responsibility for change to top, senior and middle managers (Baran *et al.*, 2019).

HR departments should be close to the need of business, which implies being "close to projects" (Piwowar-Sulej, 2017). Transforming the role of HR professionals and their progress in the field of M3.0 are not only key to a project's success but also to organizational growth. HR departments may help, e.g. in implementing an agile approach in an organization, among other things by: identifying an organization's readiness for change, identifying the practices to be adopted, identifying potential barriers to implementation and identifying organizational solutions for adopting the new approach (Sidky *et al.*, 2007).

HR departments are also responsible for providing project managers with knowledge about the most important areas of successful M3.0 implementation (motivating people, developing competencies and expanding the structure). They should develop a systematic approach to the development of the required skills. First, they must determine PMs' training needs (including measuring PMs' knowledge). Second, they should deliver training programs which correspond with training needs. Third, they have to measure the effectiveness of such training (Kirkpatrick and Kirkpatrick, 2009).

Taking the above into account, it is important that senior management provides HR professionals with the space to act, increase the latter's active involvement in change management as well as increase their interaction with PMs. Since senior managers play the lead role in shaping organizational culture (Cameron and Quinn, 2011), they should demonstrate to other members of the organization how to behave in accordance with the principles of M3.0 and serve as a model to follow for those other members.

The above analysis indicates that there is much room for improvement as far as both M3.0 implementation and people's competencies in M3.0 are concerned. PMs will be able to manage people according to the principles of M3.0. Training in the principles of M3.0 not only provided for PMs but also HR specialists is a promising developmental field for educational institutions. As far as the competencies of PMs are concerned, it is worth emphasizing the importance of their competencies in terms of developing the skills of others. This leads to the conclusion that to successfully develop their teams, PMs should acquire knowledge about the methods and principles applied in adult education, which falls within the domain of andragogy. In turn, it would be worthwhile providing HR professionals with scenario-based learning opportunities which focus on anticipating their roles connected with organizational change (Baran *et al.*, 2019).

Although this study is the first project to focus on the relationships between agile project management, effective implementation of M3.0, and the competencies of PMs and HR professionals, it has a number of limitations which should be addressed in future research. Firstly, calculations based on a larger sample would make a much greater contribution to management science. Secondly, although this study proposed a methodology for identifying the above-mentioned relationships, the research instrument included a number of self-assessment questions regarding the competencies of PMs and third parties (e.g. HR specialists). The authors recommend applying a mixed-method (i.e. quantitative and qualitative) approach, ensuring the participation of a large number of respondents from each surveyed organization and incorporating an objective knowledge assessment test in future research. Thirdly, the present study did not include the participation of any line managers. Since matrix structures exist in companies, organizational change – including in terms of the implementation of M3.0 – also requires modifying the behavior of line managers (Appelo, 2011). Further research may also examine such variables as the knowledge of line managers regarding the assumptions of M3.0.

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