

Agile Transformation in Project Organizations: Issues, Conditions Challenges¹

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Abstract

Large-sized enterprises provide advanced business services and products to their customers through complex, innovative and unique projects and programs. The strong market competition raised a lot of challenges in complex project and program management. Some of the key challenges in the project and program management are: increasing transparency of project planning, growing predictability of customer's deliveries, higher overall project efficiency, and reduction of project delivery cycle duration, improving communication and cooperation between business and project teams, improving project and program portfolio management and developing the right organizational culture.

The primary goal of this paper is to present issues, conditions and challenges of an Agile transformation as an organizational change resultant from introduction of a new Agile project management methodology in the context of the contingency theory.

Based on a review of the literature, multiple case study analysis of companies implementing new Agile project management methodology is presented as empirical research. It is focused on comparison of issues, conditions and challenges of the Agile transformation in large-sized enterprises.

As the results of the research showed, the change of the project management methodology significantly impacted the entire project organization. It was a source of extensive organizational changes in technology, methodology, processes, strategy, structure and organizational culture and it allowed for improving the competitive advantage of the organization.

Key words: *project management, Agile transformation, organizational change, Agile methodology, contingency theory.*

JEL code: M15, O22, O32.

¹ *Second Editions are previously published papers that have continued relevance in today's project management world, or which were originally published in conference proceedings or in a language other than English. Original publication acknowledged; authors retain copyright. This paper was originally presented at the 6th Scientific Conference on Project Management in the Baltic States, University of Latvia, April 2017. It is republished here with the permission of the author and conference organizers*

Introduction

Large-sized companies deliver increasingly advanced business services and products to their customers and stakeholders through complex, innovative and unique projects and programs. A strong marketplace competition stirred up a lot of issues and challenges into complex projects and programs management, as well as into projects and programs portfolio management (Cegarra-Navarro et al., 2016; Appelbaum et al., 2017). The top issues and challenges in the contemporary project and program management are: an increasing transparency of project planning, growing predictability of customer's deliveries, enhancement overall project efficiency, reduction of the time-to-market, increasing innovation and development, improving communication and cooperation among customer, business and project teams, improving effectiveness of project and program portfolio management and development of the right organizational culture.

Agile project management continues its rapid growth in popularity and is being deployed by a number of large-sized organizations through the process called Agile transformation (Gandomani & Nafchi, 2015; 2016; Dikert et al., 2016; Olszewska (née Płaska) et al., 2016). The Agile organization is on the way to become one of the forms of a contemporary organization to cope with marketplace competition by exploring new opportunities and to respond to customers' expectation in an easy, swift, user-friendly and personalized manner (Denning, 2016a; 2016b). Either Agile deployment process or Agile transformation process is somehow unique to a given organization and therefore there is little of empirical research related to a wide-scale organization transformation (Laanti et al., 2011, p. 276). The research results and conclusions presented in this paper might be valuable for organization management and senior executive to facilitate Agile transformation process with less cost, time and effort and improve performance by considering proactively potential issues and challenges.

The primary goal of the empirical research in this paper is to respond to the research question about issues and challenges, supporting and non-supporting conditions and long-term goals of the Agile transformation as an organizational change in large-sized enterprises resulting from the introduction of new Agile project management methodology in the context of the contingency theory. The empirical research results fill the literature review gap for large-sized enterprises delivering complex IT and ICT projects with Agile methodologies. The research results showed that a change of the project management methodologies may lead to wide, integrated and complex organizational changes in technology, methodology, processes, strategy and organizational culture increasing competitive advantage of the organization.

A literature review and a multiple case study analysis of the companies implementing new Agile project management methodology were applied as research methods. The main limitation of research study analysis is the source of multiple case studies. They are largely based on documents available on the Internet, with a number of successful descriptions of the Agile transformation process and only very few details important from the research perspective. Repetition of the same or similar multiple case studies analysis by several different researchers may lead to interesting comparisons and conclusions as a future research opportunity.

The structure of the paper is as follows: the first part discusses the research results and the second part contains conclusions, proposals and recommendations. The first main part is also divided into subchapters presenting: a review of the existing literature, the methodology approach, the empirical research results and the final subchapter discusses the research results.

Research results and discussion

Agile transformation

Numerous large-sized project organizations have started to deploy Agile methodologies in order to gain or increase their competitive advantage on the dynamic and unpredictable marketplace. A transition process from traditional project methodologies to Agile project methodologies is often known as an Agile transformation process and it concerns almost all areas of organization (Gandomani & Nafchi, 2015, p. 204). In most cases, the Agile transformation (or transition) process is impacted by unique, multiple issues, barriers and challenges and it requires a significant effort and long deployment timeframe while collaboration and engagement among team members/engineers, all level managers, and customers are essential (Ibidem; Gandomani & Nafchi, 2016, p. 257, Dikert et al., 2016). The Agile transformation process is a complex, long and evolutionary one due to its nature of organizational changes requiring tailoring, localization and adoption at scale in a large-sized company (Gandomani et al., 2013, p. 2345) while, simultaneously, these changes may look as revolutionary ones from an external perspective – the whole organization is undergoing “metamorphosis”. Due to the scalability challenge, it also requires lots of effort to synchronize all these changes at various interfaces of organizational units (Dikert et al., 2016, p. 87). Due to the process complexity and long period of observation, little empirical research was carried out with its focus on transforming large-scale organizations (Laanti et al., 2011, p. 276).

Parental goal of the Agile transformation process is to provide organization with an agility feature. Organizational agility means the ability to respond rapidly, proactively and intentionally to an unexpected changing demand whilst controlling the risk, efficiently adapt and innovate as well as shrinking the feedback loop (Appelbaum et al., 2017). Agility assists organization with the search, acquisition and retrieval of relevant knowledge in order to apply this knowledge in development of high-quality services and products as well as quickly respond to competitors’ movements (Cegarra-Navarro et al., 2016). Agility also enables organization characterised by a continuous growth, learning and adaptation to utilize new opportunities and to deliver new value as a response to customer-driven and outcome-oriented demands and expectations (Denning, 2011; 2016b, p. 17). Agile as a mindset is much more important than any management methodology itself and only its full adoption may lead to successful Agile transformation process (Denning, 2016a, p. 13-14).

Table 1 presents comprehensive characteristics of the Agile transformation process based on literature review. Note that most studies focused on human-related aspects and challenges as the key ones (Gandomani & Nafchi, 2016, p. 257).

Table 1

Characteristics of the Agile transformation process – desktop review

Issues & challenges	
<p>Scalability, complexity, reliability, scope of changes, governance and long durability of deployment process; communication; dependencies; lack of management support; lack of knowledge and expertise about Agile; lack of training, mentoring and coaching; inadequate and dysfunctional training; ecosystems and rigid organizational culture; national culture; distributed teams; resistance to the change; wrong Agile mindset; interpretation of Agile differs between teams; misconceptions and shortcomings; lack of effective collaboration and cooperation; negative human aspects; customer attitude; technical issues; lack of budget/investment/resources; lack of trust; high workload; old commitments; new difficulties within ongoing process implementation; reverting to the old way of working; excessive enthusiasm; scalability challenges on interfaces in multi-team environment; hierarchical management and organizational boundaries; management in waterfall mode; old bureaucracy; requirements engineering and management challenges; metrics and quality assurance challenges; iterative planning; integrating non-development functions as incremental delivery pace and product launch activities; rewarding model not teamwork centric; self-organizing team; light weight documentation and tacit knowledge; conflicting priorities; lack of taking ownership or decision; lack of empowerment.</p>	<p>Denning (2011; 2016a), Dikert et al. (2016), Fry & Greene (2007), Gandomani et al. (2013), Gandomani et al. (2014), Gandomani et al. (2015), Gandomani & Nafchi (2015; 2016), Gregory et al. (2016), Laanti et al. (2011), Olszewska (née Płaska) et al. (2016).</p>
Supporting & non-supporting conditions (pre-requisites)	
<p>Management support and strong inspirational leadership, commitment and engagement to change; choosing and customizing the Agile approach; effective trainings, coaching and mentoring; communities of practice involvement; correct mindset and alignment; trust; having convincing reason to change; clearly defined business goals; realistic expectations; people and team members buy-in; engaging people; pilot project selection; pre-start assessment; cross-functional rollout team set up; right people selection and empowering team; continuous meetings and negotiations; Agile Champions and Agile Coaches; incentive and motivation factors; communication and transparency; team autonomy; requirements management; patience and long enough timeframe to implement mindset, goals, principles and values; individually adjusted process to organization profile and its own context; overcoming setbacks and experiments openness; self-training; team practices; individual motivation; automation; tools.</p>	<p>Denning (2011; 2016a; 2016b), Dikert et al. (2016), Fry & Greene (2007), Gandomani et al. (2013), Gandomani et al. (2014), Gandomani et al. (2015), Gandomani & Nafchi (2015), Gregory et al. (2016), Paasivaara & Lassenius (2014).</p>

Benefits & long-term goals	
Improvements in areas of: management and organization, people, technology and processes; increased customer visible value and customer focus; self-organizing teams; requirements management; iterative planning; effectively used feedback; accelerating the response to problems; transparency, visibility and predictability; continuous improvement; productivity and efficiency improvements; frequent deliveries – short time-to-market response; knowledge sharing; horizontal communications; strategic engagement and commitment to agility – in terms of quality, speed, cost; adaptable organizational structures; increased business performance; beyond maximizing shareholder value; passionate and friendly workforce; well-functioning communities of practice; enhanced actual control.	Appelbaum et al. (2017), Denning (2011; 2012; 2016a; 2016b), Fry & Greene (2007), Gandomani et al. (2013), Gandomani et al. (2014), Gandomani et al. (2015), Gregory et al. (2016), Laanti et al. (2011), Paasivaara & Lassenius (2014).

Source: author's calculations

Comprehensive and functional training is a fundamental and necessary pre-condition of an Agile transformation process (Gandomani et al., 2015, p. 308). Communities of practice (groups of experts) with common interest and broad knowledge of the domain may facilitate a successful lean and Agile transition, in particular in large-sized organizations (Paasivaara & Lassenius, 2014, p. 1556). As the cost of Agile transformation in terms of money, disrupted working routines and quality of development may become fairly significant, there is a need to quantitatively measure the impact of an Agile transition (Olszewska (née Płaska) et al., 2016).

Contingency theory

The key assumption of the contingency theory is to apply unique contingency approach in organization management due to the lack of universal management methods. Each organization has a unique profile, operates in a different environment, requires different conditions and a different context and, therefore, it is influenced by miscellaneous contingency factors (Nita, 2013, p. 195). The contingency theory assumes that there is no available universal set of management methods and, what is more, the existing ones are impacted by numerous of contingency factors and contextual variables and they are applicable only into individual unique situations and conditions (Otley, 1980). Hambrick & Lei (1985, pp. 764-765) and Fisher (1995, p. 29) presented the contingency view in reference to two other extreme research approaches: to situation-specific view and to universalistic view. In the contingency view, both proximal and distant organization environment affects organization operability and management decisions. The aim of the contingency theory is to recognize some universal features and properties of the organizational management methods and its effective application to the specific group of organization in the unique situation and in a specific context of identified contingency factors (Otley, 1980, p. 413; Nita, 2013, p. 195).

The contingency theory is also applied to the empirical research related to effective leadership, effective incentive systems, adaptive organizational structure, adaptive management methods, project management and strategic management accounting

(Simon, 2007). There are four key components of the research approach in the contingency theory, namely: contextual variables, positive or normative theory, research questions in a given management field and research methods – empirical in the positive theory and deductive in the normative theory (Nita, 2013, pp. 196-197). The empirical research in the positive theory leads to the impact analysis of the existing contingency factors on the already applied management methods, while research in normative theory leads to a search and an offer of a practical solution and improvements of management and organization methods. The empirical research in the contingency theory is focused on recognition of both external and internal contingency factors impacting effectiveness and development of the applied management methods (Nita, 2013).

The Agile transformation in a project organization responds to various contingency factors and conditions in a given enterprise context and in a given enterprise operational environment. This response is triggered by changes in the customer demand and expectations as well as by competitor's movement. A project management transition from traditional methods to Agile methods is an example of wide-scale management method changes initiated by the changing contextual variables in the project organization habitat. There are both external and internal contingency factors which can be identified and classified in terms of Agile transformation process deployment. The context of the contingency theory plays an important role in the Agile transformation process, as it facilitates understanding of issues, challenges, conditions, process nature itself and results of changes introduced in project management methodologies from a positive theory perspective and uses the same research results to introduce some practical improvements in project methodologies from the perspective of the normative theory.

Methodology approach

The main goal of the empirical research in this paper is to present issues and challenges, supporting and non-supporting conditions and long-term goals of the Agile transformation as an organizational change due to the introduction of new Agile project management methodology in the context of contingency theory. The research population is defined as large-sized enterprises implementing a new Agile project management methodology in order to provide advanced business services and products to their customers through complex, innovative and unique projects and programs.

An illustrative and explanatory multiple case studies (ed. Jemielniak, 2012, pp. 14-16; Kozarkiewicz, 2012, p. 202; ed. Czakon, 2015, p. 201) analysis was applied as a research method to find and analyze answers to the research questions about:

- a) The details of the Agile transformation process in terms of issues and challenges.
- b) The root causes and effects of the Agile transformation as a change related to the newly introduced project management methodology.

The aim of the multiple case studies analysis with intentional selection was to answer the research questions and, consequently, to fill the desktop review gap for large-sized enterprises delivering some complex IT and ICT projects. The triangulation method (ed. Jemielniak, 2012, pp. 182-183; ed. Czakon, 2015, p. 248) was applied to present non-arbitrative perspective of the empirical research. The triangulation method results with variety of multiple case studies sources – different enterprises, consultants and authors and with diversity of methods applied to collect all of these 110 case studies. Case studies of 107 enterprises were collected by searching through the existing Internet repository. Documents created by multiple authors and consultants (informant's triangulation) came from 12 different consultant groups (source's triangulation). Two other case studies came from standardized and unstructured interviews with an Agile coach and the last one is based on the author's observations.

The main limitation of the below-presented research study analysis is the source of the multiple case studies by itself. Most of the case studies are based on documents available on the Internet and contain description of successful Agile transformation processes and the same, very limited number of details important in its research. The author's endeavoured to interpret carefully each case to extract as many details as it was possible from the context of the descriptions. Although it could have led to some incorrect or subjective author's interpretations, repetition of the same multiple case studies by several researchers may lead to some interesting comparisons and conclusions and represent a future research opportunity.

As a result of the multiple case studies analysis, 9 single-valued and 9 multi-valued variables were identified for each interpreted case study – see Table 2 for details.

Table 2

Research variables		
Variable	Type	Comments
<i>Industry</i>	Single-valued	Most enterprises applied the Agile transformation process to their IT departments or to IT & ICT projects only. It implies their main areas of interest (see Fig. 1).
<i>Headquarter</i>	Single-valued	More than 55% case studies came from United States companies and the rest from companies outside the US.
<i>Number of employees</i>	Single-valued	Presumably a very important variable from the statistical analysis' perspective, but unknown in most case studies. Here a potential future research gap has been identified which is coming up with a concept of deriving it either from the size of department undergoing the Agile transformation or from the total number of company employees. Most of the examined enterprises employed between 500 and 1,000 employees.
<i>Scalability level</i>	Single-valued	Organization Level - 47% and Project Teams Level - 53%.
<i>Scalability model</i>	Single-valued	The scalability model on the organization level: SAFe - 26%, LeSS - 13%, other - Scrum of Scrums or unknown.

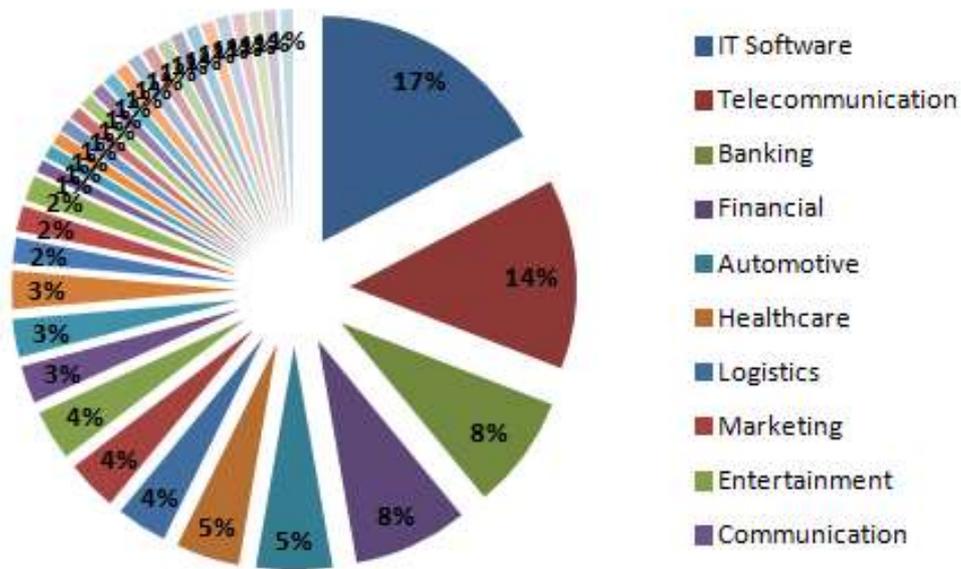
<i>Old PMM²</i>	Single-valued	28% clearly defined as the Waterfall, other unknown.
<i>New PMM</i>	Single-valued	Scrum - 52%, Kanban - 7%, mixed Scrum/Kanban - 3% and other defined as Agile – the exact methodology unknown.
<i>Duration [months]</i>	Single-valued	Presumably a very important variable from the statistical analysis' perspective, but unknown in most case studies. Here is a potential future research gap to specify it or to get more accurate estimation. A rough estimate indicated a period from 1 to 3 years to complete the entire Agile transformation process deployment.
<i>Approach</i>	Single-valued	In all cases defined as a long, evolutionary approach to the process of changes.
<i>Issues & Challenges</i>	Multi-valued	Issues and challenges of the Agile transformation process. See the empirical research results chapter (see Fig. 4).
<i>Long-term goals</i>	Multi-valued	Long-term goals of the Agile transformation process. See the empirical research results chapter (see Fig. 5).
<i>Supporting conditions</i>	Multi-valued	The conditions supporting the Agile transformation process. See the empirical research results chapter (see Fig. 6 & 7).
<i>Non-supporting conditions</i>	Multi-valued	The non-supporting conditions of the Agile transformation process. See the empirical research results chapter (see Fig. 8 & 9).
<i>Major process steps</i>	Multi-valued	The key steps of the Agile transformation process. Will form a part of the future publication.
<i>Organizational changes</i>	Multi-valued	Organizational changes within the Agile transformation process. See the empirical research results chapter (see Fig. 2 & 3).
<i>Transformation Issues</i>	Multi-valued	Agile transformation issues encountered during the deployment process. See the empirical research results chapter (see Fig. 10).
<i>Knowledge Management Actions</i>	Multi-valued	Knowledge management actions encountered in the Agile transformation process. Will form a part of the future publication.
<i>Organizational Method Changes</i>	Multi-valued	Changes within the organizational method in the Agile transformation process. Will form a part of the future publication.

Source: author's calculations

The majority of the Agile transformation deployment (31%) took place in the IT software and telecommunication industries and, specifically, in large-sized IT/ICT departments or even at the level of entire enterprises. Agile methodologies deployments met with high interest on the part of IT departments in financial institutions from the insurance and banking sector (came 2nd with the total of 16% of all deployments). The automotive

² PMM = Project Management Methodology

and healthcare industries ended up among the top 5 leading industries in Agile transformation deployments.

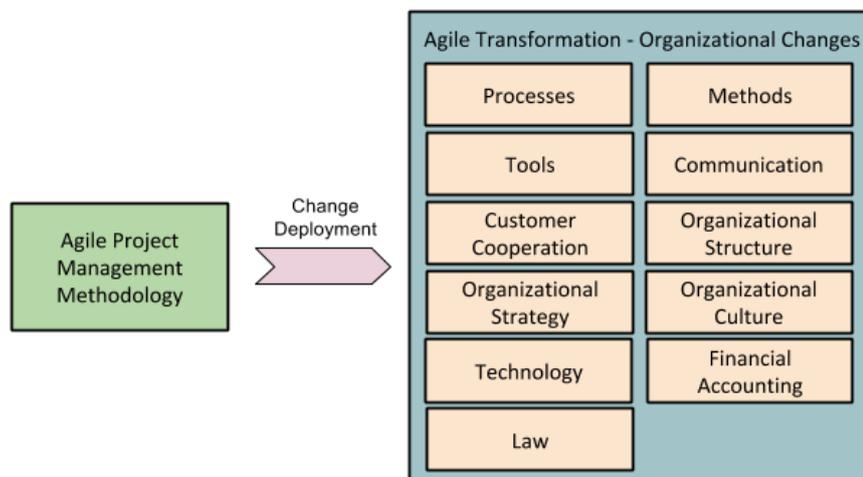


Source: made by the author

Fig. 1. Industry area

Empirical research results

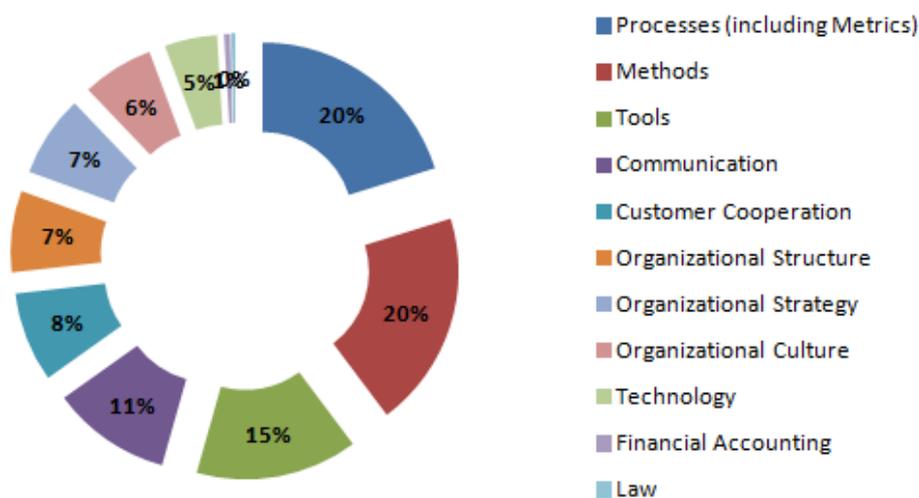
The first very important empirical research result in this paper is the author’s own definition of the Agile transformation deployment process understood as an organizational change brought about by the introduction of a new Agile project management methodology resulting in several areas of organizational changes coupled with the synergy of all these organizational changes.



Source: made by the author

Fig. 2. The Agile transformation overview

Following the research results related to *Organizational changes* variable, the introduction of a new Agile management methodology affected several areas of organizational changes presented in Fig. 2 (The Agile transformation overview) and in Fig. 3 (Organizational changes within the Agile transformation). Fig. 3 presents weighted results defined as a percentage of all the marked changes in order to mark the most important areas: processes with new metrics indicators, methods, tools, communication and customer cooperation. An individual case study assessment of each organizational area of changes was as follows: processes – 97% of all 110 case studies, methods – 95%, tools – 70%, communication – 52%, customer cooperation – 39%, organizational structure – 35%, organizational strategy – 35%, organizational culture – 31%, technology – 23%, financial accounting – 3% and law – 2%.

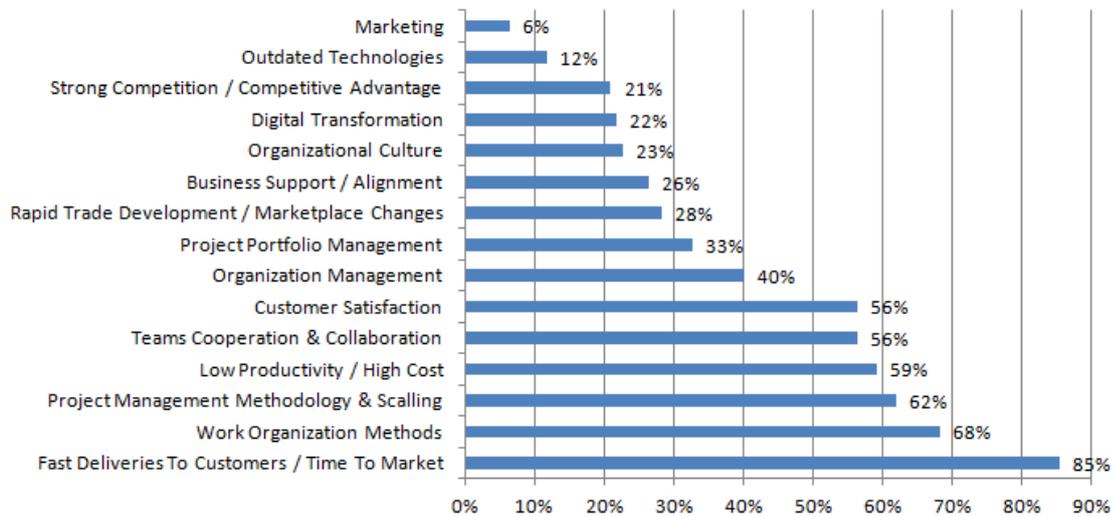


Source: made by the author

Fig. 3. **Organizational changes in the Agile transformation process**

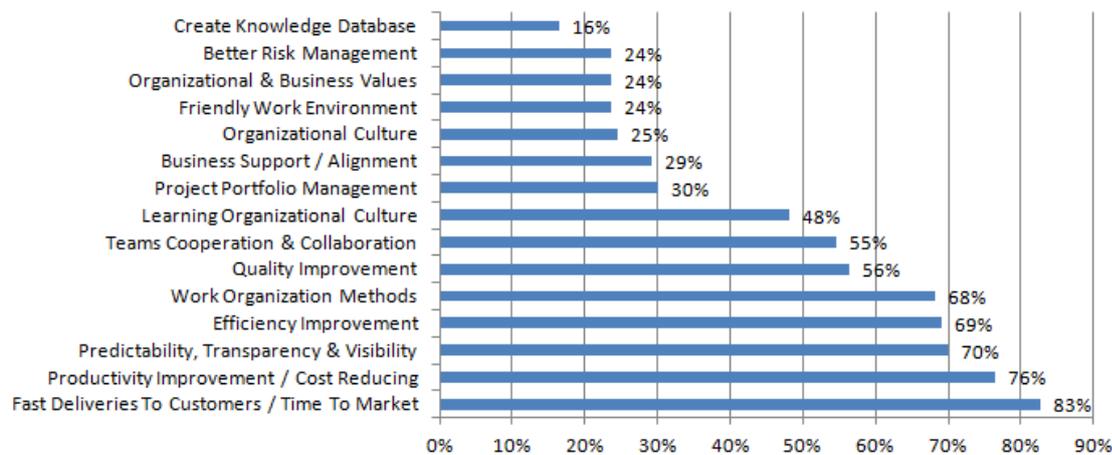
The research result analysis of *the Issues & Challenges* variable identified a number of organizational issues and challenges faced by organization heading for the Agile transformation deployment. Fig. 4 presents an individual assessment of each identified organizational issue or challenge for each of 110 case studies. Most of the Agile transformation deployment decisions were connected with exploring the opportunities arising from the competitive advantage of the organization in a given industry area. Note that, in most Agile transformation cases, the decision was not based on a single factor but more on a synergy of several or more organizational issues and challenges leading to the decision over a longer period. Furthermore, the decisions were complex, difficult, costly, risky and, in many instances – irreversible and they were related to the organizational strategy and coupled with its long-term goals. Fig. 5 presents the individual assessment of each identified organizational long-term goal in terms of each of 110 case studies. Both *Issues & Challenges* and *Long-term goals* are complementary variables, as particularly demonstrated by the top expectation from the Agile transformation process deployment – namely, reducing the time-to-market of a service or product delivery. Other significant factors connected with the decision about large-sized Agile transformations included: operability cost reduction – productivity and

efficiency improvements, predictability, transparency, visibility, scalability and quality improvements.



Source: made by the author

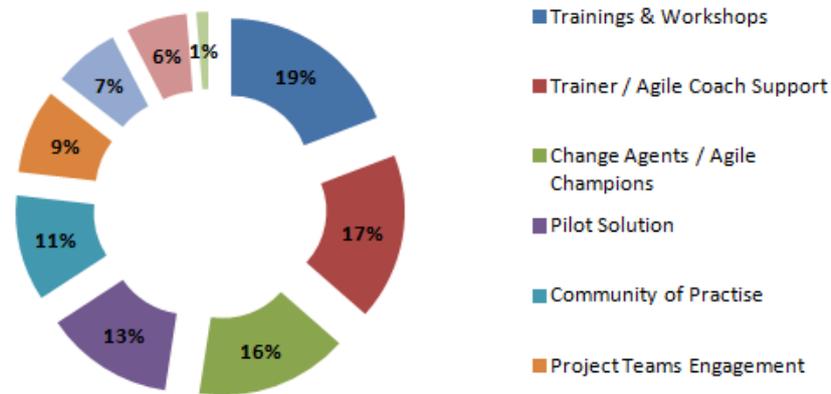
Fig. 4. Issues and challenges leading to the Agile transformation



Source: made by the author

Fig. 5. Long-term goals of the Agile transformation process

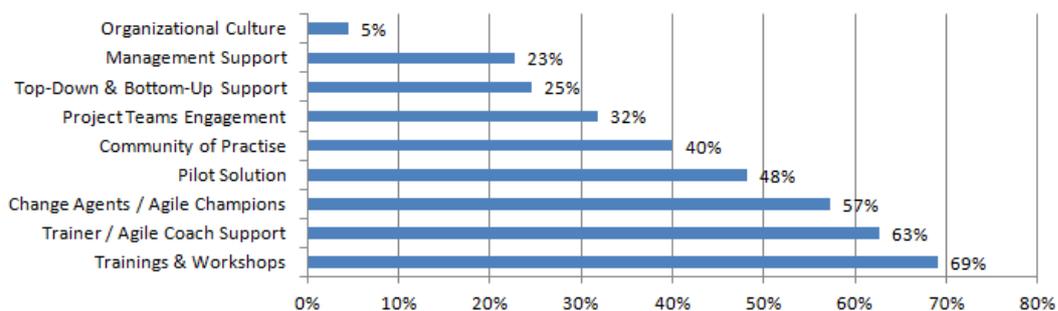
A research result analysis of the *Supporting conditions* variable generated a few hints for the organization planning to approach the Agile transformation process deployment. Fig. 6 presents weighted results understood as a percentage of all marked supporting conditions in all 110 analyzed case studies. The purpose of the presentation is to emphasize the most supporting conditions for the Agile transformation process, such as: trainings & workshops, external trainer or Agile coach support, change agents or Agile champion support, pilot solution in one of organization’s project or department, community of practise involvement and/or project team engagement.



Source: made by the author

Fig. 6. Conditions supporting the Agile transformation process

Fig. 7 presents an individual assessment of each identified supporting condition in terms of each of 110 case studies. The more supporting conditions were identified, the less risk related to transformation process deployment existed. A synergy of all supporting conditions is also supporting condition by itself. However, the more supporting conditions were met – the higher cost of the process must have been. This cost should be carefully considered before making any deployment decision. The roughly estimated Agile transformation duration was from one to three years. It is a very evolutionary and long process, which is almost impossible to speed up in large-sized enterprises. Research results showed that the management support (23%) and organizational culture (5%) came last in the results but, in reality, they both require much more attention from the senior executives' perspective. As pointed out during the author's interviews with Agile coaches, without enough management support the failure is relatively high and even a successful Agile transformation takes long to be codified in the organizational culture.

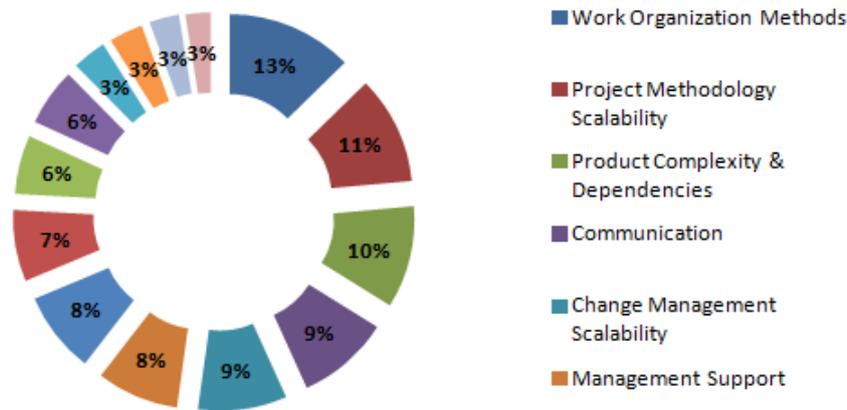


Source: made by the author

Fig. 7. Supporting conditions of the Agile transformation process

The research result analysis of *the non-supporting conditions* variable resulted in a number of factors preventing or slowing down the organization which underwent the Agile transformation process deployment. Fig. 8 presents the weighted results representing a percentage of all marked non-supporting conditions in all the 110 analyzed case studies. The purpose of the presentation is to identify and stress the

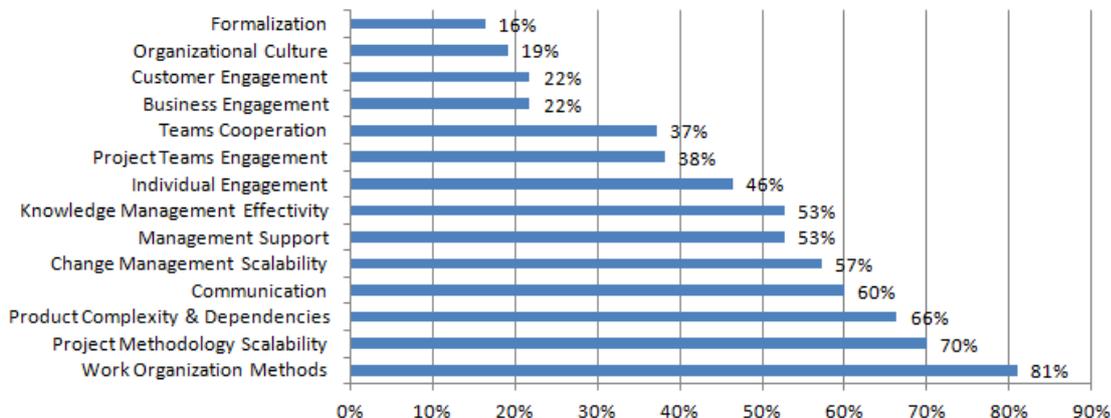
least supporting conditions (i.e. the most non-supporting conditions) of the Agile transformation process.



Source: made by the author

Fig. 8. Non-supporting conditions of the Agile transformation process

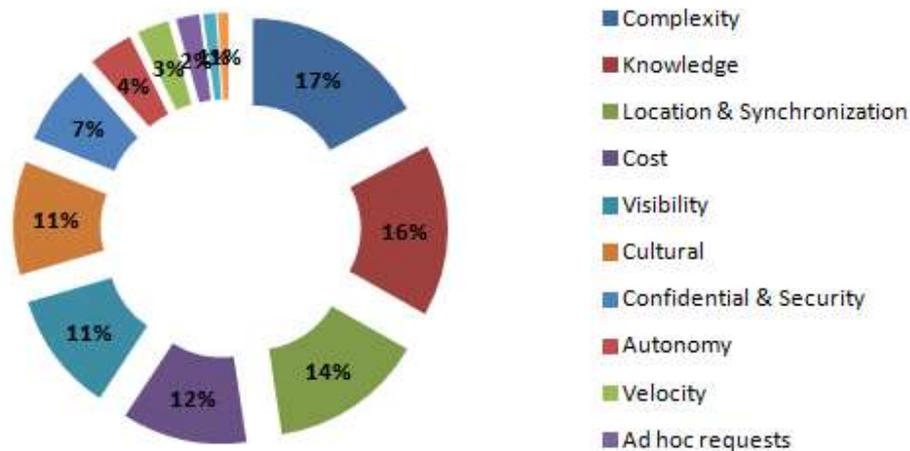
Fig. 9 presents an individual assessment of each identified non-supporting condition for each of 110 organization case studies.



Source: made by the author

Fig. 9. Non-supporting conditions of the Agile transformation process

While the supporting conditions focused mainly around training and learning factors, the non-supporting conditions fell into the area of: work organization methods, scalability of project management methodology, product complexity and its dependencies, related communication issues and required management support.



Source: made by the author

Fig. 10. Agile transformation issues encountered during the deployment process

A research result analysis of the *transformation Issues* variable gave an overview of the Agile transformation process deployment issues. Fig. 10 presents its weighted results understood as a percentage of all marked transformation issues in all 110 analyzed case studies. The purpose was to emphasise the most impacting issues for the Agile transformation process deployment. Individual assessment of each transformation issue resulted in: change complexity by itself – 79% of all 110 case studies, required Agile knowledge and experience – 75%, location and synchronization issues among different enterprise locations – 66%, total process deployment cost – 54%, visibility and change tracking – 52%, rigid organizational culture – 49%, violation of confidential & security – 35%, project team’s autonomy – 19%, measuring team velocity – 14%, handling ad hoc requests – 10% and granularity and estimation issues both 5%.

Results discussion

The author’s empirical research presents Agile transformation as an organizational change initiated by the introduction of new Agile project management methodology (Fig. 2). This change brought about organizational changes in several other areas including: processes with new metrics indicators, methods, tools, communication, customer cooperation, organizational structure, organizational strategy, organizational culture, technology, financial accounting, law as well as synergy of all these changes (Fig. 3). Gandomani & Nafchi (2015, pp. 209-212) and Appelbaum et al. (2017) propose their own framework and model of the Agile transition. Organizational changes presented by above research results and related to the Agile transformation in large-sized companies correspond to changes described in wide-scale transformation case studies (Fry & Greene, 2007; Laanti et al., 2011; Denning, 2011; 2012; Paasivaara & Lassenius, 2014; Gregory et al., 2016). As the process impacts many organizational areas (Fig. 3) and it is complex, costly, time-consuming and effort-demanding in its nature (Fig. 10), there is a confirmed necessity to quantitatively measure its impact (Olszewska (née Płaska) et al., 2016).

Issues & challenges (Fig. 4 & Fig. 10), benefits and long-term goals (Fig. 5) are complementary aspects of the large-sized Agile transformation process. Once issues and challenges are resolved, there is a simple way to gain benefits or to reach long-term organizational goals such as: reducing the time-to-market of service/product deliveries, increasing customer satisfaction, achieving operating cost efficiencies, in terms of productivity and efficiency improvements, work organization method improvements as well as predictability, transparency, visibility, scalability and quality improvements. The presented research results concerning issues & challenges, benefits and long-term goals are complementary with already existing research results based on a literature review (Table 1), as well as directly with: quantitative research results (Laanti et al., 2011; Gregory et al., 2016), qualitative research results (Fry & Greene, 2007; Denning, 2011; 2012; Paasivaara & Lassenius, 2014; Gandomani et al., 2014; 2015; Gandomani & Nafchi, 2015; 2016; Gregory et al., 2016) and other research results based on desktop reviews (Gandomani et al., 2013; Denning, 2016a; 2016b; Dikert et al., 2016; Appelbaum et al., 2017).

The authors' empirical research result and the literature review revealed jointly a number of supporting & non-supporting conditions, which are also called transformation facilitators, pre-requisites or pre-conditions (Fig 6-9 and Table 1). The supporting conditions concerned effective training, learning, coaching and mentoring preceded with a pilot solution of the transition process while the non-supporting conditions included: work organization methods, scalability of the project management methodology, product complexity and dependencies, communication, management support and knowledge-sharing (Fry & Greene, 2007; Denning, 2011; 2016a; 2016b; Gandomani et al., 2013; 2014; 2015; Paasivaara & Lassenius, 2014; Gandomani & Nafchi, 2015; Dikert et al., 2016; Gregory et al., 2016).

The above-listed supporting and non-supporting conditions of the Agile transformation may be interpreted according to the contingency theory and classified to external and internal contextual variables in a given class of unique large-sized enterprises undergoing changes in project management methodologies (cf Simon, 2007; Nita, 2013). Strategy, organization, culture and technology were identified as internal contingency factors, whereas the industry sector and macroeconomic factors are classified to external ones. The internal factors largely correspond to the supporting and non-supporting conditions presented in Table 1, while the industry sector and macroeconomic factors can be related to: the digital transformation, rapid trade development, IT & ICT development, pervasive computing, big data, knowledge sources selection, globalization, IT outsourcing and offshoring. Each unique large-sized enterprise should adapt its practices to their own context (Denning, 2016a). The key role of the contingency theory in the Agile transformation process is perceivable in: selection and adaptation of the project management methodology, changes of the organizational structure, knowledge management and organizational culture.

Conclusions

The Agile transformation deployment process is a complex, evolutionary and long-lasting way of introducing changes to gain organizational agility and thus to gain a powerful tool to overtake competitors on a dynamic and unpredictable marketplace. It

requires scalability, tailoring, localization and adoption in a large-size project organization.

The following key conclusions are the main research findings:

1. The Agile transformation process in large-sized project enterprises is an organizational change resultant from the introduction of new Agile project management methodology and leads to several areas of other organizational changes. The empirical research results showed a change to the Agile project management methodologies resulting from several areas of wide, comprehensive and complex organizational changes such as processes with new metrics, methods, tools, communication, customer cooperation, organizational structure, organizational strategy, organizational culture, technology, financial accounting, law as well as a synergy of all these changes.
2. The Agile transformation issues & challenges and benefits & long-term goals come as complementary aspects of the wide-scale Agile transformation process. Resolution or mitigation of the issues and challenges translates into benefits or achieving long-term organizational goals such as reduced time-to-market of service/product deliveries, increased customer satisfaction, operating cost efficiencies – in terms of productivity and efficiency improvements, improvement of work organization methods as well as improvement of predictability, transparency, visibility, scalability and quality.
3. The Agile transformation supporting & non-supporting conditions are essentially facilitators, pre-requisites or pre-conditions of a deployment/transition process in large-sized project enterprises. The major supporting conditions are: effective training, learning, coaching and mentoring and pilot solution change while the non-supporting conditions are: work organization methods, scalability of project management methodology, product complexity and dependencies, communication, management support, knowledge sharing and management support.
4. The Agile transformation process analysed in terms of the contingency theory results in identifying and classifying external (industry sector and macroeconomics) and internal (strategy, organization, culture and technology) contextual variables in a given class of unique large-sized enterprises undergoing changes in the project management methodologies.

The key proposals and recommendations are as follows:

1. As the Agile transformation process is impacted by multiple issues, barriers and challenges, it requires considerable investment of resources, long deployment timeframe as well as strong collaboration and engagement of team members, all level managers, and customers to synchronize all the changes and resolve scalability issues of all organizational units in a large-sized company.

2. Prior to any deployment of a wide-scale Agile transformation, the executive management has to assure provision of comprehensive and functional training, mentoring, coaching and learning at all levels of the organization, ideally supported with one or more additional sources of practical Agile knowledge – for instance: change agents, Agile coaches and champions or communities of practice.
3. During the Agile transformation process, large-sized enterprises should continuously develop their own agility feature i.e. the ability to respond rapidly, proactively and intentionally to an unexpected changing demand whilst controlling the risk, efficiently adapt and innovate as well as shrinking the feedback loop. It will enable enterprises to deliver high-quality services and products as well as quickly respond to competitors' movements.
4. Large-sized enterprises should adapt project management methods and practices as well as Agile transformation process deployment to its own environmental context. Appropriate selection and adaptation of project management methodology, changes in organizational structure, knowledge management and organizational culture are possible to address with using contingency theory approach.

The cost of Agile transformation in terms of money, people effort/engagement and quality of development may become quite significant, so it should be quantitatively measured in terms of the organization impact. It is also a very interesting field for the further comprehensive studies as well as deeper empirical research from the project management perspective. Agile as a mindset is much more important than any management methodology itself and only its full adoption may lead to a successful Agile transformation process.

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