DESIGNING CAPABILITY MATURITY MODEL FOR AGILE TRANSFORMATION EXCELLENCE

Research-in-Progress

Track N° 7 - Management, Governance & Portfolio Management of Digitalization Projects

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Abstract

As organisations are challenged with volatility, uncertainty, complexity and ambiguity (VUCA), developing Agile capabilities becomes first priority for most organisations to innovate and disrupt entire markets. A great number of companies, however, face significant challenges to effectively manage organisational change while developing Agile capabilities. In this paper-in-progress the author adopts Design Science approach and develops an artefact - Capability Maturity Model (CMM), which promises to solve abovementioned challenges. Although maturity models (MMs) are an established instrument to devise development paths, currently available Maturity Models often focus on the control of certain capabilities (doing things right) rather than on developing the necessary capabilities in a sequence appropriate for a given type of organization (doing the right things) (Winter, R., Aier, S., 2019). Therefore, the proposed artefact will focus on devising capability development sequences that correspond to organisational learning, rather than control levels. In particular, such management tool will help organisations (1) to assess the current maturity of their Corporate Agility capabilities, (2) to create a basis for defining their target state, (3) to enable fact-based communication with a large group of stakeholders concerning organisation's agility transformation, and (4) to derive concrete measures (roadmap) for directed improvement of the capabilities.

Keywords: Agile Transformation Excellence, Capability Maturity Model, Organisational learning.

1 Introduction

As organisations are challenged with volatility, uncertainty, complexity and ambiguity (VUCA), developing Agile capabilities becomes first priority for most organisations to innovate and disrupt entire markets. Companies must continually update existing technology and launch innovative products to keep up with the most disruptive competitors. Corporate agility is regarded as a 'survival' organisational capability to adapt to rapid changes in the business environment (Lehn, 2018). An enterprise has to undergo a major transformation to begin reaping the long-term benefits of Agile. Such transformation journey often begins with a series of frustrating stops and starts interspersed with seemingly interminable layovers. According to the recent Business Agility report by Accenture (2018), there is a significant growth of companies struggling to effectively manage organisational change while developing Agile capabilities. The research draws attention to a low rate of organisations' business agility fluency, emphasising difficulty of developing agile capabilities as one of the biggest challenges that most organisations are facing during their Agile Transformation journey (Accenture, 2018).

Companies have made significant investments into Agility transformation projects over the last few years (Trad & Kalpic, 2018). However, only a very limited number of enterprises have translated the results of Agility Transformation projects into increased maturity of Corporate Agility (Smart, 2018), mainly due to inconsistent impact on all organizational levels and in all relevant areas and/or increas-

ing control maturity instead of establishing a situated organizational learning process (Winter, R., Aier, S., 2019). As organizational learning is highly situational and affects large portions of the organisation, Winter and Aier (2019) state that companies need to not only develop situated roadmaps, but also navigational capabilities to effectively guide the transformation journey. Research on this process shows, that classical top-down governance and control approaches have only limited effects in reaching this goal (Winter, R., Aier, S., 2019). Arguably, this holds particularly true for organisations, where managers of Agile transformation project focus on the control of certain capabilities (doing things right), rather than on developing the necessary capabilities in a sequence appropriate for a given type of organization (doing the right things). This leads to a research question of this paper: *how to effectively guide organisations in their learning process towards Corporate Agility?*

An initial step to develop Agile Transformation Excellence is to measure it. However, up to now organisations are lacking an enterprise-wide measurement system that allows them to quantify and compare Corporate Agility maturity and its evolution over time. In this research the author therefore aims to develop an organisational learning tool, so called Agility Navigator, which provides guidance on systematically navigating through the Agility Transformation journey, i.e. identify and specify capabilities as means to Agility Transformation Excellence. The main focus will be on devising capability development sequences that correspond to organisational learning, rather than control levels. To this end the author adopts Design Science approach and develops an artefact - Capability Maturity Model (CMM), the core element of Agility Navigator. Such management tool promises to help organisations (1) to assess the current maturity of their Corporate Agility capabilities, (2) to create a basis for defining their target state, (3) to enable fact-based communication with a large group of stakeholders concerning organisation's agility transformation, and (4) to derive concrete measures (roadmap) for directed improvement of the capabilities. Enterprises often do not know how they perform with regards to developing Corporate Agility Capabilities, nor do they know how the development of Agile capabilities is correlated with performance. To this end, the organisational learning tool and maturity assessment instrument will effectively navigate senior management team along Agile Transformation journey aiming to develop Corporate Agility as a core organisational capability. Such artefact will empower Executive Managers to analyse over time how the development of Agile Transformation capabilities is correlated with performance.

2   The context: Capability Maturity Model development for Agility Transformation

The author aims for an empirical grounding of the design, therefore firstly concepts of maturity and Maturity Model development for Agility Transformation will be discussed. Then, the author will discuss the state-of-the-art of Corporate Agility maturity models as the starting point and foundation for design journey.

2.1   Maturity concept and maturity model development

Maturity is commonly defined as a means "to evaluate the capabilities of an organisation in regards to a certain discipline" (Rosemann & De Bruin, 2005). MMs are conceptual models that depict evolution paths towards maturity (Becker, Knackstedt, & Pöppelbuß, 2009), thereby being an accepted instrument for systematically documenting and guiding the development and transformation of organizations on the basis of best or common practices (Paulk, Curtis, Chrissis, & Weber, 1993). The concept of MMs has initially been proposed during the 1970s (Gibson & Nolan, 1974). In the field of IS alone, over a hundred MM instantiations had already been published by 2009 (Mettler, Rohner, & Winter, 2009). Special emphasis has been put on the Capability Maturity Model (CMM) for software development (Paulk et al., 1993). Table 1 briefly summarizes fundamental MM concepts.

Elements	Description
Dimension	Dimensions are domains or categories for capabilities, i.e. a set of related capabilities. It is recommended to formulate dimensions in exhaustive and mutually exclusive manner (Mettler & Rohner, 2009).
Capability	At the very core of maturity models are capabilities that are related to objects such as project or knowledge management (Crawford, 2006; Paulzen, Doumi, Perc, & Cereijo-Roibas, 2002), people/workforce (Curtis, Hefley, & Miller, 2010), systems and technologies (Popovic, Coelho, & Jaklič, 2009), and processes (Chrissis, Konrad, & Shrum, 2003; Paulk et al., 1993).
Level	Levels represent archetypal stages of maturity. Each level is related to a specific set of capabilities that ultimately should be empirically testable (Nolan, 1973).
Core model	The core (maturity) model represents the relationships between dimensions, capabilities, and levels.
Assessment instrument	The assessment instrument is based upon the core model assigning testable assessment criteria to each of the dimensions and levels.

Table 1.   Fundamental MM concepts

Since capabilities are a Maturity Model's common denominator for all relevant problem dimensions and issues, a Maturity Model is considered an effective tool to design an anticipated and/or logical evolution paths from an initial ('as is') to a desired ('to be') target stage in a coherent way (Kazanjian & Drazin, 1989). Eventually, Maturity Models have become a well-established assessment instrument to define and analyse the strengths and weaknesses of organizations as a whole (Benbasat, Dexter, & Mantha, 1980) or certain domains thereof (Ramasubbu, Mithas, Krishnan, & Kemerer, 2008).

2.2   Agile Transformation maturity models

Over the past few decades, Agility Transformation management has received considerable attention in both academia and in practice, which has led to a collection of processes, methods, and tools to develop, introduce and continuously evolve Agility capabilities (Gunsberg et al., 2018). Table 2 presents the excerpt from literature review, where notable examples of existing maturity models were proposed in the field of Agility Transformation.

No.	The title of research paper	Source
1	Seven Dimensions of Agile Maturity in the Global Enterprise: A Case Study.	(Benefield & Ieee, 2010)
2	Development of the Organizational Agility Maturity Model.	(Wendler & Ieee, 2014)
3	The prospects of a quantitative measurement of agility: A validation study on an agile maturity model	(Gren, Torkar, & Feldt, 2015)
4	Agile Maturity Model: Oxymoron or the Next Level of Understanding.	(Schweigert, Nevalainen, Vohwinkel, Korsaa, & Biro, 2012)
5	Agile maturity model: analysing agile maturity characteristics from the SPICE perspective.	(Schweigert, Vohwinkel, Korsaa, Nevalainen, & Biro, 2014)
6	Implementation of the Model of Maturity to Agility Assessment.	(Stachowiak & Mazur, 2017)
7	Applying an organisational agility maturity model.	(Gunsberg et al., 2018)

Table 1:   Notable examples of existing Agility Maturity Models

However, what CMMI shares with many other Maturity Models is the fact that they impose a governance perspective on a set of core capabilities within a certain domain such as software development. All the examples of Maturity Models presented above do not help to identify which capabilities should be developed in which sequence ('doing the right things'), instead they focus on systematically improving control of all capabilities that are regarded to be essential ('doing things right'). Therefore, the author makes a conclusion that reliable artefacts for describing and measuring the Corporate Agility maturity level of organizations, and for guiding their Agility evolution from the perspective of organizational learning ('doing the right things'), are not available. A proposed design journey thus aims at designing a Maturity Model (MM) focusing on devising capability development sequences that correspond to organisational learning, rather than 'top-down' control levels.

3 Navigating through the Agility Transformation journey

As the author intends to propose a reliable artefact for describing and measuring the Corporate Agility maturity level of organizations, the paper in hand will mainly follow the process model of Peffers et al. (2007) for design science research (Peffers, Tuunanen, Rothenberger, & Chatterjee, 2007).

3.1 Developing maturity model for Agile Transformation Excellence

A problem understanding was driven by the analysis of requirements for Maturity Model development in general and Corporate Agility Maturity Model development in particular. To reflect the discussion in section 2.2 regarding the state-of-the-art maturity models, the list of core requirements was created to drive the development of new artefact. The list below, however, should not be considered exhaustive as more requirements can be formulated during the development stage.

R1. Maturity shall focus on organizational learning ('doing the right things'), not on governance and control ('doing things right').

R2. MM quality and utility shall be evaluated.

R3. MM shall be accompanied by an assessment instrument.

R4. MM shall be grounded in (domain-specific success) theory.

The author mainly follows a design method for Maturity Models proposed by Winter and Aier (2019). On the meta level the design process starts with developing a metamodel covering all relevant perspectives for a given domain. Often this development can be based on respective theory (e.g. IS success models), on practices and capabilities that can be observed in practice, and/or can be condensed from empirical research in the respective domain. For developing the Corporate Agility Maturity Model, the author will develop and validate a Corporate Agility success model. It is common to differentiate two types of DSR knowledge (Mokyr, 2002) and their interaction (Gregor & Hevner, 2013). Descriptive knowledge is about natural phenomena and the regularities among them, while prescriptive knowledge is the "how" knowledge of artefacts (Winter & Aier, 2019). The author considers to contribute first to descriptive knowledge (i.e. collecting corporate Agility capabilities and performance indicator) in order to create an appropriate foundation for rigorously designing and contributing to prescriptive knowledge.

Capabilities are described as skills, competencies, and abilities, upon which the value of organisation's resource can be leveraged (Doherty & Terry, 2009). The Corporate Agility success model is based on Agility capabilities; therefore, a critical number of Agility capabilities will be collected from the Literature review. By validating the means-end relationships between key Corporate Agility capabilities and organisational performance, the author aims at setting the basis to develop an effective Corporate Agility Maturity Model. Following Goldkuhl (2004), the Corporate Agility success model will serve as a value grounding for the Corporate Agility MM, i.e. it provides evidence that a certain set of Agile-related capabilities indeed have an impact on business value (Goldkuhl, 2004). Ultimately, the Corporate Agility success model will act as a theoretical justification for the Corporate Agility Maturi-

ty Model and will be transformed into a set of prescriptive statements (Kuechler & Vaishnavi, 2008) captured by the Corporate Agility Maturity Model.

In a second step on the meta level the author seeks for a Maturity Model population technique that appropriately clusters capabilities and assigns these clusters of capabilities to certain maturity levels. In order to adequately capture the organizational learning processes (and the relative difficulties of its stages) in the context of Agility Transformation and their complex sociotechnical environments, it is decided to follow an empirically grounded, quantitative approach (Lahrmann, Marx, Mettler, Winter, & Wortmann, 2011). Winter and Aier (2019) proposed in their paper to apply Rasch algorithm as an Item Response Theory (IRT)-based approach to use in combination with cluster analysis (Winter & Aier, 2019). IRT in general and its Rasch operationalization in particular measure the difficulty of items and the respective capability of organizations on the same scale based on quantitative, e.g. questionnaire data. Thus, the Rasch algorithm provides an empirically grounded list of capabilities ordered by their perceived difficulty (Winter & Aier, 2019). The capabilities on this list can then be clustered and assigned to maturity levels based on their position on the list. For the proposed Corporate Agility Maturity Model, the author will collect empirical Corporate Agility maturity data and run it through the Rasch algorithm. The result will be an array of relevant capabilities, sorted by its difficulties from the least difficult (that all organizations are able to achieve) to the most difficult (that only the most successful organizations are able to achieve). The capabilities are then clustered into sets of similar difficulty. The optimal number of sets could be determined quantitatively. These clusters of capabilities represent the organizational learning stages of Corporate Agility, starting from an initial stage of "low hanging fruits" all the way to the final stage comprising the most difficult capabilities.

In order to serve as a practical guidance for organizations, the Maturity Model will be provided together with a maturity assessment instrument. Therefore, the author will derive a questionnaire from the Corporate Agility MM and define a procedure on how to calculate the Corporate Agility maturity level for a given organization on the basis of the questionnaire (Raber, Wortmann, & Winter, 2013b). Thus, as part of a design science research project, it will be necessary to develop a MM evaluation technique to test, whether an empirically assessed maturity level of a set of organizations is statistically significantly correlated to the defined success measures (Raber, Epple, Rothenberger, & Winter, 2016).

To summarize the section, a set of requirements will be further defined to design a Corporate Agility Maturity Model based on an analysis of existing Agility MMs, their documentation, and as far as available, their development processes. By comparing real-life Agility maturity assessments using the proposed Corporate Agility MM with an alternative evaluation (qualitative case studies), the author aims to show that the Maturity Model development process does not only analytically satisfy stated design requirements, but also creates assessments that correspond to traditional maturity evaluations (Raber et al., 2016).

3.2   Situated maturity assessment

To calibrate an assessment instrument, it will be necessary to verify whether there will be different clusters of capabilities, assigned differently to maturity levels, if the Rasch algorithm will be run with certain subsets of cases (Winter & Aier, 2019). As a foundation of a situational Corporate Agility MM, first, contingencies will be identified that are relevant moderators for the definition of maturity levels. Thus, such parameters as size of the organisations or the environment (service or non-service industries) will be applied to analyse whether they significantly moderate the definition of maturity levels. As a result, the correlations of Corporate Agility maturity level and success is expected to be further improved (Raber, Wortmann, & Winter, 2013a). As a result, a learning path will be further customised for specific types of organisations in order to reflect specific challenges and opportunities.

4   Expected Results

The designed artefact will be further described in the final paper. In particular, the artefact on the meta level will be described, including the Agility Transformation success model, the Maturity Model population technique, and the evaluation technique. Accordingly, an artefact on the Agility instance level will be present in this section, including the Corporate Agility Maturity Model and the Corporate Agility maturity assessment instrument.

The author claims that an appropriate Agility Transformation success model-based survey will create a data set, which, using the Rasch-based Maturity Model population technique, will afford to create a Maturity Model and a maturity assessment instrument for the respective domain that meet the requirements stated in section 3.1.

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