A conceptual framework of strategy, action and performance dimensions of organizational agility development

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Abstract Agility is today a key dimension of organizational excellence as it encompasses the aptitude to successfully respond to changes in the surrounding environment. Although existing research has investigated specific perspectives of organizational agility, an integrative framework is yet to be introduced. This article aims to address this gap by presenting a conceptual model that encapsulates various dimensions critical to the development of agility within organizations. An extended review of literature is used to identify agility-related concepts and a design science approach is adopted to build the framework. Three macro-areas are described in terms of 7 propositions and dimensions and 30 items concerned with an agility development initiative. The main value of the article is to provide a holistic view of agility and a number of interdisciplinary perspectives into a single representation framework. The model can also support managers involved into the execution of agility development initiatives.

Keywords *Agility Development; Business Agility; Framework; Organizational Agility; Performance; Strategy*

Paper type Research Article

1. Introduction

The world of business is facing deep and fast changes generated by pervasive technological innovation and global competition. Enterprises are concerned with uncertainty and unpredictability within their environment and this puts a pressure on the organizational ability to capture and react to external changes. Such reaction and adaptation capability is mostly associated with the concept of agility (Bessant, Knowles, Briffa and Francis, 2002).

Given its deep potential impact on competitiveness, agility can be advocated as the business paradigm of the 21st century and the dominant vehicle for competition (Zhang and Sharifi, 2007). Although there is no consensus on the definition (Bernardes and Hanna, 2009; Van Oosterhout, Waarts and Van Heck, 2006; Wadhwa and Rao, 2003), agility has generally been referred to the ability of an enterprise to respond quickly and successfully to change and to address a wide range of customer demands (Adarsh Kumar and Sekar, 2017). The concept builds from the literature on flexibility in economics and it was developed further in manufacturing (e.g. Gunasekaran and Yusuf, 2002; Sharifi and Zhang, 2001; Yusuf, Sarhadi and Gunasekaran, 1999; Zhang, 2011; Zhang and Sharifi, 2007) and supply chain management (e.g. Christopher, 2000; Li, Goldsby and Holsapple, 2009; Ngai, Chau and Chan, 2011; Qrunfleh and Tarafdar, 2013).

The strategic management literature has studied the importance of establishing a fit between the company strategy and the environment using deliberate or reactive approaches aimed to develop adaptation, changeability and resilience (Lengnick-Hall and Beck, 2005). In such view, agility can be deliberately developed within an organization as a set of capabilities that enable the firm to work on its business model to respond to uncertainties for survival and strategic success (Battistella, De Toni, De Zan and Pessot, 2017). Key questions should be addressed at this regard: a) what are the critical factors for a successful agility development effort? b) how agility should be defined and determined for specific requirements of

organizations?; and consequently c) how the multi-faceted aspects of organizational agility, as are projected in existing research, may be integrated into a unified model?

Different research articles have been published on organizational agility, with a focus spanning from strategy to supply chain and operations management and information systems. Most of existing research has investigated specific aspects or perspectives of agility, with only few attempts to set out generic frameworks for defining and explicating agility. A holistic model to encompass all dimensions of agility development into a unique integrative framework is yet to be introduced.

This article aims to address this gap, which concerns both scholars and practitioners. The paper presents a conceptual framework, developed using a design science method and based on an extended review of literature, that encapsulates various dimensions critical to the development of organizational agility. To achieve such goal, the remainder of the work is organized as follows. Next section presents the theory background, with a specific focus on extant literature trying to delineate definitions, approaches and methods associated to organizational agility development. Section 3 illustrates the research method and introduces the agility-related concepts extracted from literature, with an attempt to classify the same into a number of focus areas. Section 4 presents the organizational agility framework by introducing a detailed discussion of the strategy, action and performance-related dimensions and related elements. Section 5 concludes the paper with discussions, limitations and avenues for further research.

2. Theory Background

The background of this paper can be identified in those research works describing the concept of organizational agility and presenting practical approaches to support agility development initiatives. A number of papers have attempted to review classification perspectives of agility. Bernardes and Hanna (2009) presented a theoretical review of flexibility, agility and responsiveness. The authors proposed a conceptual differentiation of the three terms and agility is used to describe an approach to supporting rapid system reconfiguration in the face of unforeseeable changes. Sherehiy, Karwowski and Layer (2007) realized a review of enterprise agility concepts, frameworks, and attributes. The study identifies the global characteristics of agility that can be applied to all aspects of enterprise, i.e. flexibility, responsiveness, speed, culture of change, integration, high quality and customized products, and mobilization of core competencies. Wendler (2013) conducted a systematic comparison of agility frameworks in the domains of agile manufacturing, agile software development, agile organization, and agile workforce. The comparison shows a lack of consensus about the utilized concepts and constructs, which are sometimes ambiguous and overlapping. Dyer and Ericksen (2009) studied organizational agility using the conceptual lenses provided by the complexity science, thus focusing on aspects such as interactions, self-organization, and co-evolution.

The achievement of agility is associated to a set of antecedents, such as cross-functional and external integration (Braunscheidel and Suresh, 2009), manufacturing distribution, partnership formation, concurrent engineering, integrated information systems, and electronic commerce (Gunasekaran, 1998). Along with the study of other facilitators and agility drivers, some studies attempted to present structures and practical approaches and methods for achieving agility. In such studies, the core concepts and research constructs associated to agility design and implementation may be identified. Baramichai, Zimmers Jr and Marangos (2007) proposed the *Agile Supply Chain Transformation Matrix* (ASCTM), a tool constructed

using quality function deployment (QFD) and the analytic hierarchy process (AHP) technique. According to the authors, the improvement of agile capabilities starts with the evaluation and identification of the business environment and changes occurring within the supply chain processes. The areas needing attention can be thus pinpointed by defining specific response strategies and approaches. The next stage is to identify the business practices and infrastructures that help enhance the company ability to respond to changes.

Preiss, Goldman and Nagel (1996) analysed four key steps that could lead the company to build agility. First, the organization needs to understand its business environment and changes taking place there. Second, the enterprise-level attributes should be identified in order to assess the internal enablers or impediments to actions in response to those changes. Third, the enabling infrastructure should be implemented to successfully approach agility. Fourth, business processes are recognised along with key actions required for the organisation in order to sustain its competitive advantage.

Sharifi and Zhang (1999) used a mixed research methodology to build a conceptual model of agility that consists of three main components, i.e. a) agility drivers and environmental changes; b) agility capabilities and organizational strengths supporting reaction; and c) agility providers, i.e. the means by which capabilities could be achieved at technology, people, organization and innovation levels. The analysis of agility drivers is preparatory to evaluating the company's current agility level and the expected or needed agility level. Assessment of agility gaps brings to four options, i.e.: 1) no need for the company to be agile; 2) the company is already agile enough; 3) the company needs to become agile but without urgency; and 4) the company needs to be agile fast and strong. Gap analysis and option definition are followed by a set of steps required to put agility into action, such as detection and analysis of changes, identification of required capabilities, strategy definition, definition of practices or initiatives useful to achieve capabilities, agility performance measurements, and correction actions. The agility methodology was further detailed and applied in successive studies (Sharifi and Zhang, 2001; Zhang and Sharifi, 2000) which have put a relevant focus on agility assessment, the drivers of agility needs, and the degree of agility required by each organization (desired agility).

Leybourn (2013) presented an agile business management approach that addresses four "domains" in which the organization needs to bring changes to achieve agility: a) role, responsibilities and modus operandi of the manager; b) relationship of the organization with customers; c) organisational context and human resources management; and d) tools and techniques to optimise workflows, exploit changes and manage customer requirements.

3. Method and Introduction to the Framework

The research was based on a design science approach, which is a pragmatic research paradigm that calls for the creation or examination of innovative artefacts to solve real problems (Hevner, March, Park and Ram, 2004). It includes the phases of problem identification, objectives definition, artefact development, solution demonstration, evaluation and research communication. Although design science was not extensively used in the strategic management literature, the "artefact-centric" approach (Ahmed and Sundaram, 2011) can be useful when the research is an attempt to design methodologies and tools to support business transformation, business model innovation and process management (Margherita, 2014).

The main goal of this article (answering to the research gap and the identified problem) is to design a structured framework describing the dimensions of organizational agility

development, with a twofold theory impact (system view of organizational agility) and practitioner impact (applicability of concepts into agility initiatives). The specific objective was to obtain a literature-based and practitioner-oriented checklist able to support discussion, action and evaluation of benefits concerned with agility adoption.

The design of the framework (artefact development) was based on a work of integration and systematization of extant literature, through three steps: a) selection of relevant articles on agility and agility development; b) extraction of agility-related constructs from identified articles; and c) aggregation and simplification of constructs into a single classification. The first step was to review literature to identify research works on agility. At this purpose, articles were selected from ISI WoK®, Scopus® and Google Scholar® databases by searching the keywords "business agility" and organizational agility" into article titles, so to exclude works investigating agility by a secondary or indirect perspective. A preliminary selection was made based on abstracts, so to ensure that all the selected articles were actually presenting or discussing approaches, methods or processes of relevance in terms of agility development. The second step was aimed to extract from selected papers all the constructs pointing to definitions, classifications, conceptual models and operational aspects of organizational agility. A list of all the extracted concepts was created to compare and eliminate duplicates and redundancies, and a final list of items was obtained which includes different groups of concepts.

One first group concerns the multiple *drivers* of *agility*, i.e. the determinants or factors of change that push the organization to adapt and reconfigure its strategy and operations in order to be agile. Second, extracted concepts refer to the *strategic goals* of an organization in terms if agility development and gap respect to the current level, along with options available and level of urgency. Third, several concepts are concerned with the *capabilities* of an organization and the strategic postures allowing the achievement of agility. Fourth, the review of literature allowed extracting concepts related to *technological enablers*, i.e. systems and infrastructures required for successful agility building. A fifth area concerns concepts associated to the *human resource* foundations of agility, i.e. people knowledge, skills and attitudes that enable, support or streamline the agility development effort. Sixth, literature has investigated the *processes* dimension of agility, i.e. the operational and implementation factors associated to the act of transforming the decision to go agile into pragmatic management actions. Finally, *performance and measures* are the focus of a group of specialized research papers determining the areas of success and critical measures of agility, also determining a scale of evaluation or maturity. Table 1 shows the key agility concepts with related literature references and focus areas.

Table 1. **Agility-related concepts and focus areas**

Agility-related concepts	Main References	Focus area
Change Factors, Drivers, Environmental Analysis, Organizational Factors	Gunasekaran and Yusuf, 2002 Gunasekaran, 1999 Hallgren and Olhager, 2009 Sherehiy, Karwowski and Layer, 2007 Yusuf, Sarhadi and Gunasekaran, 1999 Zhang and Sharifi, 2007	*External and internal drivers of agility*
Current Level, Desired Level, Exploitation, Exploration, Gap, Goal, Need, Option, Response, Strategy	Dove, 1999 Meredith and Francis, 2000 Sambamurthy et al., 2003 Sanchez and Nagi, 2001 Sherehiy, Karwowski and Layer, 2007 Zhang and Sharifi, 2007	*Agility strategy and goals*

Antecedents, Capabilities, Critical Success Factors, Competencies, Organizational Abilities, Prerequisites	Bottani, 2010 Braunscheidel and Suresh, 2009 Dove, 1999 Eshlaghy et al, 2010 Gunasekaran, 1998 Power, Sohal and Rahman, 2001 Sangari, Razmi and Gunasekaran, 2016 Sherehiy, Karwowski and Layer, 2007 Swafford, Ghosh and Murthy, 2006 Tseng and Lin, 2011 V´azquez-Bustelo, Avella and Fern´andez, 2007 Zhang and Sharifi, 2007	*Agility capabilities and competencies*
Enablers, Information, Information Systems, Infrastructure, Providers, Structures, Systems, Technology	McGaughey, 1999 Mondragon, Lyons and Kehoe, 2004 Overby, Bharadwaj and Sambamurthy, 2006 Sherehiy, Karwowski and Layer, 2007 Van Oosterhout, Waarts and Van Heck, 2006 Zhang and Sharifi, 2007	*Technology enablers of agility*
Authority, Education, Human Resource Practices, Intelligence, Motivation, Organizational Culture, Organizational Learning, People, Welfare, Workforce	Breu et al, 2001 Chan and Thong, 2009 Sherehiy, Karwowski and Layer, 2007 Zhang and Sharifi, 2007	*Human resource enablers of agility*
Actions, Business Processes, Collaboration, Cooperation, Coordination, Product Customization, Innovation, Integration, Plant Change, Project	Preiss, Goldman and Nagel, 1996 Raschke, 2010 Sharifi and Zhang, 1999 Sharifi and Zhang, 2001 Sherehiy, Karwowski and Layer, 2007 Upton, 1995 Zhang and Sharifi, 2007 Vokurka and Fliedner, 1998 Fliedner and Vokurka, 1997	*Processes for agility*
Adaptivity, Assessment, Feedback, Index, Market, Maturity, Measures, Performance, Proactivity, Product, Quality, Quickness, Resiliency, Responsiveness, Scale	Adarsh Kumar and Sekar, 2017 Charbonnier-Voirin, 2011 Li, Goldsby and Holsapple, 2009 Lin, Chiu and Chu, 2006 Tsourveloudis and Valavanis, 2002	*Agility performance and measures*

Next section describes how the seven groups of concepts have been aggregated into a structured framework of dimensions, sub-dimensions, and elements associated to agility development.

4. Framework of Organizational Agility Development

The review of literature has allowed to identify seven focus areas or dimensions in the study and implementation of organizational agility. These are: 1) external and internal drivers of

organizational agility; 2) agility strategy and goals; 3) agility capabilities and required competencies; 4) technology enablers of organizational agility; 5) human resource enablers of agility; 6) process innovation for agility; and 7) agility performance and measures. If agility development is considered as a broad management innovation and organizational improvement effort, the *plan-do-check-act* process (Deming, 1986) can be effectively adopted to frame and aggregate the focus areas or dimensions above. In such view, the dimensions 1-3 are related to activities addressed to establish a strategy for agility (*plan*). Dimensions 4-6 concern the implementation of the defined plan (*do*) and dimension 7 relates to the measurement of performance achieved in terms of agility building (*check*). When such performance does not meet the established goals, feedback actions (*act*) will be undertaken to redefine the strategy and/or the implementation of the same. Figure 1 shows a snapshot of the seven dimensions, grouped in three macro-areas. Next paragraphs describe in details the *Organizational Agility Framework*, starting from the identification of agility-related propositions derived from the analysed literature.
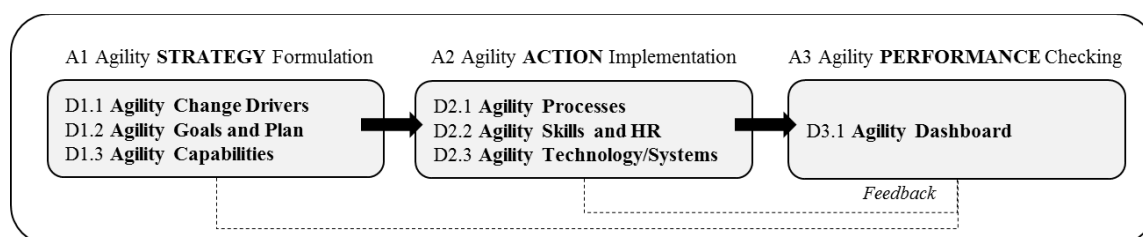

Figure 1. **Framework of Organizational Agility Development**

4.1. Agility Strategy Formulation

Strategy formulation is a crucial dimension of organizational agility building. The definition of the strategy allows the organization to undertake a course of action based on a clear understanding of "why" acting (rationale) and "what" to do, along with the assessment of the organizational preparedness to act. The first point is the analysis of the triggering factors or events that bring the company to develop agility. Literature shows that the decision to go agile may be driven by factors in the external environment (e.g. changing regulations, customer evolution, emergence of new technologies) as well as inside the organization (e.g. management innovation, international growth, product differentiation). Agility drivers can bring the company to a new position in running the business and searching for sustainable competitive advantage. Drivers can vary from one situation to another, and therefore the way they affect the organizations can vary as well. Example include changes in market, competition, customer requirements, technology, and social factors (Sharifi and Zhang, 1999; Sharifi and Zhang, 2001), as well as the differentiation strategy of the company and the competitive intensity of industry (Hallgren and Olhager, 2009), market positioning and product attributes such as life cycles and maturity stages (Zhang, 2011). Requirements of modern manufacturing also set an agenda for agility building and include automation and price/cost consideration, widening customer choice and expectation, competitive priorities, integration and proactivity and achieving manufacturing requirements in synergy (Yusuf, Sarhadi and Gunasekaran, 1999). The identification of agility drivers is a concern for key organizational roles such as business analysts and functional managers (e.g. HR, IT, Marketing, Operation, R&D) who are able to obtain key industry and market information as well as integrated company data documenting the trends that determine the strategic need for the organization to pursue agility. The

organization will thus have to "sense" changes or transformation drivers and integrate the same into a systemic rationale for agility. The following proposition can be formulated:

- *P1.1: A number of environmental and internal factors will bring the organization to undertake an agility development initiative aimed to defend or enhance its competitiveness.*

The analysis of driving factors will support the generation of the agility strategy of the organization. At this purpose, companies may have a different orientation in terms or reacting or defining a deliberate proactive approach to innovation and agility. Each organization has its own perspective about reacting to or anticipating changes and the response strategy will thus be different for every single company. The development of agility can be in fact a "reaction" to the changing and uncertain business environment or a deliberate change through leadership change, reengineering, innovation in products and processes, or technology adoption. In this perspective, quick, responsive and proactive agility strategies can be defined (Zhang, 2011). Moreover, the desired level of agility is a crucial variable to set when defining the response strategy and an expected target scenario. Strategy identification is influenced by different factors associated to the specific supply chain strategy and type of products (Fisher, 1997). Critical success factors are of relevance as they represent the determinants of success into the specific organizational context. The company top management, along with IT and operations managers are crucial stakeholders in such planning effort, with the main goal to come up with a comprehensive manifesto of agility strategy design. The following proposition can be formulated:

- *P1.2: The organization will define a proper reaction or deliberate action strategy in response to change drivers, and will define specific goals to achieve in terms of agility development.*

Strategy definition should be complemented with the assessment of where the organization stands in terms of the capabilities required to go agile, and consequently in terms of extant and missing capabilities at both individual and organizational level. Agility is a business-wide ability that embraces organisational structures, information systems, logistics processes and mindset (Christopher and Towill, 2000). Once the organization has recognised the level of its agility needs, the assessment should be addressed to estimating the current strengths and abilities, with options being no need to be agile, current agility is enough, need to become agile in the long term, and urgent need to become agile. Agility comprises two distinct capabilities, sensing and responding (Roberts and Grover, 2012), and four major categories of capabilities required to respond to changes. These capabilities are responsiveness (ability to identify and respond fast to changes), competency (abilities that provide productivity, efficiency, and effectiveness of activities), flexibility (ability to process different products and achieve different objectives with the same facilities) and quickness (ability to carry out tasks and operations in the shortest possible time) (Sharifi and Zhang, 1999). Key functional managers (HR, IT and operations) are crucial roles into the effort of determining the potential of the organization in achieving the expected results and the associated points of strength and weakness and. The following proposition can be formulated:

- *P1.3: The feasibility and realization of the agility strategy rests on a combination of individual and organizational skills and operational capabilities to put in action.*

Table 2 synthesizes the three propositions related to *Agility Strategy Formulation*, and translates the same into agility strategy dimensions and associated strategy elements derived from the conceptual extraction work (Table 1).

Table 2. **Dimensions and elements of Agility Strategy Formulation**

Dimensions	Elements
D1.1 **Agility Change Drivers**	**1.1.1.** Market and competitive/industry factors **1.1.2.** Innovation dynamics and technology trajectories **1.1.3.** Value chain/network drivers of change **1.1.4.** Socio-political and normative trends **1.1.5.** Internal/organizational aspects and change factors
D1.2 **Agility Goals and Plan**	**1.2.1.** Company priorities and business goals **1.2.2.** Level of agility need and requirement **1.2.3.** Type of strategy for action **1.2.4.** Target agility scenario **1.2.5.** Critical success factors
D1.3 **Agility Capabilities**	**1.3.1.** Techno-organizational requirements for agility **1.3.2.** Value network and company capabilities **1.3.3.** Capability gaps to fill **1.3.4.** Actions for gap filling

4.2. Agility Action Implementation

The second macro-area of themes associated to agility development is implementation, i.e. the practical execution of the defined agility strategy/plan. Strategic objectives are thus translated into actions, with the purpose to determine the practices or initiatives required to achieve capabilities, to measure and evaluate agility performance, and to make correction based on results (Sharifi and Zhang, 1999). The first element to address is the innovation or redesign of extant processes in the perspective of enhancing organizational agility. Process changes may be crucial drivers or barriers to agility building at different levels of the organization (e.g. manufacturing, marketing, design, organization, and general management). Agility affects the aptitude of a firm in managing its internal operations and interactions with its eco-system, and it includes customer agility, partnership agility and operational agility. While the first two deal with managing relationships, operational agility refers to the ability to rapidly redesign existing processes (Sambamurthy, Bharadwaj and Grover, 2003). Generally speaking, business process agility is the ability to dynamically reconfigure and/or deploy a business process to accommodate emerging business needs and it includes aspects such as responsiveness, re-configurability, employee adaptability, and a process-centric view (Raschke, 2010). Examples of actions undertaken to achieve agility are improving response time, continuous improvement, developing JIT, cellular manufacturing, problem-solving techniques, reducing time-to-market, re-engineering processes, and investment to increase quality (Sharifi and Zhang, 2001). Key organizational roles associated to this sub-dimension are BPM responsible and operations

manager, in connection with HR and IT managers. The following proposition can be formulated:

- *P2.1: Agility development implies adapting, innovating or completely redesigning business processes in order to achieve the established goals.*

However, the agility-oriented process reconfiguration of redesign is not sufficient to ensure effective implementation of the agility strategy. Two other areas of intervention are in fact needed in relation to developing the required human resource competencies and skills, and adopting or developing the enabling technology systems and applications. First, people competencies and skills are to be developed with the purpose to achieve agility goals. In particular, starting from the organizational diagram and the core organizational roles, the effort is to develop a family of core agility-related or agility-relevant knowledge, skills and attitude into employees and managers. Breu et al. (Breu, Hemingway, Strathern and Bridger, 2001) identified ten key attributes of an agile workforce that are grouped into five capabilities, i.e. intelligence, competencies, collaboration, culture, and information systems. Studies have been also conducted to define conditions for acceptance of agile methodologies (Chan and Thong, 2009). Eshlagy et al. (Eshlaghy, Mashayekhi, Rajabzadeh and Razavian, 2010) identified 12 factors that have an effect on organizational agility and the most significant are leadership, organization commitment, and job satisfaction (whereas typical manufacturing issues play a less important role). Employees' role and competency are among the most relevant attributes and factors for the definition of an agile company (Bottani, 2010). Four policies/practices are adaptable structures, multi-skilled and flexible people, rapid decision-making and continuous learning (Meredith and Francis, 2000). A key organizational role associated to this sub-dimension is the HR manager, in connection with BPM responsible, operations, IT and HR managers. The following proposition can be formulated:

- *P2.2: The agility mindset and skills of people in the organization should be developed in order to ensure effective and efficient implementation of agility-related actions.*

Finally, agility implementation requires the adoption, adaptation or purposeful development of technology systems and technology-based services and applications. The support and enabling role of information systems, IT systems and technology infrastructures for enterprise agility has been largely studied in literature (Overby, Bharadwaj and Sambamurthy, 2006; Weil, Subramani and Broadbent, 2002). Agile information systems are crucial as they have the ability to add, remove, modify, or extend functionalities, to process information in a flexible manner, and to accommodate and adjust to the changing needs end-users (Desouza, 2006). Information system integration influences firm performance through network agility, and mixed channel strategy boosts financial performance (Chen and Chiang, 2011). Although crucial, information systems in themselves are not sufficient to achieve agility in business processes (Mondragon, Lyons and Kehoe, 2004) and many management enablers are required. A predictive model explaining the impact of information system capabilities on organizational agility is present in literature (Felipe, Roldán and Leal-Rodríguez, 2016) and other contemporary studies of business agility are focused on the use of intelligent information systems to support fast decision making and actions, e.g. for corporate reputation and active social media sensing (Seebach, Beck and Denisova, 2013). Always with a technology focus, a work has been addressed to discuss the implications of control architectures and IT systems in improving (or impeding) business agility and velocity (Harkins, 2016). One key organizational

role associated to this sub-dimension are IT manager, in connection with the company CTO, BPM responsible, operations, IT and HR managers. The following proposition can be formulated:

- *P2.3: Agility implementation is enabled by the development of technologies and systems aimed to ensure the agility of processes and organizational dynamics.*

Table 3 synthesizes the three propositions related to *Agility Action Implementation,* and translates the same into agility strategy dimensions and associated strategy elements derived from the conceptual extraction work (Table 1).

Table 3. **Dimensions and elements of Agility Action Implementation**

Dimensions	Elements
D2.1 **Agility Processes**	**2.1.1.** Business process diagrams **2.1.2.** Redesign processes for agility purposes **2.1.3.** New activities and practices for agility **2.1.4.** Integrated and improved processes
D2.2 **Agility Skills and HRM**	**2.2.1.** Organization diagram and structure **2.2.2.** Competencies and skills for agility **2.2.3.** Agility building special teams
D.2.3 **Agility Technology/Systems**	**2.3.1.** Digital and IT solutions for agility **2.3.2.** Integrated architecture and platforms **2.3.3.** Lean production technologies **2.3.4.** Technology set-up projects

4.3. Agility Performance Checking

The third macro-area of themes associated to agility development is performance assessment, i.e. the identification of measures and KPIs to assess the efficiency and effectiveness of the agility building initiative. This allows to verify if the resulting performance is satisfying or not and to undertake according the proper decisions and actions (feedback – act). Rrecent researches (Chiang et al, 2016; Liu et al, 2013; Tse et al, 2016; Um, 2016) investigated the direct relationship between (supply chain) agility and firm performance and showed how the integrated use of agile manufacturing practices promotes manufacturing competitive strength, leading to better operational, market and financial performance (V´azquez-Bustelo, Avella and Fern´andez, 2007). The mediating role of organizational agility was also found between knowledge management and organizational performance (Cegarra-Navarro, Soto-Acosta and Wensley, 2015). If a relation exists, the problem here is what measuring and how. At this regard, different contributions have been proposed to "measure" agility which use fuzzy index (Tseng and Lin, 2011; Lin, Chiu and Chu, 2006) and multi-dimension scale development (Li, Goldsby and Holsapple, 2009; Swafford, Ghosh and Murthy, 2006). The measurement effort should be addressed to identify financial consequences of being agile in terms of cost efficiency, customer effectiveness and overall financial performance (Gligor, Esmark and Holcomb, 2015). A detailed hierarchical structure of KPI is identified and ranked using BSC (Balance Scorecard) by Nejatian and Zarei (2013). In order to calculate agility, a set of

quantitatively defined agility parameters is proposed and grouped into production, market, people and information infrastructure (Tsourveloudi and Valavanis, 2002). Key organizational roles associated to this sub-dimension are HR manager, in connection with BPM responsible, company CFO, operations manager, IT and HR managers. The following proposition can be formulated:

- *P3.1: A comprehensive dashboard of performance measures will allow the organization to evaluate the impact of agility development and to fine-tune strategy and actions accordingly..*

Table 4 synthesizes the proposition related to *Agility Performance Checking* into a single agility dimension, and associates to the same a number of specific elements derived from the conceptual extraction work (Table 1).

Table 4. **Dimension and elements of Agility Performance Checking**

Dimension	Elements
D3.1 **Agility Dashboard**	**3.1.1.** Performance areas and KPIs **3.1.2.** Integrated agility scorecard **3.1.3.** Agility maturity **3.1.4.** Goal/results gaps and improvements **3.1.5.** Feedback actions and key points

5. Discussion and Conclusions

Organizations are increasingly concerned with uncertainty and unpredictability within their environment and this puts a pressure on their ability to capture and react to external changes, i.e. on their organizational agility. Organizational agility is a cornerstone of competitiveness and it can be advocated as the business paradigm of the 21st century and the dominant vehicle for competition (Zhang and Sharifi, 2007). However, there are no generic formulae for agility creation since organizations experience different sets of changes. Besides, the decision on being or not agile, along with the degree of desired agility, can be influenced by a number of aspects which are placed inside or outside the organization. Among the "internal" factors, the company business model and organizational structure can influence the approach to agility development. Outside the organization, the characteristics and complexity of the supply chain, the competitive dynamics, and the turbulence caused by technology innovation are factors affecting the decisions and actions of the company about agility.

Prescriptive approaches may thus be of limited relevance and applicability whereas general-purpose frameworks can be more useful to support management decisions and actions into agility-related initiatives. Extant literature on organizational agility has investigated specific perspectives or dimensions associated to strategic management, supply chain management, operations management and information systems. This article aims to overcome the absence of a holistic or integrative model of organizational agility development, by introducing the *Organization Agility Framework*. The *Framework* is an attempt to provide a canvas of crucial dimensions associated to *strategy formulation* (changes factors, strategy and requirements), *action implementation* (operational accomplishment at process, human and technology level) and *performance checking* (KPI design, monitoring, feedback actions) of agility building.

The *Framework* adds to the plethora of extant research on organizational agility an attempt

to provide a systematization of key constructs along the agility building idea. The system perspective of agility development as integration of dimensions can stimulate new cross-disciplinary studies focused on the complex techno-organizational design associated to agility. In such perspective, the model provides an answer to the first and third questions formulated in the introduction (i.e. what are the critical factors for a successful agility development effort?; how the multi-faceted aspects of organizational agility may be integrated into a unified model?). Concerning the second question (how agility should be defined and determined for specific requirements of organizations?), the model is a general framework or a management canvas which has to be adopted and adapted according to the specific needs and characteristics of the organization. By a practitioner perspective, the main value added of the article stays in proposing a comprehensive checklist of key elements involved in agility building, with a potential support that can be identified at three main levels. i.e.: 1) *business intelligence*; 2) *collaborative action*; and 3) *systemic improvement*.

How can the organization improve knowledge while engaging itself into an agility development initiative? The answer stays in the effort needed to understand, capture and systematize drivers of change, which are outside the organization, along with the analysis of internal strengths and weaknesses. Agility development requires the ability to scan industry and market in search for determinants or barriers of change and to integrate the different dimensions of agility within the overall organizational performance. The *Framework* presented can support the development of *business intelligence* by providing: a) a canvas for organizational and market analysis, with the identification of crucial aspects to monitor for the purposes of agility design and implementation; and b) a template for agility-related knowledge management, with a structure of dimensions and sub-dimensions useful to construct a taxonomy of strategic data and information collected or created to support agility building.

The second area of potential support is related to *collaborative action*. The achievement of agility should be based on a collaborative mindset and a structured and shared approach to company operations. In fact, one distinguishing aspect of agility building is that it concerns different dimensions of the organization. Although operations and IT aspects are prevailing, building or improving agility competencies has an impact on dimensions such as human resource management and financial management. Besides, while engaging itself into the different strategic and operational dimensions of agility building, the organization is stimulated to develop a mature approach to project planning and management. The *Framework* can support collaborative action for the purposes of agility building by providing: a) a structured and literature-based checklist and guiding principles for cross-functional interaction to achieve agility; b) an organization-wide view and awareness of the importance of systematic actions and a project (management) perspective to achieve the goals established.

Finally, the *Framework* can support a view of continuous management innovation and organizational maturity, in which agility is one of different methods and techniques to improve the overall organizational performance. In fact, the achievement of agility is part of a larger, pan-organizational effort aimed to bring improvement or radical innovation to systems and sub-systems. The support is thus in terms of terms of *systemic improvement*, by providing: a) emphasis towards a continuous improvement mindset within a strategy-action-performance cycle; and b) awareness about the importance of aligning IT, human resource management and operations-related aspects.

One main limitation affects the article. Although the *Organizational Agility Framework* offers a comprehensive view of agility development dimensions into the organisation, all the components of the model should be better detailed in order to define more fine-grained aspects. In particular, the conceptual relations existing among the three dimensions and the seven sub-

dimensions should be better analysed and discussed. The ultimate goal would be to obtain a semantic model of organizational agility, in which the static or taxonomical approach to representing components and sub-components is developed into a dynamic conceptual model of organizational agility.

Next research will be addressed to conduct a survey with functional managers (mostly HR, IT and operations manager) and experts of organizational agility, with the main purpose to submit the agility development model and obtain a validation of the concept and the elements defined, along with a feedback for further refinement and practical application into real agility development projects. This activity will thus allow to complete the design science path through demonstration and evaluation of the framework.

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