

The contribution of systems and service research to rethinking higher education programs: a T-shaped model¹

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Abstract

Purpose of the paper: Building upon the advancements in knowledge proposed by the research stream about the “T-shaped professional”, the paper aims to investigate the opportunities and key factors of rethinking traditional education models and programs by exploring the contribution of service research in the field of education through the interpretative lens of systems thinking.

Methodology: The paper traces a wide conceptual framework rooted in systems thinking and service research with the intent of highlighting the contribution of a T-shaped view in higher education programs. The proposed conceptual arguments are then tested through the analysis of the Master’s Degree program in Service Science, Management and Engineering (SSME) of the Masaryk University in Brno (Czech Republic).

Results: The paper proposes basic arguments for the development of a T-shaped model in higher education programs and empirical evidence concerning the possibility of implementing an effective T-shaped approach based on systems thinking in order to rethink higher education programs.

Practical implications: The paper provides a path to combine traditional hyper-specialized knowledge with more dynamic and cross-sectional capabilities in higher education programs.

Originality of the paper: A wide perspective about the “T-shaped professionals” as a possible reference model in which vertical expertise is combined with horizontal capabilities and cross-sectional knowledge is proposed in the light of Systems Thinking and Service Research.

Key words: Education models; multi- and trans-disciplinary knowledge; systems thinking; service research; T-Shaped professionals.

1. Introduction

Nowadays, the increasing complexity of social and economic dynamics is pushing both researchers and decision makers to search for new models, approaches, and instruments to better understand and face new challenges (Holling, 2001). Old approaches and perspectives are proving useless in supporting organizations in defining efficient, effective, and suitable managerial pathways and strategies (Boyatzis, 2006).

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Building on these reflections, various authors have tried to identify requirements to enrich the set of knowledge, competences, and capabilities of organizations with new, more performant instruments (Allee, 1997; Yang, 2010). Several authors have focused their attention on the relationship between providers and users (Ravald and Grönroos, 1996), others have pointed to the role of organizational models in ensuring a more efficient and effective use of available resources (Pfeffer and Salancik, 2003), and to the contribution that Information and Communication Technologies can offer in terms of better acquisition, documentation, and application of the knowledge required to manage social and economic dynamics (Malecki, 1997).

Despite the advancements in knowledge offered by all these contributions, they appear to pivot mainly on the individual dimensions of company pathways and behaviours (relationships with the market, use of resources, knowledge management etc.). In addition, a holistic approach that is necessary to support organizational behaviours in facing emerging social and economic dynamics is still missing (Burnes, 2004).

Growing social and economic complexity can be interpreted as the consequence of the increasing interconnection between different dimensions, perspectives, and aims (Savory and Butterfield, 1998). This reveals the inadequacy of traditional hyper-specialized knowledge in supporting the effective understanding of dynamics as a whole (McMillan, 2008), and underlines the need to improve the capability of organizations and people to link different social and economic dimensions to a common interpretative path (Del Giudice *et al.*, 2016). Accordingly, a wider perspective inclusive of different hyper-specialized contributions and approaches is required to understand the multiple dimensions engaged in the construction of complexity (Barile *et al.*, 2015c).

In order to bridge this gap, the paper aims to enrich previous contributions regarding the management of emerging social and economic challenges by focusing on the role of human resources in understanding and managing the multi-faceted nature of complexity (Jackson and Schuler, 1995). More specifically, the work aims to investigate the following research questions: 1] *How can Human resources support organizations in understanding and managing social and economic complexity?* 2] *What competencies, capabilities, and knowledge are human resources required to face emerging social and economic challenges?* 3] *Is it possible to define a common shared approach to train human resources to manage increasing variety?*

The structure of the paper is as follows: after this introduction, in section 2, a description of the theoretical and conceptual background underpinning our reflections is briefly presented. In section 3, a conceptual model devised to support the emergence of multi- and trans- disciplinary education programs is proposed. In section 4, the potential contribution of a change in perspective in higher education programs is discussed with reference to the case of the Master's Degree program in Service Science, Management and Engineering (SSME) of the Masaryk University in Brno (Czech Republic). Finally, in section 5 some concluding remarks and future lines of research are outlined.

2. Theoretical and conceptual background

2.1 *The need for a multi- and trans-disciplinary approach in education*

Over the last twenty years, increasing pressures imposed by social and economic changes such as globalization, the evolution in consumer lifestyle, and increasing peer to peer information sharing, have profoundly affected companies' strategies and behaviours (DeLanda, 2006). Many companies have perceived such emerging dynamics as a risk for their market shares and have tried to defend their position by focusing their attention on very specific activities and processes (Doyle and Saunders, 1985).

In such a context, specialized human resources endowed with specific knowledge in delimited domains (Miles and Snow, 1984) were required. Following market demand, public and private 'educators' have started to build more specialized learning pathways addressed to improving people's capabilities to analyze, understand, and manage all the specific dimensions of particular processes and activities (Ulrich, 1997). According to Baird and Meshoulam (1988), the tangible evidence of this trend may be seen in the emergence of the hyper-specialized, knowledge- based society in which we all live.

The opportunities and advantages offered by specialized learning pathways and human resources have been analyzed by various research communities and in accordance with multiple viewpoints (Lepak and Snell, 1999). According to Torraco and Swanson (1995), specialized knowledge offers human resources the opportunities to solve companies' problems more quickly. Similarly, Porter (1990) outlines that the in-depth knowledge of the dimensions of social and economic phenomena is the most efficient way to support organizational strategies and plans. Alchian and Demsetz (1972) furthermore show that there is a strong correlation between the hyper-specialized knowledge of human resources and companies' economic performance. Finally, Kakabadse *et al.* (2003) underline - via a systematic literature review - the growing attention of researchers and decision makers in identifying suitable pathways to improve the specialized knowledge of human resources.

Despite the evidence and advancements in knowledge that have been offered by these contributions, emerging dynamics are showing the incapacity of traditional hyper-specialized models to offer suitable solutions in facing many social and economic challenges (Kline, 1995) that are still in search of solutions. According to Shiva (1987), models and approaches based on such knowledge are not able to support organizational processes and strategies in facing emerging challenges for two main reasons: 1] the overlapping of dimensions, pathways, and resources hinders the identification of individual variables to which specialized knowledge is to be applied, and 2] the rapidity in change of social and economic dynamics renders approaches based on studies of individual dimensions and their connection futile and untenable.

In reflecting on these considerations, some researchers have started to underline the need to devise a more holistic view of social and economic

phenomena in order to understand them (Gummeson, 1991; Giddings *et al.*, 2002). Building on the interpretative contribution offered by eminent thinkers such as Kuhn (1962), von Bertalanffy (1971), Lovelock (1972), Bohm (1980), and Capra (1996), other researchers have started to highlight the need for wider interpretative approaches (Tichy and Devanna, 1986).

Over the last few years, an increasing number of contributions, ideas, and perspectives have attempted to shift the attention from a reductionist to a holistic view (Mele *et al.*, 2010; Golinelli *et al.*, 2012; Saviano and Caputo, 2012, 2013). Furthermore, various research streams have underlined the need to frame multi- and trans-disciplinary approaches to face emerging challenges (Wagner *et al.*, 2011), and some organizations have changed their approaches and structures to build wider cross-cultural pathways (Van Der Vegt and Bunderson, 2005).

In this emerging pathway addressed to supporting ‘holistic organizations’, human resources are key drivers on which to ‘act’ to build new perspectives for the management of future organizations (Gupta and Singhal, 1993). More specifically, the ways in which human resources are educated and trained represent a potentially suitable pathway to improve the efficiency, effectiveness, and sustainability of future generations of companies (Schuler, 1992).

2.2 Directions from system thinking in defining a multi- and trans-disciplinary education approach

The topics of human knowledge and learning processes are some of the most debated from different viewpoints in managerial, psychological and sociological studies (Stacey, 2001). Among the contributions offered in such domains, an interesting advancement in knowledge was made by Bloom *et al.* (1956), with reference to the possible classification of cognitive levels in learning processes.

According to the authors, every learning process can be divided into the following levels, classified from the simplest to the most complex: 1) Knowledge, 2) Comprehension, 3) Application, 3) Analysis, 4) Synthesis and 4) Evaluation (see Table 1).

Tab. 1: The levels of Bloom’s taxonomy

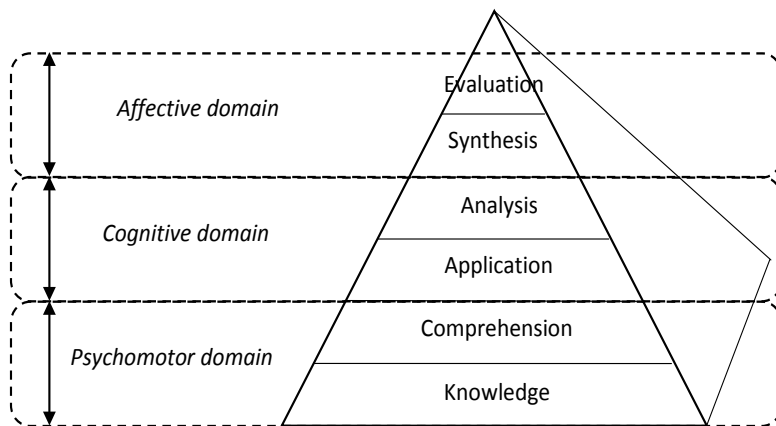
Bloom’s taxonomy	Description
Knowledge	Refers to the acquisition of information related to experiences lived and/or actions carried out.
Comprehension	Refers to the ability to understand the meaning of information acquired from the context.
Application	Is related to the ability to use acquired information in different contexts or situations.
Analysis	Concerns the ability to break down available information into their essential parts.
Synthesis	Refers to the capabilities to combine available information in new conceptual frameworks and mental models.
Evaluation	Is related to the capabilities to evaluate the usefulness of specific information and knowledge in solving different problems or in understanding different scenarios.

Source: Adapted from Bloom *et al.* (1956)

Bloom *et al.*, moreover, identified three domains that are involved in each learning process: 1) Psychomotor, 2) Cognitive, and 3) Affective. By combining these contributions, it is possible to define a conceptual framework that is useful in investigating each kind of learning process while adopting a holistic perspective (see Figure 1).

Marialuisa Saviano
 Francesco Polese
 Francesco Caputo
 Leonard Wallezky
 The contribution of systems and service research to rethinking higher education programs: a T-shaped model

Fig. 1: A representation of learning processes in light of Bloom's levels and domains



Source: Adapted from Bloom *et al.* (1956)

Reflecting upon the proposal of Bloom *et al.* (1956), it is possible to notice that education approaches based on the development of hyper-specialized knowledge primarily impact the Psychomotor domain, while they offer few contributions with reference to the management and implementation of the other two domains in higher complexity contexts. In this respect, Banathy (1991) outlines that there are five main reasons that confirm the inadequacy of hyper-specialized education models in supporting the management of complexity: 1) the incremental approach, 2) the poor integration of solutions and ideas, 3) the prevalence of a discipline based approach, 4) the reductionist view, and 5) the inability to see beyond the existing system.

In order to bridge these gaps, a potential path to define how education programs should evolve to support the improvement of human resources' cognitive and affective domains is offered by the systems thinking approach (Beer, 1985; Espejo, 1994; Checkland, 1999; Golinelli, 2010; Barile and Saviano, 2011; Barile *et al.*, 2012). As highlighted by Senge *et al.* (1994), the systems thinking approach has overcome the boundaries of the reductionist view, enabling a different way of perceiving and interpreting the world. Accordingly, Kim (1995) underlines that systems thinking highlights the relevance of the connection between the parts in understanding the whole. Recognizing the potential contributions that system thinking could offer in the domain of educational programs, a useful interpretative support is that of the Viable Systems Approach (VSA) (Saviano *et al.*, 2017a). More specifically, according to VSA directions, every system (organization, company, people, etc.) can be analyzed as an

Information Variety (Barile, 2009), which is a combination of information units, interpretation schemes, and categorical values (Barile and Saviano, 2010) (See Table 2).

Tab. 2: VSA levels

VSA levels	Description
Information Units	“Information units represent the ‘structural’ composition of knowledge that is the amount of data owned by the viable system including all that it can perceive or can further determine by processing and transforming into information significant to the knowledge process”.
Interpretation Schemes	Interpretative schemes represent knowledge patterns and refer to how information is organized within the viable system’s whole variety. Without such logical interpretation schemes, every piece of information would appear new to the systems every time we perceive it and, consequently, the system would need to create a new interpretative model to explain and understand it every time”.
Categorical Values	“Categorical values represent the most relevant dimension of the information variety and qualify the viable system’s values and strong beliefs, defining the system’s identity. Categorical values are responsible for accepting/refusing rational elaborations and determining the functioning of interpretative schemes. They act by subjectively filtering incoming information in the interaction process”

Source: Barile and Saviano (2013): 46-47

This representation appears aligned with the domains of learning processes (psychomotor, cognitive, and affective) identified by Bloom *et al.* (1956), it also outlines potential directions for building holistic educational programs, and for supporting the identification of a potential knowledge taxonomy (see Table 3).

Notwithstanding the possible advancement pathways in knowledge suggested by our considerations, other questions are still open with reference to how a more holistic education approach could support people in facing challenges imposed by emerging complexity (Barile and Saviano, 2017). In this respect, it should be underlined that individual knowledge, competences, and capabilities are not enough to manage the various dimensions involved in social and economic dynamics (Barile and Polese, 2010; Barile *et al.*, 2012). Following this line of reasoning, we should investigate how it is possible to combine different forms of knowledge, competencies, and capabilities to face social and economic challenges (Barile *et al.* 2013; Saviano *et al.*, 2016). In this respect, recent advancements in service research seem to offer potential contribution. Accordingly, the following subsection investigates the potential contribution of service research to the emergence of a multi- and trans-disciplinary education approach.

Tab. 3: Directions from vSA to manage Bloom's domains

Marialuisa Saviano
 Francesco Polese
 Francesco Caputo
 Leonard Wallezky
 The contribution of systems
 and service research to
 rethinking higher education
 programs: a T-shaped model

Bloom's domains	vSA levels	Directions from vSA	vSA's knowledge taxonomy
Psychomotor	Information Units	The improvement of the psychomotor domain requires the acquisition of knowledge and information about the phenomenon and the actions to be managed. It requires support of information sharing and knowledge acquisition.	<i>Intellectual knowledge</i> Refers to the information set on which decisions and strategies are based (Machlup and Leeson, 1979).
Cognitive	Interpretation Schemes	The improvement of the cognitive domain requires the building of mental models and conceptual frameworks that are capable of supporting the links between various available knowledge. It acts on the organization of information through knowledge documentation and the building of mental maps.	<i>Epistemological knowledge</i> Acts in the case in which it is necessary to combine different kinds of information in order to build new pathways to face unknown problems (Perkins, 1993).
Affective	Categorical Values	The affective domain involves in-depth social and psychological dimensions. It identifies strong beliefs on which to act to build individual identity and identify aligned profiles with which to interact.	<i>Sensorial knowledge</i> Influences the ways in which individuals make sense of the external world as a consequence of their perceptions (Parr, 2010).

Source: Authors' elaboration

2.3 The contribution of service research to the emergence of a multi- and trans-disciplinary education approach

The education domain is one of the most discussed service fields both in managerial and marketing studies (Metcalf, 2005). Over the last few years, a growing number of researchers have analyzed it from different viewpoints as a consequence of the increasing relevance of the service perspective (Schneider and Bowen, 1993; Hill, 1995; Sallis, 2014; Polese *et al.*, 2016; Saviano *et al.* 2017b).

As pointed out by Ng and Forbes (2009) the education field is an a-typical service domain, given that the perceived value of education is hard to define and that there is no direct link between the cost of the service and its benefits.

Despite this, research streams based on service logic can offer interesting contributions in the definition of education programs capable of better capturing and facing challenges imposed by emerging social and economic complexity (Foropon *et al.*, 2013). From this perspective, Lusch and Vargo (2014) outline that society can be analyzed in terms of entities that are interconnected to share knowledge, competences, and capabilities to build more efficiency, effectiveness, and sustainable solutions to satisfy market needs. Accordingly, one of the most relevant challenges in the building of efficient, effective, and sustainable solutions is the definition of

pathways capable of supporting the sharing of knowledge, competences, and capabilities (Akaka *et al.*, 2012; Di Nauta *et al.*, 2015; Caputo *et al.*, 2016; Lusch *et al.*, 2016).

To achieve this aim, as underlined by Lawson (2004), a shared language capable of supporting relationships among human resources endowed with different kind of knowledge, competences, and capabilities requires defining. Moreover, the building of a shared language also requires the identification of shared norms (Lawson and Briar-Lawaon, 1997; Calabrese *et al.*, 2013; Saviano *et al.*, 2014) and conceptual frameworks (Lawrence, 2015; Evangelista *et al.*, 2016).

Considering the above, traditional hyper-specialized education programs demonstrate all their uselessness as they pivot on the building of sectorial knowledge and languages (Hefley and Murphy, 2008). At the same time, the few existing studies on the implementation of multi- and trans- disciplinary education programs show their relevant benefits in terms of learners' capabilities to better understand problems related to different topics (Wicklein and Schell, 1995), to communicate more easily and to share information with colleagues in order to find better solutions (Glushko, 2008) and more rapid problem solving techniques capable of covering the multiple dimensions of a specific problem (Coyle *et al.*, 2006). In addition to relevant advantages, these studies also point out some obstacles in building multi- and trans- disciplinary education programs related to: 1] the definition of shared learning processes (Brown, 1991), 2] the professional identity of students with knowledge based on different topics (Eylon and Linn, 1988), and 3] opportunities to apply multi- and trans- disciplinary knowledge in a society that is strictly related to the reductionist view (Ng *et al.*, 2011).

In light of such considerations and in adopting the interpretative lens offered by a service logic, a relevant issue needs to be investigated, given the emerging need for multi- and trans- disciplinary approaches, i.e. *value co-creation*. According to Vargo *et al.* (2008), value co-creation emerges as a consequence of the interaction between the different entities that share reciprocal knowledge, competences, and capabilities and define common solutions to their reciprocal satisfaction. The application of this proposition to the domain of multi- and trans-disciplinary education programs requires investigating a relevant question: *how is it possible to support interactions between people endowed with different specialized knowledge, languages and perspectives?*

To offer a potential answer to this question, which can also contribute to understanding how a person can effectively integrate knowledge deriving from different domains, the next section investigates the conceptual framework of the 'T-shaped' model in the light of systems thinking and service logic as a potential contribution to rethinking education programs.

3. A potential model for rethinking education programs

Among the various theoretical and empirical contributions offered to build education programs that are better able to face the challenges

imposed by emerging complex dynamics, the promising research stream on the “T-shaped” model is attracting interest among scholars from several disciplinary domains (Hansen and Von Oetinger, 2001; Enders and de Weert, 2009; Spohrer *et al.*, 2010).

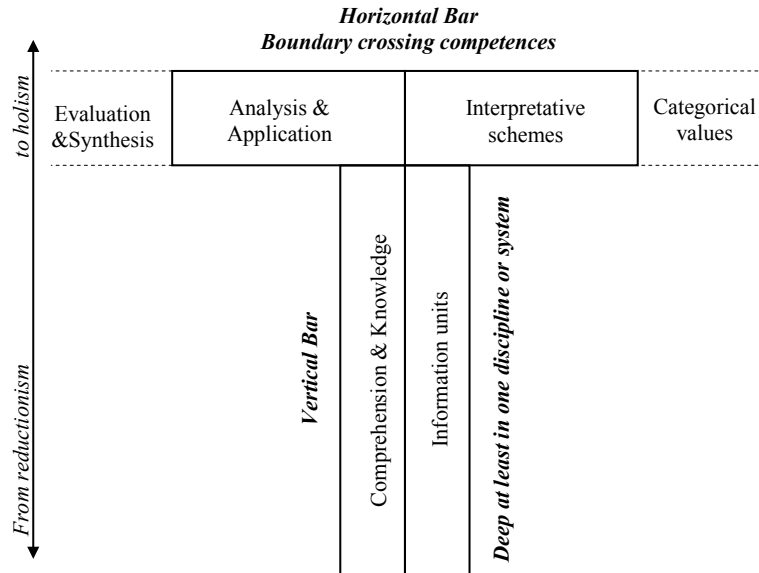
The concept of “T-shaped people” was introduced by David Guest (1991) to describe a professional profile that is “equally comfortable with information systems, modern management techniques and the 12-tone scale” (p. 12). Building on this first contribution, an increasing number of studies have started to investigate the opportunities related to “T-shaped people” or “T-shaped professionals” as human resources capable of combining in-depth vertical knowledge in specific fields, disciplines or systems with horizontal capabilities in an attempt to shift between them (Spohrer and Maglio, 2010). Various contributions have investigated the differences between “I-shaped” profiles - built by actual education programs - and the “T-shaped” profiles required to face emerging social and economic complexity (Donofrio *et al.*, 2010). Advantages related to the opportunity for the emergence of “T-shaped” people have been analyzed from diverse viewpoints both for organizations (Coates, 2012) as well as for society (Rust *et al.*, 2010). Some contributions have also been offered with reference to the potential measure of “T-shaped” people and professionals focusing on their experience and knowledge (Glushko, 2008). Finally, updates were proposed in terms of π -shaped knowledge, which is generated by the interaction among different t-shaped profiles (Barile *et al.*, 2012). However, despite such progress in knowledge, a shared approach to its implementation and application is still missing (Fisk and Grove, 2010).

In order to bridge this gap, the paper proposes to act on education programs as a way to support the emergence and the building of T-shaped profiles. Adopting the interpretative lens offered by system thinking and service logic, it is possible to highlight that the emersion of T-shaped profiles requires a change in the kind of knowledge on which education programs should be based. In terms of the proposed Information variety model, what is missing is the capability of performing effective integration of variety when dealing with very different, variable and unpredictable problems. This approach implies shifting attention from the level of information to the levels of interpretation schemes and categorical values where knowledge is structured in deep cognitive models that significantly impact upon interaction in any co-creation context (Barile *et al.*, 2015a; Saviano, 2015). In this respect, as outlined by Nootboom (2006), interaction among dissimilar cognitive frameworks supports the contamination of different knowledge offering the opportunity for hybridization and its application in different contexts of problem solving. From such a perspective, as also essentially outlined by Elmquist and Johansson (2011), the real contribution offered by the T-shaped model is related to the shift in focus from the definition, sharing, and use of information that is useful in supporting a problem solving approach to the decoding of interpretation schemes and categorical values that is useful in supporting a decision making perspective. More specifically, the ability of t-shaped profiles to apply specialized knowledge in different fields and

Marialuisa Saviano
Francesco Polese
Francesco Caputo
Leonard Wallezky
The contribution of systems
and service research to
rethinking higher education
programs: a T-shaped model

disciplines is related to their endowment of interpretation schemes and categorical values (Barile *et al.*, 2015b) that, acting in terms of Cognitive and Affective domains, resolves both conditions of problem solving (vertical bar) and the dynamics of decision making (horizontal bar), thus building opportunities to shift from a reductionist to a holistic view (see Figure 2).

Fig. 2: A conceptual representation of the T-shaped profile

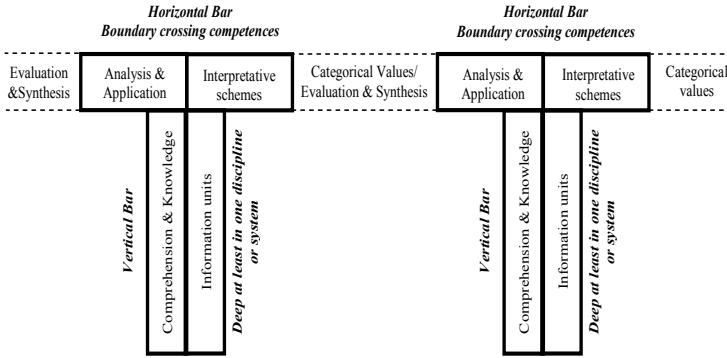


Source: Elaboration from Barile *et al.*, 2014.

Essentially, the t-shaped profile represents a new challenge in the field of education programs because it combines specialized knowledge with horizontal competences, thus opening to the possibility of a recursive multi- and trans- disciplinary approach to knowledge creation (Karjalainen and Salimäki, 2008). In this respect, each t-shaped profile becomes a piece of a complex puzzle that acquires a different structure with reference to the ways in which different profiles are dynamically composed (see Figure 3).

In summary, acting on the build of t-shaped profiles, it is possible to overcome the limits of an apparent reductionist approach in many education programs (Spohrer *et al.*, 2010). In accordance with this, the t-shaped model enables the opportunity to rethink the approach in education programs because it represents a concrete application of principles, directions, and guidelines of systems thinking and service logic in the education domain. It also supports the disclosure of the competences and knowledge required by future professional profiles to understand and manage social and economic complexity (see Figure 4).

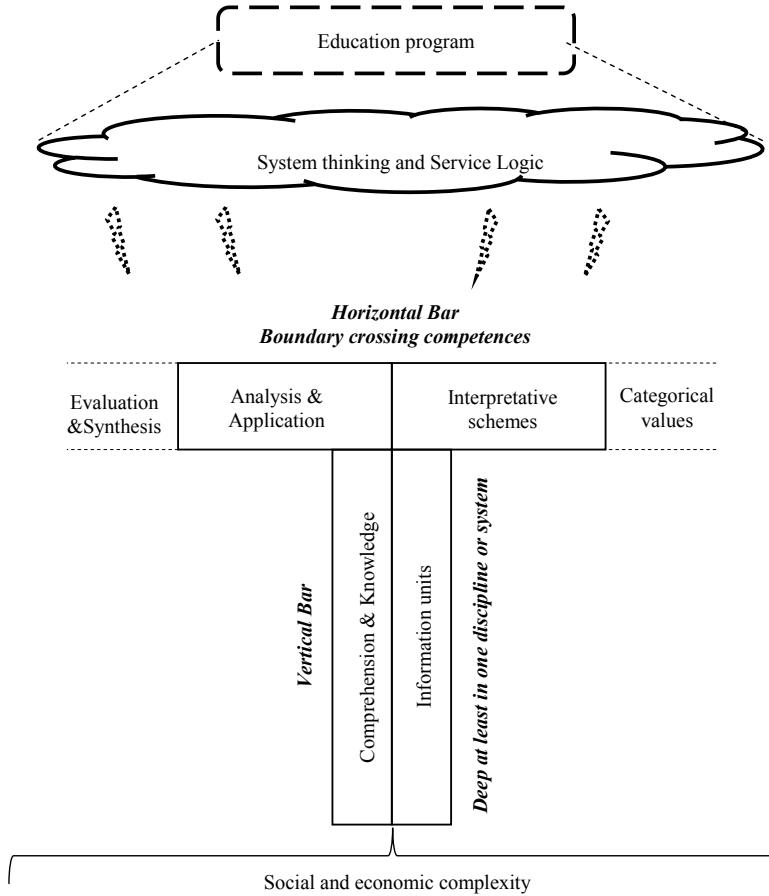
Fig. 3: A conceptual representation of interactions between T-shaped profiles



Marialuisa Saviano
 Francesco Polese
 Francesco Caputo
 Leonard Wallezky
 The contribution of systems and service research to rethinking higher education programs: a T-shaped model

Source: Elaboration from Barile and Saviano, 2013, p. 53.

Fig. 4: A T-shaped model for rethinking higher education programs



Source: Authors' elaboration.

With respect to the study on the contributions of T-shaped professional profiles, in the following section a brief discussion of the Master Degree program in SSME of the Masaryk University as an example of T-shaped based education program is presented to outline advantages and opportunities of a change in perspective in education approaches.

4. Insights from the Master's Degree program in SSME of the Masaryk University in Brno

The SSME (Service Science, Management and Engineering) study program was delivered for the first time at the Faculty of Computer Science of Masaryk University in 2008. It was a two-year Master's Study program, designed for graduates of IT-oriented study programs.

The demand for the new profile of graduates from the Faculty of Computer Science also came from the employers of firms in the ICT industry. They were asking not only for developers and programmers, but also for experts, capable of leading complex projects or driving portfolios of the project, communicating with customers from non-IT domains and understanding the complexity of multi- and transdisciplinary problems.

Many of the new courses were developed *ex novo*. The design of the courses was different - they were practically oriented, based on real business case studies and taught by external experts - to show students a more practical application and implementation of theoretical frameworks. They also contributed to the attractiveness of the study program for the applicants as well as for the companies, which were cooperating on internships.

Inspired by Spohrer (2006), the study program was designed on a multidisciplinary basis. The core of the first version of the curricula was focused to project management, applied management and marketing, with emphasis on communication skills. It was supported by the hypothesis that students had already learned necessary or important IT knowledge during their previous graduate studies and needed to focus on other disciplines related to their multidisciplinary orientation.

The other difference compared to most study programs in the Faculty of Computer Science was the lengthy internship. It was set at 5 months, during which students worked for the company for 4 days and reserved the 5th day for academic activities.

The study program started in 2008 and became very popular among undergraduates. The number of students grew from 12 in 2008 to 128 in 2010.

The T-shaped education program pivoted on the assumption of strong knowledge of information and communication technology, stemming from the students' undergraduate studies. However, this hypothesis remained unconfirmed for three reasons:

- IT itself is a dynamic domain and students need to study new technology and knowledge continuously;
- students forgot many of their IT skills, which had become layered over by others, taught during their SSME studies;

- because of the absence of Entry Tests it was possible for any graduate student to join the program, with psychology or sociology graduate students completing the SSME study program without any IT technology or skills.

Interestingly, these issues were corrected on the premise that the entire SSME study program was envisaged as a service from the start.

As Wallezky (2014) demonstrated, this situation was a dual service system, where the university produces students for companies in the first service system, while companies provide internship positions for university students, and the university is the client, because internships are a mandatory part of the study program.

Over time, thanks to the feedback reports of students and companies, the following issues were identified:

- the profile of students' knowledge did not fit the general profile of a graduate of the Faculty of Computer Science, for many students lacked basic knowledge of programming, databases or IT security;
- on the other hand, students lacked practical economic knowledge. They did not understand basic financial or taxation problems, and they knew nothing about public services and their differences.

A revision of the profile took place in 2012 and may be summed up in the following points (Wallezky, 2013):

- an entrance test was introduced in 2012;
- the T-shape structure was adjusted to ensure that IT knowledge remains the core discipline. More IT courses became mandatory;
- the knowledge at the top of the T was split into three pillars (Management and Marketing; Economics fundamentals; Soft and other skills).

Moreover, new courses were added to every group of horizontal bar courses. They were specifically designed in relation with knowledge or presented in the vertical bar.

After applying the changes, the structure was reported as satisfactory for all participating parties and has remained unchanged to date (2016).

5. Final remarks and future lines of research

The emerging variety in social and economic dynamics requires the identification of new managerial pathways that are able to combine different specialized knowledge to face the challenges of a vibrant, dynamic scenario.

Among the potential pathways devised to face emerging social and economic challenges, the paper focuses on the advantages offered by a change in perspective in higher education programs. The above considerations underline the implications and advantages deriving from the definition of education programs inspired by the T-shaped model in terms of competencies and capabilities of human resources to understand and manage emerging variety. More specifically, the paper underlines how, by combining specialized knowledge and trans-disciplinary competences, it is possible to train human resources to overcome the limitations of traditional interpretative frameworks based on a reductionist approach.

Building on this reflection, the paper represents a call to focus on the opportunities offered by the definition of multi- and trans- disciplinary approaches in the education field. Potential future lines of research related to the development of innovative approaches in education and management of human resources lie in this direction. Moreover, interesting implications may be gleaned in reference to opportunities to better formalize the T-shaped model in education programs, defining instruments capable of measuring vertical competences and horizontal capabilities in students in order to ensure better alignment between companies and human resources.

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