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The Pyramid Model:
Conceptualizing an Organizational Capability to Design IT Investments

Mikko Henrik Hirvonen, Lappeenranta University of Technology, Finland*
https://orcid.org/0000-0001-5255-8514

ABSTRACT

IT has been and is expected to be the main driver of productivity in the coming years. However, many companies are struggling to take advantage of the opportunities it provides. By building on resource-based view of the firm, dynamic capabilities framework, systems thinking, and two well established conceptualizations of an organization, in this article the 'pyramid model' to conceptualize an organizational capability is suggested. The model provides a foundation for business need-driven IT investment design. It is applicable for all types of organizational capabilities at any level of an organization. The 'pyramid model' is demonstrated with a case example. It is expected to be highly valuable in practice helping to design and justify investments to meet the business needs and to drive productivity.

KEYWORDS

Business Need-Driven, Capability System, Complementary Investments, Configurational Model, Digitalization, Dynamic Capabilities, Equilibrium, IT Business Value (ITBV), Systemic, Transformation

INTRODUCTION

Digital opportunities and information technology (IT) as an enabler has been, and is expected to be, the key driver of productivity (Remes et al. 2018). The *'modern productivity paradox'* (Brynjolfsson et al. 2019), and challenges in scaling of innovations (McKinsey 2019) anyhow indicate, that organizations are experiencing serious challenges in taking advantage of it.

In IT business value (ITBV) research, where ITBV is defined as IT's impact on firm performance (see e.g., Gandelman et al. 2019), there is an understanding that value is gained when IT is aligned with, or complementary to, other organizational variables (Kohli and Grover 2008). The prevailing approach has been IT-driven and *reductionistic* (Fink 2011) where the impact of IT has been examined with complementary investments to one or a few organizational variables. The result is a field of scattered research with very limited support to practice, whereas for practical purposes, the *holistic* and *business need-driven approach* has been called (Kohli and Grover 2008). To serve practice, several configurational multivariate organizational models have been developed, but there is no common understanding what the organizational variables in the models should be (Gandelman et al. 2019)

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and what are their interdependencies (Cao 2010). Typically, the models conceptualize operational level by ignoring organization's hierarchical aspect. Management and adaptation to the changing environment has got very little attention. The motivation to this research is to advance holistic and business need-driven approaches, the discussion of the organizational variables, and take dynamics into consideration as an important dimension.

The *purpose* of this research is to develop a configurational framework to conceptualize any organizational capability (e.g., e-commerce or any of its sub-capabilities). The framework helps to design IT investments with complementary investments to organizational variables (an 'IT investment' from now on) to achieve a targeted systemic and dynamic organizational capability based on the business needs derived from the business strategy. An *organizational capability* is defined as a firm's ability to achieve desired goals by routinely deploying available resources (Amit and Schoemaker 1993). It is the basic unit, and a building block, of a competitive advantage, and therefore appropriate unit of analysis in this research. '*Systemic*' refers to the organizational capability as a system consisting of interconnected and interdependent system elements operating in its task environment, and '*dynamic'* to its dynamic nature. The framework is demonstrated with a case example.

BACKGROUND

IT Business Value Research (ITBV)

'Invisible business value of IT' with lacking, or in many cases at least delayed bottom-line impact, led to the extensive '*productivity paradox'* discussion in 80's and 90's (Brynjolfsson 1993; Solow 1987). Although there is today a strong evidence that IT adds value (Kohli and Grover 2008) together with organizational variables, the same productivity discussion has popped up once in a while (Carr 2003) - most recently, at the eve of digitalization as a '*modern productivity paradox'* (Brynjolfsson et al. 2017).

ITBV has been recognized to manifest through *conversion processes* (see e.g., Gandelman et al. 2019) where commodity-like IT resource is converted to a synergistically operating and value enhancing asset *embedded* (Kohli and Grover 2008) to the organization and individual organizational capabilities within their context (see e.g., Schryen 2013) where *alignment* (Miller 1996) is pursued with coordinated complementary investments to adjust *organizational variables* (see review by Cao 2010). Regardless of an extensive and continuously sharpening body of research (see e.g., reviews by Schryen 2013; Schweikl and Obermaier 2022; Zhang and Arun 2021) and development of several configurational multivariate organizational models (see e.g., Cao 2010 and Schweikl and Obermaier 2022), the challenge, and a research gap, is in identification of relevant organizational variables (Gandelman et al. 2019), understanding of their interdependencies (Cao 2010), and estimation of the performance impact of different configurations (Nevo and Wade 2010). Additionally, feasibility of the prevailing *reductionistic approach*, especially in empirical investigations, has been questioned and the need for more holistic approach (Fink 2011), where ITBV is the behavior of the system (Ackoff 1999; Churchman 1971), has been emphasized. In this research, a holistic and *business need-driven approach* is embraced, but also a hierarchical view and dynamic nature of an organization is considered.

Background Theories and Systemic Capabilities

The Resource-Based View (RBV) of the firm (Wernerfelt 1984), where the firm is seen as a bundle of resources and capabilities (Amit and Schoemaker 1993), and Dynamic Capabilities Framework (DCF)(Teece et al. 1997) where dynamic capability is the capacity of an organisation to modify those (Helfat et al. 2007) and its task environment (Teece 2007), have provided valuable theoretical base to investigate how IT might help to create heterogeneity and strategic value (Cao et al. 2016). Capabilities have been classified in different ways. For example, two sides of a capability should be separated: *potential capability* i.e., what could be done, and *realized capability* i.e., what is actually done (Katz

and Kahn 1978; Learned et al. 1969; Penrose 1959; Zahra and George 2002). Capabilities have been categorized by type, when *ordinary capabilities* refer to the *operational capabilities* executing day-to-day activities (Winter 2003) and *managerial capabilities* to "*…run the organization and make and implement strategic and operational decisions…"* (Hugill and Helfat 2016). *Dynamic capabilities* refer to the firm's abilities to sense and seize new opportunities by developing existing capabilities, by reconfiguring *resources* and capabilities, and by shaping the task environment (Teece 2000; Teece et al. 1997), and *dynamic managerial capabilities* refer to the role and capacity of managers to identify *strategic opportunities* (Denrell et al. 2003) and to orchestrate changes (Adner and Helfat 2003; Harris and Helfat 2018). It has been also suggested, that companies possess non-routinized and less structured *improvisational / ad hoc* capabilities (Pavlou and El Sawy 2010; Winter 2003). In this research, an *organizational capability* is defined to consist of operational, dynamic, and managerial capabilities with varying degrees of routine. Also, distinction between potential and realized capability is done.

Systems theory (ST) has been suggested as a complementary theoretical lens to the RBV and DCF to study ITBV (Cao et al. 2016; Nevo and Wade 2010). In ST, an organization is seen as a *system* consisting of system elements, composed of interrelated subsystems, where the value is the behavior of the whole system with synergies and emergent properties rather than separated parts (Ackoff 1999; Churchman 1971). To maintain *equilibrium*, a change in any of the system elements, would most probably result compensatory changes in others (Leavitt 1965). The compatibility and interaction, of the system elements define the performance of the system (Ackoff 1999; Galbraith and Kazanijian 1986). In this research, all capabilities are considered as systemic.

Parsons' Three Levels of Responsibility and Control

Parsons (1960) broke down the hierarchical aspect of an organization and identified three levels of responsibility and control ('levels' from now on) responsible of solving different classes of problems (see also Thompson 1967a). *Operational level* is responsible of conducting operational tasks i.e., the actual 'process' where physical production of goods and/or services occurs. *Managerial level* is focused on effective performance of the operational level by organizing, coordinating, controlling and 'servicing' it (Thompson 1967a). This task is divided to *external relations* i.e., mediation between the organization and the task environment, and *internal relations* i.e., administration of the organization´s internal affairs. From external relations point of view, the *managerial level* services the operational sub-organization by procuring the resources ('resource-acquisition problem' Thompson 1967b) necessary for carrying out the operational tasks, and mediates between the operational sub-organization and those who use its products i.e., disposal of products ('output-disposal problem' Thompson 1967b). From *internal relations* point of view management level determines topics in the operational level like scale of operations, allocation of resources, integration, coordination, as well as administration and control of the operations (Thompson 1967b). On *institutional level* an organization needs to articulate with 'organized superior' agency. Accordingly, the organization is part of a wider social system which is the source of the meaning, legitimation, and the higher-level support controlling the organization (Thompson 1967a). *Qualitative breaks* exist between levels at the point where the levels connect. The levels have two-way interaction and interchange of essential inputs and outputs including information (Thompson 1967). In this research, this hierarchical view is adopted, and a *dynamic level* is added to represent dynamic capabilities of the DCF.

Leavitt's Diamond Model

In Leavitt's (1965) '*Diamond model'* an organization is defined as a multivariate system consisting of four organizational variables. *Task* refers to an organization´s *raison d'être* and expected outcomes. *Structures* are formal allocations of work roles and administrative mechanisms to organize, coordinate, and control work activities, including those that cross formal organizational boundaries. They are created by management (Penrose 1959), and consist of *systems of communication, systems of authority* (roles, responsibilities and power), and *systems of workflow*. With *technology* Leavitt referred to the

problem-solving inventions - mainly technical tools. *Actors* typically refer to the people. The variables are interdependent and consistently striving towards equilibrium. The model has been criticized of ignoring certain variables and therefore extensions has been suggested (see e.g., Davis and Olson 1985; Nograsek 2011; Scott Morton 1995). In this research, a few extensions and several specifications to the original variables are done.

THE 'PYRAMID MODEL'

Adjusted Capability Levels

An organizational capability consists of three interdependent and partially overlapping levels - each with its own types of responsibilities. *The operational level* is responsible of conducting the day-to-day value adding activities i.e., physical production of goods and/or services. This is consistent with Parsons' definition.

Parsons recognized the dependency from environment with related uncertainty but did not explicitly include this system of change to his model. In the '*Pyramid model',* the *dynamic level* is included as an own level. It is partially overlapping with managerial and operational levels and consists of two sub-levels: '*Dynamic operational level'* with responsibility of adjusting and developing existing resources and capabilities, and '*dynamic managerial level'* responsible of maintaining appropriate resource base, capability configuration, and shaping the task environment.

The institutional level is incorporated to the *managerial level.* It is responsible of gaining the meaning, legitimation, and the higher-level support for organizational capability, and of the performance. Parsons' definition is complemented by dividing management's *servicing* responsibility to the *operational managerial task* ('managerial services') and *dynamic managerial task* ('entrepreneurial services')(Penrose 1959) covered above. Both include the responsibility of *'leadership*' (see figure 1).

Capability Variables

A capability is defined to consists of four interdependent *capability variables*, which consist of *elements*. To represent selected background theories (RBV and DCF), the variables are adjusted and further specified (see figure 2). Compatibility and interaction of capability variables, and task environment, define the performance of a capability.

'*Tasks, Abilities & Qualities'* are the starting point for defining the targeted capability, derived from the business needs. *Tasks* define the expected outcomes i.e., outcomes of the *realized capability*

Figure 1. Original and adjusted levels of responsibility and control

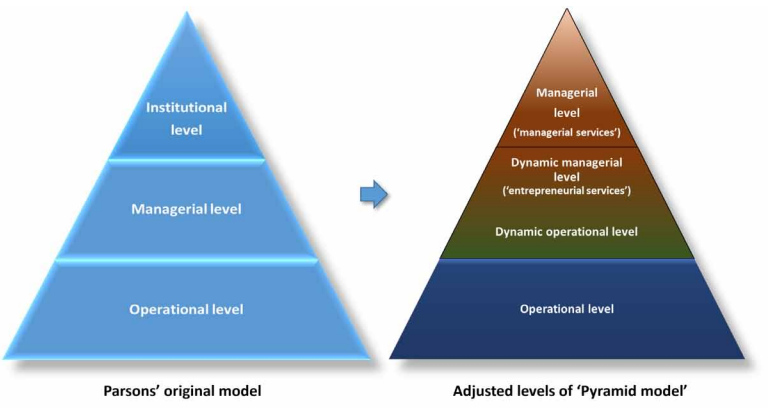
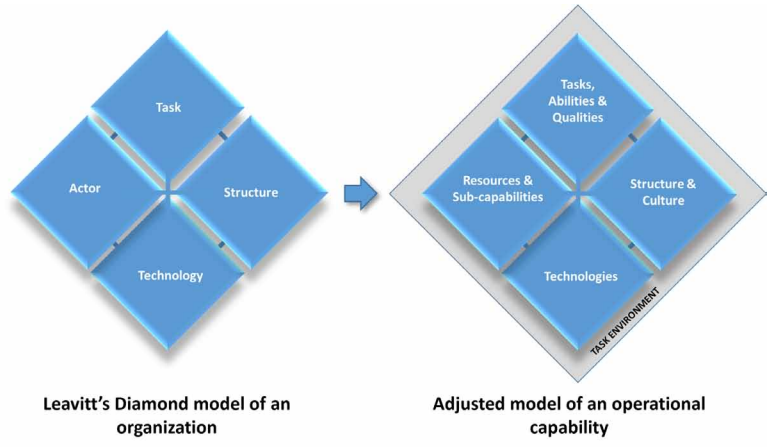


Figure 2. Leavitt's Diamond model (left) and adjusted model of a capability (right)



(or activity). *Abilities* are potential evolution paths (Teece et al. 1997) what could be done either immediately (*potential capability*), or *readiness* to develop the capability to a certain direction. *Qualities* are non-functional requirements (NFR). Tasks, abilities, and qualities should be coherent. Equally important is to understand what is not done, or for what it is not prepared i.e., trade-offs (see e.g., Porter 1996).

'*Technologies*' consist of product technology, value configuration technology (VCT) with frequency, and information systems (IS) technology (Porter 1985). The *product technology* defines the technical details of the outcome. *VCT* (see e.g., Fjeldstad and Haanaes 2018; Fjeldstad and Snow 2018; Thompson 1967a) defines how resources and capabilities are utilized to combine inputs to produce the throughput. *Frequency* defines how many times it is exercised in a certain time frame. The *IS technology* defines how data and information is gathered, processed, stored, delivered/accessed, and utilized. Leavitt defined 'technologies' only as "*problem solving inventions - mainly technical tools"*, which are considered here as *'resources.'*

'*Resources & Sub-capabilities'* cover all available resources including outcomes of sub-capabilities forming a *resource position*. *Available resources* are owned, controlled, or otherwise available for the firm (e.g., public infrastructure). A capability is highly dependent of available resources, and their mutual compatibility and interaction. To align with basic postulates of RBV and DCF, *routine* is considered as a resource, defined as a patterned and repeated way to conduct one or many interconnected task(s) by an actor (*individual routine)* or by multiple actors (*organizational routine)*. Routine evolves in a continuum from weak/non-existing (i.e., improvisational/ad hoc capabilities) to strong/perfectly routinized.

'*Structure & Culture'* is the 'administrative framework' (Penrose 1959) i.e., a formal allocation of resources and administrative mechanisms to organize, coordinate, and control capabilities - including the ones that cross formal functional and organizational boundaries. To Leavitt's original definition I'm including *incentive system*, and *culture* (organizational and/or micro) referring to the values and beliefs governing the behavior of individuals (i.e., as a steering mechanism) by giving social order (Schein 2010).

Leavitt assumed a closed system logic. Here, to better represent DCF, organizational rationality, and Parsons' model, an open system logic is assumed. Accordingly, capability is dependent of, and controlled by, its *task environment* (see Pfeffer and Salancik 1978) which as a wider social system should give the meaning, legitimation, and the higher-level support to the capability.

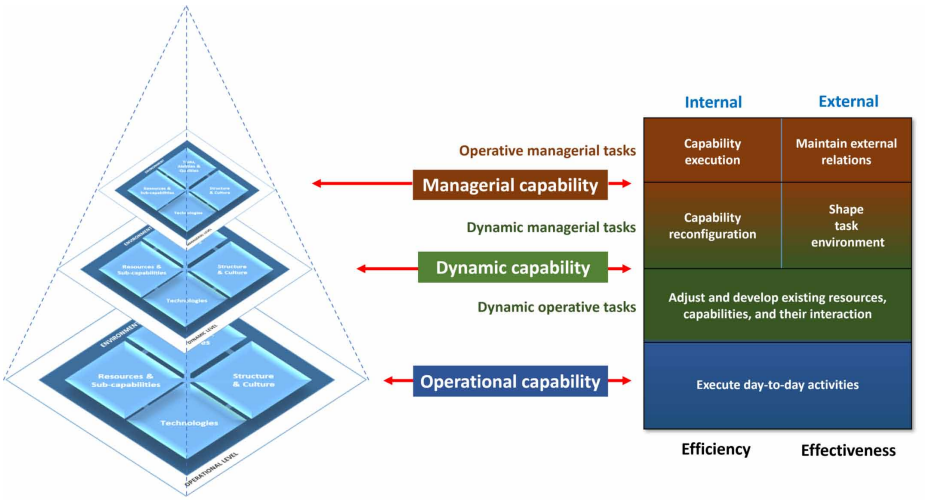
Synthesis: Organizational Capability Consists of Three Types of Capabilities

The above presented adjusted capability levels and capability variables are synthetisized to '*Pyramid model'*. Accordingly, an *organizational capability* consists of three interconnected and partially overlapping levels i.e., *types of capabilities* (operational, dynamic, and managerial), each consisting of four interdependent capability variables ('*Tasks, Abilities & Qualities'*, '*Technologies*', '*Resources & Sub-capabilities'*, and '*Structure & Culture'*). Generic task(s) are suggested to each level (figure 3).

Operational level. The '*task'* of an operational level is to execute day-to-day activities to deliver outcome(s) expected from the organizational capability. *'Abilities'* are potential capabilities what could be done either immediately, or readiness to develop it a certain direction. *'Qualities'* define the non-functional criteria (e.g., sustainability, profitability, etc.). *'Technologies'* define technical details of an outcome (*product technology*). *VCT and frequency* define how resources are used and inputs combined, and how many times it needs to be repeated in a certain time frame. How received and generated data and information is gathered, processed, stored, delivered/accessed, and utilized is defined by *IS technology*. '*Resources & Sub-capabilities'* consist of available resources, including outcomes of operational sub-capabilities, and routines. '*Structure & Culture'* define how an organizational capability is organized, coordinated, and controlled; and what are the common values and beliefs impacting to the behavior.

Dynamic level. The '*task'* of a dynamic level is to keep an organizational capability vital and ensure its *evolutionary fitness* (Helfat et al. 2007) i.e., compatibility and interaction with external environment. Here, *dynamic operative task* is to adjust and develop existing resources, capabilities, and their interaction in internal and external domains (cf. Parsons 1960). The *dynamic managerial task* is to adjust resource base and capability configuration i.e., *capability reconfiguration* (internal domain), and *shaping task environment* (external domain) i.e., 'entrepreneurial task' of management by Penrose. Non-routinized improvisational tasks to handle unfamiliar *ad hoc* problems are also included. *'Abilities'* are potential dynamic capabilities what could be done immediately and *readiness* to develop those to a certain direction. *'Qualities'* define the non-functional criteria. *'Technologies'* define the technical details of outcomes of dynamic level (*product technology*), how tasks are conducted to maintain or to seek equilibrium (*VCT*) and their frequency. *IS technology* defines how data/information is gathered, processed, stored, delivered/accessed, and utilized to conduct the tasks. '*Resources & Sub-capabilities'* consist of available resources, including outcomes of dynamic sub-capabilities, and routines. '*Structure & Culture'* define how dynamic capabilities are organized, coordinated,

Figure 3. The 'Pyramid model', types of capabilities with generic tasks in internal and external domains



and controlled; and what are the common values and beliefs impacting to the behaviour. Dynamic capabilities are dependent of operational and managerial capabilities, their path dependencies and task environment.

Managerial level. The '*task'* of managerial level is to ensure achievement of targeted performance and evolutionary fitness. It consist of *operative managerial task* i.e., capability execution and maintaining of external relations i.e., 'servicing task' (Penrose 1959) in internal and external domains (Parsons 1960), and *dynamic managerial task* - the overlapping part with dynamic level covered above. '*Abilities'* are potential managerial capabilities what could be utilized, or readiness to develop those to a certain direction. '*Qualities'* define the non-functional criteria for management. *Technologies* define the technical details of managerial outcomes (*product technology*), how managerial tasks are conducted (management methods) and frequency (*VCT*), and how information and insights are utilized and shared (*IS technology*). '*Resources & Sub-capabilities'* consist of available resources, including outcomes of managerial sub-capabilities, and routines. Managerial level is organized, coordinated, and controlled by higher level social system (their managers, business owners, institutional structures, agencies, etc.) which together determine the '*Structure & Culture*'. Managerial capability should be aligned with operational and dynamic capabilities.

Degree of Equilibrium

An organizational capability as a system of interdependency strives towards equilibrium in internal and external domains. The *degree of equilibrium* tells how well it has been achieved. An *external equilibrium* is defined as a compatibility and interaction with external environment i.e., how effectively the organizational capability is coherent and interacts with it. The higher the degree of external equilibrium, the more *effective* the organizational capability is. An *internal equilibrium* is defined as the compatibility and interaction of the levels (i.e., types of capabilities), capability variables, and elements inside the capability variables. The higher the degree of internal equilibrium, the more *efficient* the capability is.

Case: Transformation of the Financial Administration

In this chapter, the '*Pyramid model'* is used to explain transformation of the financial administration (FA) to meet the expected future business needs. The case company CASEA is a multinational concern in logistics services industry consisting of around 50 relatively independent business units (BU) in multiple countries. BUs had organized FA in their own way. Processes and concepts varied, and financial transparency from group organization to BUs was weak. Same of the IT-solutions were common, but often heterogeneously utilized.

CASEA was preparing for organic growth and acquisitions. For FA this would mean increased transaction volumes and integration of new companies to the group accounting. Simultaneously, CASEA was changing its operating model from product- to customer-oriented, which was expected to mean need for increased decision-making support. Efficiency of FA had been questioned and outsourcing discussed as an option to decrease costs.

The first step in FA's transformation journey had already been taken. A common operating model with harmonized processes and supporting modern core application was implemented to the group organization and to the two biggest BUs. CASEA was preparing to roll it out to the rest of the BUs when the group CFO changed the plans to accelerate the transformation. More efficient centralized operating model needed to be developed first, and only then the new operating model with supporting core solution would be rolled out. As a result, Shared Service Center (SSC) -program was kicked off. The guideline was that transaction processing is moved to SSC as far as possible, and business support remains in BUs.

The author acted as a program director on the customer side in the previous phase of the transformation, where foundation for this phase was created. Author's collaboration with CASEA continued in this phase as a researcher. Interviews, workshops, and collection and analysis of other

material were done for three years covering the transformation itself and around 2 years of operational use. The interviewees included group CFO and group CIO, BU CFO (biggest BU), head of group finance, head of Shared Service Center (SSC), and many process-owners and controllers. Some questions were asked from multiple interviewees to capture different points of view. Key persons were interviewed multiple times to capture changes in their thinking over time.

Operational Capabilities

'*Tasks, Abilities, and Qualities'*. No changes were expected to the transaction processing (*task*), but an *ability* to process increased volumes needed to be improved (*potential capability*). Transaction processing needed to be more efficient (*qualities*). Especially approval of purchase invoices needed to be much faster (*qualities*), because not all invoices couldn't be paid on time due to delays - not to mention that the discounts of early payments would have been utilized. Improved efficiency was seen to increase transaction processing capacity, and to release resources for development and business support. Also, improved *readiness* for more efficient capability reconfigurations and continuous improvement were targeted (e.g., centralization and harmonization were seen to improve outsourcing and benchmarking options). New customer-centric operating model necessitated improved business support (*task*). However, understanding of the requirements was incomplete and during the transformation it was accepted that only a better foundation for further development (*readiness*) can be built at this stage.

'*Technologies*'. Details of transaction processing outcomes including the services provided by SSC were defined (*product technology*). Three main processes (purchase invoice-to-pay, sales invoice-to-cash, record-to-report) i.e., *VCT*s were redefined. Processes to maintain one common customer and vendor master data and a new internal time-based invoicing process of SSC services were defined. Processing of data was redefined (*IS technology*). Due to unclarity of business support requirements (and lacking trade-offs what is left out), lots of data was recorded just in case making transaction processing very time consuming.

'Resources and Sub-capabilities'. The new core application implemented in previous phase did not fulfill all the requirements of the centralized operating model. Software licenses for additional features were acquired. Reconfigurations were done to the core solution. The data model was redefined (e.g., data elements of business partner records in 'party master'). When BUs were incorporated to the SSC, partner data was migrated and converted from the legacy systems. Due to tight schedule, not everything was done properly according to new data model. The result was, in their own terms, a "party disaster". Even though there was basically a fit between the *VCTs* and *IS technology* (data supported processes), multiple records for the same business partner (*resources – IS technology misfit*) caused serious issues e.g., in reporting, credit checks, invoice matching, etc.

System reconfigurations and changes in data model necessitated adjustments to the interfaces of the connected systems, and in some cases to those systems itself. Hardware was updated to ensure required capacity. Centralized operating model increased data transfer over the network (between SSC and BUs) necessitating increased bandwidth capacity. Time tracking solution, which generated data to the performance monitoring system, were both implemented. The head of SSC was hired. The overall headcount in transaction processing was reduced. Some were fired and some moved to business controller roles in BUs. Terminations were done before 'going live', which turned out to be a big mistake. The decision was based on incomparable external benchmarking data and incorrect assumptions of CASEA's own transaction processing capacity. Even though the end users were trained, they had no *routines.* Achievement of the required *frequency* was not possible regardless of the appropriate end user trainings. The SSC turned out to be heavily under resourced (task-resource misfit) and e.g., payments were several months late at its worst.

To strengthen business support capability, new business controllers were appointed. New experts with appropriate competences were hired. To avoid terminations, BUs often assigned people from terminated transaction processing position to these roles. However, the business controller role turned

out to be much more challenging than assumed, and many of those with background and expertise in transaction processing, turned out to be completely unsuitable to the roles (*task-resource misfit*).

'Structure & Culture'. Centralized operating model necessitated reallocation of resources between SSC and BUs. Own teams were established to the main process areas and roles and responsibilities were redefined. Approval of purchase invoices with pre-postings was left to the BUs and was moved to the persons responsible of purchases. Over the years, increased complexity of business and regulation had increased resource specialization. Instead of having subject matter experts (e.g., tax and legal specialists) underutilized in all BUs, they were now placed to SSC providing services to BUs centrally. *Performance monitoring* in transaction processing was started and KPIs/PPIs (Key/Process Performance Indicators) were defined. Performance monitoring was the basis for the developed *incentive system,* targeting to motivate people working with transaction processing. Strong focus to performance, removal of transaction processing away from the BUs (which increased transparency and enabled stronger control of group organization over the BUs) meant significant *cultural* change.

Dynamic Capabilities

'*Tasks, Abilities & Qualities'.* In SSC-program a foundation for more efficient transaction processing with higher capacity and business support was created. To maintain internal equilibrium, dynamic level needed to be adjusted to support targets of FA. It needed to be able to drive continuous improvement e.g., in processes and their execution (*dynamic operative task*), but also find more appropriate *capability reconfigurations.* Conducted outsourcing of scanning of purchase invoice, generation of sales invoices and continued optimization of task allocation between SSC and BUs are examples of this. Moving approval and pre-posting of purchase invoices away from FA to the persons responsible of purchases, is an example of *shaping the task environment*. Because the need for business support had remained unclear and was continuously evolving, it was the task of dynamic level to ensure that operational level is able to meet those needs in the future. This is an example of *capability reconfiguration* to achieve better external equilibrium. Although dynamic capabilities were not developed in a structured way in SSC-program, *readiness* for their development was improved. Harmonized processes and development of KPIs/PPIs enabled benchmarking, centralization opened opportunities for more agile reconfiguration, establishment of controller function was a step to the right direction to improve business support, etc.

'*Technologies*'. To meet the development requirements, expected outcome of dynamic level was a portfolio of prioritized and executable development initiatives, and their execution (*product technology*). Collection of feedback and ideas, knowledge sharing, and learning, co-innovation, and benchmarking (*VCT*s) were used to sense the needs and opportunities for development. To seize those, innovations were share and re-deployed. Smaller changes were done 'on the fly' and bigger ones were projectized like subsequent 'Controllership development project' to improve business support (out of the scope of this paper). In vendor led initiatives, their development methods were typically used. Feedback and innovation ideas from internal customers, performance data from transaction processing, and how they were collected, analyzed, and utilized are examples of '*IS technology'*.

'*Resources & Sub-Capabilities'*. KPI/PPI data, (internal) customer feedback, and innovation ideas were resources for the development of transaction processing. Human resources consisted of development, FA, and IT resources. Depending on the case, resources were complemented with business representatives and external experts (consultants). Customer feedback and co-innovation ideas were the main inputs for the development of business support.

'*Structure & Culture'*. The case provides a few examples of changes in the structure of dynamic capabilities. For example, active dialogue between FA and BUs management (what earlier hardly existed), and systems to collect feedback and development ideas, are examples of improved 'systems of communication'. Incentive systems to encourage performance improvement in transaction processing on operational level, supports also dynamic level (levels are partially overlapping i.e., some persons working with transaction processing were also responsible of its development). Also, implementation

partner of core solution was 'incentivized' for performance improvement with value-based contract where the price what CASEA was paying, was connected to the efficiency gains. Strong focus on continuous improvement was a *cultural* change.

Managerial Capabilities

'*Tasks, Abilities & Qualities'*. To maintain internal equilibrium, changes in operational and dynamic levels necessitated adjustments also on managerial level. *Performance* of transaction processing and its *development* needed to be actively and consistently managed (*capability execution*). Fulfillment of *outsourcing* services agreements were followed up. Relations with service providers and other stakeholders needed to be maintained much more actively than earlier (*maintain external relations*). For example, group and BU management needed to be convinced about the choices made (e.g., centralization, partial outsourcing, etc.) and actions taken, to ensure legitimation and continued higher-level support.

'*Technology*'. How these tasks were done exactly, needed to be defined (*product technology)*. For example, what was meant with performance management, and what kind of processes (*VCT*) were needed to make it happen (e.g., monitoring, guiding, and rewarding) were defined. How performance and quality related data was collected and treated objectively, were defined (*IS technology).*

'Resources & Sub-capabilities'. FA managers (*resources*) were responsible of *capability execution*. A new leader with performance management and continuous development competences was hired to run SSC. Management used information and insights of FA performance (what e.g., performance monitoring system generated), and feedback (e.g., from FA employees or from external stakeholders). Performance management and incentive systems were supporting tools for management to communicate the targets (in addition to verbal communication) to the operational and dynamic levels, and to guide and motivate by rewarding FA team from the desired behavior. With exact data regarding performance improvement, it was possible to demonstrate the progress in transaction processing efficiency and justify the choice of selected hybrid operating model (instead of e.g., wider outsourcing).

'*Structure & Culture'*. SSC leader and process managers were the key roles in centralized operating model. Like all personnel in FA, also FA management was now monitored and incentivized based on achievement of performance targets. The strong focus on performance management was a significant *cultural* change also for FA management.

Observations and Case Analysis

The 'Pyramid model' to conceptualize an organizational capability was illustrated with the case example, where FA was transformed to better meet the business needs.

Coherence of goals and lack of trade-offs. First, the multiplicity of business need-based requirements were described. Original goals to improve transaction processing capacity primarily with improved productivity (to release resources) and to improved business support were coherent. Unclarity of the required data led to the decision to continue recording lots of details just in case. Streamlining the 'data string' would have been an important prerequisite for improved transaction processing efficiency, but no trade off was made. Transaction processing capability weakened temporarily. This demonstrates the importance of coherence of the targets and trade-offs (i.e., what is not done). Group CFO commented, that building the factory for transaction processing (SSC) got all the attention: "*Too much was concentrated on building the factory and the rest of the world was forgotten* [referring to the business support]." His view was, that if they wouldn't have focused on transaction processing and SSC, they wouldn't have been able to get it up.

The case provided evidence to the assumptions, that the degree of internal equilibrium depends on the compatibility and interaction of the levels (types of capabilities), capability variables, and elements inside the capability variables. For example, achievement of targeted efficiency in transaction processing necessitated aligned dynamic and managerial levels focusing on continuous improvement

and performance management of both levels (alignment between *levels*). Adjustment of resource base on operational level is a good example how elements inside one capability variable needs to be aligned.

Inability to process transactions on time, is an example of consequences of disequilibrium between *capability variables*. The volume of transactions to be processed (*task*) was known, but incorrect assumption of transaction processing capacity due to incomparable external benchmarking data (because posting string was not streamlined) and lacking *routines* with low maximum *frequency* meant under-resourcing (task-resources-technology/frequency misfit) with serious challenges and delays in transaction processing. When internal equilibrium was not achieved, also external equilibrium was lost (e.g., vendor invoices were not paid on time). Inability to provide required business support is another example of low *degree of external equilibrium* meaning ineffectiveness.

The resource -variable provides an example of the required complementary investments to maintain internal equilibrium between elements inside the *capability variable.* New centralized operating model necessitated adjustments to the core solution of FA (e.g., licenses, configuration, data model). More network bandwidth and hardware capacity were needed. New data model necessitated changes to the interfaces and some of the connected systems. User instructions needed to be updated, users trained, and routines rebuilt.

The case provides also support to the suggested sub-categorization of dynamic and managerial capabilities and generic tasks (figure 3). Continuous development of transaction processing efficiency is an example of '*dynamic operative task'*. Centralization of transaction processing, partial outsourcing, and building of capabilities accordingly are examples of *capability reconfiguration*. Moving the approval of purchase invoices outside from FA to persons responsible of original purchases is an example of *shaping the task environment.* These all belong to the *dynamic managerial capabilities*. Management of transaction processing and its development were examples of *capability execution* of FA management, whereas interaction with outsourcing service providers, and with group and BU management to ensure legitimacy and continued support are examples how FA management *maintain external relations*. These both were categorized as *operative managerial tasks*.

LIMITATIONS

In this article, identification of organizational variables is based only one case. It is possible, that in different types of investment cases and in different contexts, new variables or at least elements inside the variables can be identified. The model does not tell anything about the *means* to conduct the required adjustments, or organization's capacity to change.

CONCLUSION

The '*Pyramid model'*, developed in this paper, is a configurational multivariate model to conceptualize an organizational capability. To the best of author knowledge, it is a unique in many ways. It is dynamic and defines capability variables more comprehensively than prior models.

The '*Pyramid model'* conceptualizes an organizational capability to consisting of three overlapping levels i.e., types of capabilities (operational, dynamic, and managerial) and their sub-capabilities (cf. Winter 2003; Teece 2018). The levels are mutually interconnected with own types of responsibilities. Each level consists of four interdependent *capability variables*. The performance of an organizational capability is materialized on system level and is explained with the degree of internal (efficiency) and external (effectiveness) equilibrium. The Pyramid model separates potential (what is possible) and realized (how much potential is utilized) sides of an organizational capability.

This research advances systemic and holistic business-need driven approach in ITBV where IT creates value with interconnected capability variables when embedded to the organization – in this case to the organizational capability. It contributes to the discussion of organizational variables and provides insights of their complementary relationships (Cao 2010; Ennen and Richter 2010; Gandelman et

al. 2019) and dynamics which has been neglected in previous configurational models. The '*Pyramid model'* opens a way for testing of holistic IT investment configurations instead of reductionistic ones.

The *'Pyramid model'* is expected to be highly valuable in *practice* helping to identify required investment components in a structured way. Improved investment design is expected to lead to the higher success rates by improving achievement of targeted organizational capability without unnecessary delays and thus shorter periods of 'temporary productivity loss' (Brynjolfsson 1993) with faster pay-offs. Business need-driven approach helps with the still relevant business/IT alignment challenge (Kappelman et al. 2021) and enables more efficient resource (including capital) allocation. The model can be used in different phases of the IT investment life cycle (design, justification, transformation, and *ex post* assessments). Application of the model necessitates an understanding of the concepts used, context, and IT investment phenomenon.

In the *future*, the model should be tested with different types of organizational capabilities, with linked capabilities (e.g., when ITBV could be realized only through linked capabilities known as 'locus of value' Kauffman and Weill 1989), and in capabilities of different level in an organization (e.g., on business model level) or even in wider entities (e.g., platforms and ecosystems).

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Mikko Henrik Hirvonen received his M.Sc. in Economics & Business Administration from the Lappeenranta University of Technology in 2002. Since then, he has been working in management consulting services industry and in IT industry in multiple expert and leader roles. He is currently writing about IT business vaslue, strategic management with the focus on strategy execution with business models.