

An Exploratory Study on Organization Processes Taxonomy

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Abstract. The rising complexity of organization context has determined scholars and practitioners to research and develop management approaches that enable businesses to be innovative and more flexible in their operations. The paper is addressing the key intellectual challenge of the knowledge workers in terms of conceptualizing the organization work as activities and processes. In this context, the authors have reviewed the best organizational practices to develop a systematic theoretical understanding of organizational processes. The methodological framework was firstly consisted of a literature review on the fundamental concepts that can help understand and organize knowledge about any kinds of activities and processes. Secondly, it has been performed an exploratory research with the aim to analyse different views of processes: quality management, business process management, and organization theory. It has been analysed multiple theories of the process perspective, resulting in a multi-level and multi-paradigm understanding of the organization. Emphasis was placed on differentiating among different process thinking traditions that suggested the major concerns that have created the context for today's interest in process approach. Even if there is a substantial body of knowledge and an increasing interest in process-oriented approach, the challenges are still remaining for knowledge workers as they have to conceptualize and formalize the work as processes. That's way, the authors have been trying to contribute to the understanding of the scope of process thinking by capturing different facets of the organization processes frameworks.

Keywords: Management science, process thinking, interdisciplinary perspectives

INTRODUCTION

During the last decades there have been arising interesting challenges within the international academic environment concerning to the development of a wide range of managerial concepts and instruments. The aim of these developments was to create the vehicle for achieving the organization excellence based on the process thinking as a fundamental unit of analysis and reflection (Brocke and Rosemann, 2010).

In today's organizations, the knowledge workers, whose primary tasks involve the manipulation of knowledge and information, are the key to innovation and growth. Acting in a more productive and effective manner requires knowledge workers to conceptualize any form of work as a process – identifying its beginning, end, intermediate steps, clarifying who's the customer, measuring the progress, and ultimately improving it. By designing end-to-end processes, the knowledge workers transcend organizational boundaries, changing the way of managing the work.

The process view has become the key enabler for organizations to survive on the long term. That's way, the researchers' efforts in domains like system engineering, organization theory, artificial intelligence, process management and engineering, and other disciplines, generated a wealth of approaches and methodologies for understanding, designing and integrating organization processes.

As a major challenge, the process thinking has an interdisciplinary character argued by the studies of the process specialization and interdependencies coordination for these processes (Malone *et al.*, 2003). The specialization and coordination issues, that guarantee the coherent functioning of the systems, are in the interest area of various disciplines, such as:

- Biology – studies the interaction mechanisms of different components/processes in living organisms (e.g., human genome project permits the classification of living organisms based on DNA code);
- Organizational theory – studies the modalities of the individuals to coordinate their activities in the work space/organization;
- Economics and operations research – analyse the influence of information flow coordination on resource allocation for different agents (commercial companies, decision makers, other stakeholders);
- Artificial Intelligence – studies and analyses the processes that guarantee the coherent management of limited resources used by processors, memories and other IT devices;

The process thinking has also a trans-disciplinary character argued by the process oriented reasoning (inputs, outputs, activities executed to achieve a well-defined goal) that enables the holistic understanding of any system (biological, natural, business, and so on) as a coherent whole that works through specialized components/processes and coordination mechanisms of their interdependencies.

Within this sphere, the objective of the paper is to address the problem of intellectual challenge concerning the conceptualization of the organization work as processes by reviewing the relevant literature and by analyzing the organization processes taxonomy.

MATERIALS AND METHODS

The method used for accomplishing the paper objective is based on the exploratory research through literature review. In this regard, the scientific literature highlights that viewing work as a process is not a novel idea. The roots are dated in 1911, from Frederick Taylor's work simplification theory that has focused on monitoring and controlling systems in order to measure and reward work outputs. The advent of process idea is linked to the shift between classical views of organization structure with the process thinking. The classical approach has viewed organization as a collection of functional areas such as research and development, production, marketing, finance, accounting, human resource, and so on. This type of organization has created conflicts, communication difficulties and sub optimizations because the work has executed under the coordination of a functional manager before being passed into another functional area. Since the employees from the functional area were rewarded based on how well they performed with regard to their own specific area, this created functions conflicts as each one competed for scarce resources and completed a part of what was needed to deliver product to customers (Jaston and Nelis, 2006).

The advent of IT era and the increasing competition have changed the way work was managed by thinking about customer instead of getting too absorbed with accomplishing internal targets or resolving internal conflicts between functional areas. Therefore, the organizations shifted the focus from functional view to process thinking since the process has a cross-functional nature. Kirchmer (2011) has viewed the process as a set of functions performed in a certain sequence that deliver at the end a value for an internal (other processes) or external client (customers, stakeholders, etc.). In other words, the process takes the inputs from one functional area, performs a set of activities that adds value to the inputs, and delivers the outputs to another functional area from organization.

During the last decades, the concept of process as unit of analysis has attracted the interests of plenty of researchers. Their attempts were focused on defining the process management and identifying and analysing the benefits of designing organizational processes. In this regard, the researchers are currently moving toward an agreement that process analysis falls under the boundaries of process management/business process management domain. As scholars pinpointed, business process management is an evolving discipline being focused on improving organizational overall performance by managing the organization's processes. Thus, process management represents an integrated part of management being defined as a consistent way to understand, document, model, analyse, simulate, execute, and continuously change the end-to-end processes and all involved resources in the light of their contribution to the overall organizational performance (Jaston and Nelis, 2006).

The emergence of process management is supported by meaningful developments in the field. The essential points in the process management evolution were brought by the quality management perspective, management approach, and IT advent. In this regard, the authors have designed the Fig. 1 that depicts the essential points of the process management developments.

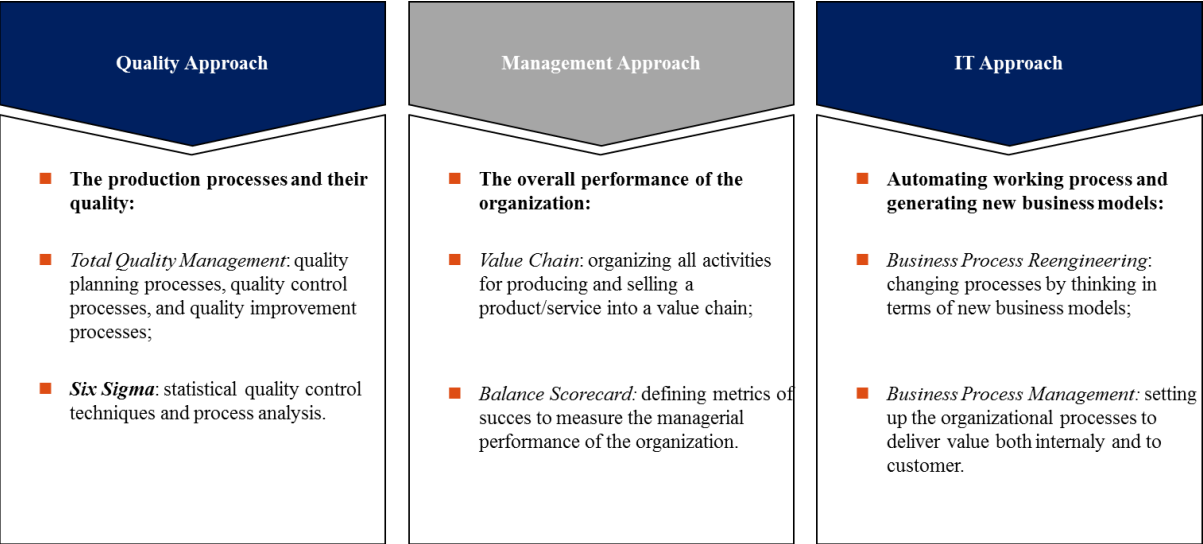


Fig.1 Process management developments (designed by authors)

From the quality perspective, the focus was on the production processes and on defining and controlling the quality of these processes. Therefore, the researchers have defined a set of three processes: quality planning, quality control, and quality improvement that assures the engagement of all employees towards the quality of organizational processes. In the same light, the key role in creating the quality of processes was brought by the rigorous method - Six Sigma. The technique is aiming at continuous improvements of products, processes, and services based on a DMAIC cycle: Define Measure, Analyse, Design, and Verify (Pyzdek and Keller, 2010).

Interestingly, the management approach has changed the focus on defining a value chain with organizational processes that support a product line, a market, and its customers. The value chain concept makes a clear distinction between core processes: research and development, production, marketing and selling, and support processes such as procurement, human resources, IT, etc. (Porter, 1985). Moreover, Kaplan and Norton (2006) have developed the value proposition concept that allows a thoroughly understanding and

modelling of the organization so that the activities and processes that add no value should be eliminated.

The evolution of information technologies has moved the interests towards the organizational processes modelling based on automated processes that facilitated radically new business models. Business process reengineering has emphasized the holistic approach of organization by encouraging full-scale recreation of processes rather than iterative optimization of sub processes by redesigning the way work is done to better support the organization's performance (Hammer and Champy, 1993). In this way, business process management has emerged as a comprehensive approach from the former developments sharing the belief that process thinking leads to proper improvements in organization performance. As a managerial approach, Business Process Management views the processes as strategic assets of any organization that must be understood, managed, and improved to deliver value-added products and services to clients.

In this regard, the organizations striving for innovation, flexibility, and integration with new technologies have to align their processes with the needs, expectations, and wants of the customers. This requires knowledge workers to design and-to-end organizational processes based on the conceptualization of any form of work as a process, identifying its beginning, end, intermediate steps, clarifying who's the customer, measuring the progress, and ultimately improving it.

RESULTS AND DISCUSSIONS

Considering the complexity of organizational environment, it seems reasonable for knowledge workers to adopt a process perspective as a unit of analysis. Organization theory offers valuable insights that help elaborating the process conceptualization and provides an explanation of how the inputs and outputs are related, rather than simply noting the relationship.

Organizational theorists have suggested that processes provide a useful unit of analysis to narrow the study of organizational form because of the diversity of activities and micro-climates found in most modern organizations (Mohr, 1982). Since the theorists used the processes to describe the casual chain that relates independent and dependent variables, the process model provided a unique perspective on innovation, strategic change, and organizational behaviour (Abbot, 1992; Van de Ven, 1992).

Within the sphere of organizational theory there are two interestingly approaches that enable a thoroughly organizing and analysing knowledge about process concept as showed in Tab. 1.

Analysing the organizational processes based on the coordinating theory requires a set of fundamental concepts that help understand any kinds of activities and processes: specialization and coordination mechanisms. In order to analyse the organization processes, the most of practitioners use only one dimension by breaking the process into its different parts. According to Malone *et al.* (2003) the notion of specialization of process adds a second dimension for analysis in terms of differentiating a process into its different types. As in object-oriented programming, the specialized processes automatically inherit properties of their generic process parents, excepting where they explicitly add or change a property (Wegner, 1987).

Organizational theories for process concept analysis

Key theories	Description
Coordinating theory	<ul style="list-style-type: none"> • Specialization of processes based on the working nature of the process activities • Coordination mechanisms correlated with the types of dependencies among process activities: flowing, sharing, and fitting dependencies
Grammar rules theory	<ul style="list-style-type: none"> • Specify how a process model can be composed and what domain semantics can be expressed • Process models act as blueprints of organizational processes

Based on this approach, the first dimension represents the conventional way of analysing processes – according to their different activities parts, and the second dimension enables to analyse the processes according to their different types of activities. It is worth to mention that the specialization concept enables a bundle of related alternatives for different activities parts by answering to two questions: “How the activity is performed?” and “What is being done?”. Fig. 2, developed by the authors, shown the notion of specialization applied for a buying process.

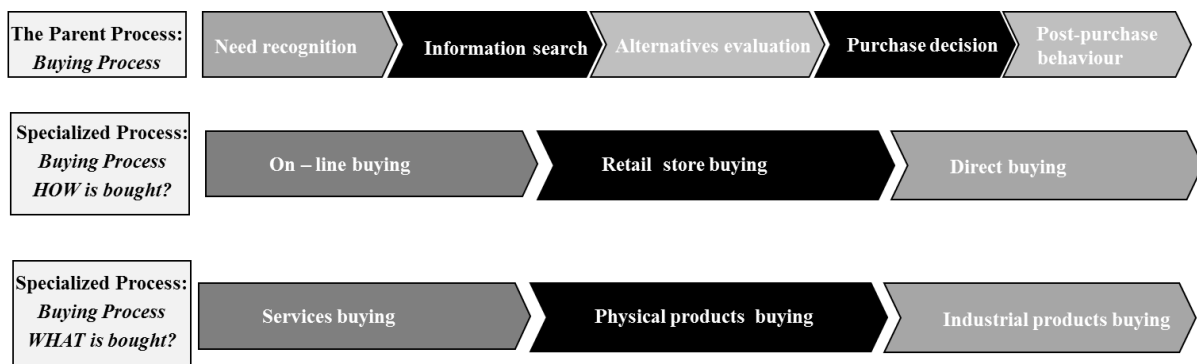


Fig. 2 The concepts of specialized and general processes (designed by authors)

The characteristics of the parent process activities are passed over the sub activities of the specialized process. For example, the information search activity is performed in any subsequent specialized processes such as on-line buying, retail store buying or direct buying, but it gains specific terms and conditions depending on the way of buying or on the type of the product bought.

The dependencies among process activities and organization’ resources determine the coordination issues that constrain the way activities can be performed. These constraints require designing coordination mechanisms that can manage the dependencies. The last several decades of researches in computer science and other disciplines have resulted in using the coordination notion as managing dependencies among activities (Malone and Crowston, 1994). Analysing processes in terms of dependencies and coordination mechanisms offers a special leverage for redesigning organizational processes.

As theorists suggested there are three basic kinds of dependencies that arise from resources related to multiple activities: flowing, sharing, and fitting (Zlotkin, 1995). These dependencies are occurring between activities in a process because they use common

organizational resources that create the dependency. Tab. 2 shows the relation between dependency types and coordination mechanisms.

Tab.2

The dependency and coordination mechanisms taxonomy

Dependency type	Description	Coordination mechanisms
Flowing dependency	The output of an activity is a resource that is an input for another one	Flow management mechanisms for managing the process constraints: <ul style="list-style-type: none"> • Precedence constrain • Accessibility constrain • Usability constrain
Sharing dependency	The process activities use resources simultaneously	<ul style="list-style-type: none"> • Resources planning by scheduling techniques • Resources conflict resolution techniques
Fitting dependency	The effects of two activities are fitting in a common output/resource	<ul style="list-style-type: none"> • Resource simulating techniques • Resource scheduling techniques

The flowing dependency arises whenever one activity produces a resource that is used by another activity. The corresponding coordination mechanisms encompass various techniques such as just in time, detailed advanced planning, making at the point of use, or using standard that manage the process constraints in terms of right time (precedence), right place (accessibility), and right thing (usability) for the resources that create the dependency. The IT advance has introduced new coordination mechanisms such as network protocols that coordinate the chain between the resource consumer (receiver) and resource producer (sender). This coordination mechanism ensures that the resource producer does not send faster than the resource consumer can receive.

The sharing dependency occurs whenever multiple processes activities use the same resource such as human resources or technical ones. This kind of dependency has associated a set of coordination mechanisms for managing constrains. The first come-first serve, budgeting, and managerial decisions represent major techniques for eliminating constrains and for generating new organizational processes.

The fitting dependency arises when multiple activities collectively produce a single result/resource. The product designing process represents a well example of fitting interdependency because project team members have to design different parts of the final product and these subassemblies need to fit together into the completed final product. The corresponding coordination mechanism requires simulation techniques for managing the dependency.

Thus, the coordination theory has proposed an alternative perspective on processes as an assembly of activities characterized by different kinds of resources dependencies. These dependencies between activities that use resources impose constraints on the ways activities can be assembled and requires organization to design and implement appropriate coordination mechanisms for managing them.

Another valuable insight that deciphered the complexity of organizational environment with emphasis on the process concept is consisted of the grammar rule approach/theory. The grammar provides a concise way of describing a language because it embodies a set of patterns in terms of a finite lexicon (words) and a finite set of rules (syntax) that specify allowable combinations of the elements in the lexicon (Malone *et al.*, 2003). In

other words, the grammar represents the framework that integrates the words, as different abstract entities, with the combination rules of words (the syntax) for designing logical sentences, and the semantic coherently binds the constructs defined in the syntax to a meaning. Interestingly, as linguistics argued the grammar provides potential infinite sentences based on a finite set of words and a finite set of rules, hereby proven the generative effect of the grammars.

Based on this, in recent years, the organization theorists have been used frequently the grammatical concepts in connection with organizational processes with emphasis on the generative proprieties of the grammatical models as a key possibility of predicting organizational processes based on a given set of constraints (Salancik and Leblebici, 1988). Tab. 3 presents the terminology used in organization theory concerning the process as a unit of analysis.

Tab.3

Key terminology in organization theory

Terminology		Description
Linguistic theory	Organization theory	
Words	Moves	Organizational action units
Syntax	Grammar models	Set of assembly rules for combining the action units
Sentences	Processes	Mapping the sequences of actions that are situated in time

In organization theory, the moves are the basic building blocks that consists of a combination of several actions and that can be combined to create more complex structure. If we consider the example of a buying process from the organization point of view, the moves can be describe as analysing the organization needs, searching offer information, comparing the alternatives, making purchase decision, and performing post-purchase behaviour.

The growing interest in process analysis has generated a variety of methodologies for analysing the sequence of events with emphasis on discovering major regularities in sequence of events that can be observed, coded, and compared. Worthy to be mention here, the Event-driven Process Chain (EPC) is a widely used modelling language thanks to its broad software tool support (Mendling, 2008). As scholars argued, the Event-driven Process Chain (EPC) enables a clear representation the logical and temporal dependencies of activities encompassed within any type of process and consists of the following key objects flow: activities/actions, events, process interface, and connectors, as syntax elements that enable the conceptual integration of the information systems design (Scheer *et al.*, 2005). The events describe pre-conditions and post-conditions of activities/actions and do not consume resources of any kind. The process interface is a syntax element that designates an input from another process, an output for other process, or an output for another process with feedback loop after the execution of that process. The connectors describe the precedence relationship between the activities or the process interfaces.

However, the grammar models added a different approach to these tools for analysing processes based on the understanding of connections between the sequences of actions/activities and of the organizational or structural features that enable and constrain the set of assembly rules. In this view, the organization researchers highlighted the importance of structure in process analysis. Institutional structure, technological structure, coordination

structure, and cultural structure provide constraints and affordance for organizational processes. The institutional structure determines different sequences of events and activities as it reflects the social division of labour in an industrialized economy (Jepperson, 1991). Technological structure with emphasis on technological innovation has resulted in different pattern of social interactions determining changing the way of assembly organizational activities and events. Coordination structures emerge a variety of constraints because of different kinds of interdependencies between organization activities/actions. Another meaningful constraint that operates at many levels in organization is referring to the cultural structure. Norms and expectations account for many constraints on what moves are possible, and on the appropriate sequence of moves in a given situation.

As consequently, grammatical models represent a useful way to describe the sequence of actions that make up organizational processes. At a practical level, grammatical methods provide a framework for generating and comparing different alternatives of organizational processes. The grammar models act as blueprints of organizational processes and represent a meaningful tool for adopting design decisions to warrant improved efficiency, cost reduction or increased compliance with organization objectives (Recker, 2011). Based on studying the syntax of a wide variety of organizational processes, it is possible to predict which specific kinds of routines are more effective in various situations. In addition, grammatical models suggest an explicit relationship between the structural constraints derived from organization theory (institutional, technological, coordination, and cultural structures) and the details of organizational activities/actions, routines, and processes.

CONCLUSION

The pressure for excellence and innovation has widely recognized the key role of 'process' concept in improving knowledge work through process-based approach. Considering the complexity of organizational environment, the paper has been deciphered the scientific literature to provide insights and understandings of the organizational processes' concepts and taxonomy.

Obviously, the meaningful challenge of today's knowledge workers is to understand the complexity of organizational environment with the help of process as unit of analysis. Understanding some characteristics of processes and comparing different views of processes theories may give a clear perspective of the organizational processes. However, practice without a solid theoretical backbone related to process concepts is hazardous especially when knowledge workers adopt change efforts as a way of surviving and growing in this modern world. That's way, the process thinking creates a platform for assuring and raising the ambition level of practice for organization aspiring to obtain high performance.

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