Received 24 June 2012
Revised 16 January 2013
Accepted 21 January 2013

Business process management: a systemic approach?

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Abstract

Purpose – The purpose of this paper is to assess whether the business process management (BPM) approach contributes to applying systemic characteristics in organisations.

Design/methodology/approach – This is a theoretical and descriptive work based on a review of the literature on BPM and systemic approach.

Findings – From the analysis of its stages, it was possible to find a strong correspondence between BPM and the systemic characteristics found in the literature.

Practical implications – The paper presents practical implications to professionals as well as academics. The contribution to the body of knowledge on BPM derives from the identification of systemic characteristics in it, thus justifying its practical application to organisations in order to ensure better systemicity and adaptability. As processes are directed to the same goal, unnecessary and misdirected steps are redesigned or eliminated, concentrating resources on core processes and improving the organisation's performance. The paper also contributes to education, since the systemic approach may be a key subject to clarify the inter-relationships among processes, and processes and their contexts.

Originality/value – The originality resides on elucidating the systemic characteristics of BPM, being academically valuable for justifying the studies about such an approach, besides contributing to the characterisation of its basic assumptions as well. In addition, the value of the present work for business management resides in the identification of a practical approach which can be applied to organisations in order to ensure them systemicity and flexibility.

Keywords Organizations, Business process management, Flexible organizations, Systemic approach, Systemic thinking, Process orientation

Paper type Conceptual paper

Introduction: the need for systemic approaches

Scholars have been arguing for at least 25 years that organisational environments are becoming increasingly complex (Skarzauskiene, 2010; Vasconcelos and Ramirez, 2011). In fact, much more businesses, institutions and societies are interacting to each other, and therefore we refer to this economy as global (Ackoff, 1994). Globalisation has strategic implications for organisations as well as for societies (Leidner, 2010).

Organisations operating in the current complex and turbulent environment often have to implement changes in their structures, processes and other organisational

Business Process Management Journal
Vol. 19 No. 4, 2013
pp. 698-714

1463-7154
DOI 10.1108/BPMJ-Jun-2012-0064

Acknowledgments to Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), from Brazil, for the scholarship granted to the Master student Mayara Segatto, allowing full-time dedication to research.

aspects (Kogetsidis, 2011). As a result, the challenge for managers is to survive a turbulent environment and to be prepared for a future which cannot be predicted (Ackoff, 1994).

At the extent that the business environment becomes more complex, more crucial decisions involving highly complicated and tricky problems are made (Vasconcelos and Ramirez, 2011). Within this context, structured decision-making procedures with reductionist and linear characteristics cannot deal with the managerial complexity, even the most sophisticated ones (Vasconcelos and Ramirez, 2011).

Therefore, new managerial approaches are needed to allow organisations to grow and increase their competitiveness and capacity for value creation. The systemic thinking appears like an alternative to the reductionist thinking (Barton *et al.*, 2004; Jackson, 2003), enabling more effective performance through taking into account inter-relations in the business environment.

The search for more efficiency has led organisations to review the managerial approach based on the client's perspective, transforming isolated efforts into cross-functional activities which can be integrated and measured for value generation (Antonucci and Goeke, 2011). Several initiatives and approaches such as systems thinking, operations research and socio-technical systems all have processes as their underlying theme (Seethamraju, 2012). According to Hung (2006), the term "process" is found in many disciplines such as systemic thinking (Checkland, 1981), cybernetics (Beer, 1966) and systems dynamics (Senge, 1990), all giving a richer meaning to such a word. In the business context, the business process management (BPM) is an increasingly used approach for managing process-oriented organisations (Trkman, 2010; Wynn *et al.*, 2009). Traditional and reductionist methods are limited in understanding complex systems as those involved in BPM initiatives, so the concepts of systems applied to BPM can result in benefits (Siriram, 2012). Researchers like Pourdehnad and Hebb (2002), Pourdehnad and Robinson (2001) and Siriram (2012) developed works where a systemic thinking has been applied to business process initiatives and organisational learning activities. In this sense, Siriram (2012, p. 88) states that "little work has been done in terms of systemic thinking and a new paradigm in terms of BPM". Therefore, the objective of the present study is to assess whether the BPM approach has systemic characteristics so that it can be a practical solution for managing organisations systemically.

The next section addresses methodological aspects of the research, whereas the following one presents the systemic assumptions and organisations as systems. Aspects related to BPM as well as its correlation to systemic characteristics are also addressed. Final considerations resume the main aspects, adding originality and value to the study.

Methodological aspects

The present work is characterised as a theoretical and descriptive study in which the bibliographical review was the technique used in the search for the following themes in the literature: globalisation and complexity, systemic thinking and BPM.

The searches were performed by combining the following keywords: systemic thinking, organisations, complexity, systemic approach, business, management, globalisation, reductionism, organisation, BPM and process orientation. Also, adaptations were made to each database.

Textbooks and databases, such as SCOPUS, Web of Science and Emerald, were used to search for the themes in question, including journals focusing on systemic thinking and processes. The search filters were set to restrict the results to the business area. However, it is important to emphasise that as our study was aimed at fundamental principles, classic publications were predominant, thus justifying the non-structured review of the literature.

After searching the databases, the articles were filtered twice: the first filter (F1) consisted in reading title, abstract and keywords, whereas the second one (F2) consisted in reading the full text. Due to the non-structured nature of the literature review, only authors known for their contribution to the systems theory area were chosen as well as those works characterised by a common knowledge on BPM (Association of Business Process Management Professionals (ABPMP), 2009). In addition, new contributions to the arguments addressed in the present research could also be freely sought from the references cited in the studies we found. Three inclusion criteria (IC) were elaborated for selecting the studies as follows:

- IC1 – basic principles characterising the BPM approach.
- IC2 – basic principles characterising the systemic thinking.
- IC3 – relationship between BPM approach and systemic thinking.

The articles and textbooks selected for study met at least one of the three IC established above, with relevant information being summarised for use and development of this work. Table I shows the textbooks used in the present research.

Textbook	Year
ABPMP (2009), *Guia para o Gerenciamento de Processos de Negócio – Corpo Comum de Conhecimento (BPM CBOK)*, Association of Business Process Management Professionals, Vol. 2.0, 247 p.	2009
Ackoff, R.L. (1994), *The Democratic Corporation*, Oxford University Press, New York, NY, 247 pp.	1994
Beer, S. (1966), *Decision and Control*, Wiley, Chichester	1996
Bertalanffy, L.V. (1968), *General Systems Theory*, George Braziller, New York, NY	1968
Brocke, J.V. and Rosemann, M. (Eds) (2010), *Handbook on Business Process Management 1: Introduction, Methods, and Information Systems*, Springer, Heidelberg	2010
Checkland, P. (1981), *Systems Thinking Systems Practice*, Wiley, Chichester	1981
Churchman, C.W. (1968), *The Systems Approach*, Dell Publishing Co. Inc., New York, NY	1968
Davenport, T.H. (1994), *Reengenharia de processos*, Campus, Rio de Janeiro	1994
Espejo, R., Schuhman, W., Schwaninger, M. and Billelo, U. (1996), *Organizational Transformation and Learning*, Wiley, Chichester	1996
Gigch, J.P.V. (1974), *Applied General Systems Theory,* Harper & Row, New York, NY	1974
Harmon, P. (2007), *Business Process Change: A Guide for Business Managers and BPM and Six Sigma Professionals*, 2nd ed., Elsevier/Morgan Kaufman, Amsterdam	2007
Jackson, M.C. (2003), *Systems Thinking – Creative Holism for Managers*, Wiley, Chichester	2003
Jeston, J. and Nelis, J. (2006), *Business Process Management: Practical Guidelines to Successful Implementations*, Elsevier, Oxford	2006
Melcher, A.J. (1975), *General Systems and Organization Theory – Methodological Aspects*, Kent State University Press, Kent, OH	1975
Senge, P.M. (1990), *The Fifth Discipline*, Century Business, London	1990

Table I.
Textbooks selected for study

Systemic thinking in organisations

According to Bertalanffy (1968), we deal with "complex", "totalities" or "systems" in all the fields of knowledge, which implies a crucial re-orientation of the scientific thinking. The systemic thinking offers an important alternative to the reductionist approach (Jackson, 2003; Korn, 2011) and those related to disciplines in the social sciences (Barton *et al.*, 2004).

For Small and Walker (2011), problems involving linear causality relationships, which have defined beginning and end, can be understood by using the traditional approaches. On the other hand, those problems involving complicated situations or a set of inter-related developmental questions and restrictions, which usually present dilemmas or conundrums, can be understood from the systemic thinking and related approaches (Small and Walker, 2011).

The traditional analysis breaks up the study object, whereas the systemic approach focuses on how the object interacts with other elements of the system to which it belongs (Skarzauskiene, 2010), considering the whole and its relation to its parts (Müller-Merbach, 1994). Therefore, the systemic thinking allows knowledge and understanding to be obtained from the complete construction of images of the phenomena rather than dividing them into parts (Flood, 2010).

Considering the development of the systemic thinking theories, it is possible to define three main temporal phases: the early years, the 1920-1960s, when the fundamental concepts were developed within and between several disciplines; the 1970-1990s, when specific methodologies (soft systems methodology, viable system model and others) were created; and more recently, one can cite the emergence of the theory of chaos and complexity (Mingers and White, 2010).

Mingers and White (2010) have analysed the contribution of systemic thinking to the management sciences by assessing their applications in a variety of areas, including strategy, systems of information, information technology, organisations and corporate social responsibility and production and management of projects. Skarzauskiene (2010) also analysed the application of systemic thinking to organisational sciences, indicating important aspects for its application. Applying complexity concepts to management and decision making in industry, Forrester (1958) defended that advances on complex systems research would contribute to the development of new management concepts.

The key concepts of systemic thinking were developed at the beginning of the twentieth century (in modern times), including the following: parts/whole/subsystems, system boundaries/environment, structure/process, emergent properties, system hierarchy, positive and negative feedback, information and control, open systems, holism and the observer (Mingers and White, 2010). The systems approach is necessarily comprehensive, holistic and inter-disciplinary (Müller-Merbach, 1994).

Despite what one may conclude from studies in this subject, there are a variety of versions of the systems approach. Müller-Merbach (1994) presents four types of systems approaches:

(1) *Introspection.* Analytic reduction: based on the division of things in smaller parts (understood as subsystems) until the final elements that can be comprehensible.

(2) *Extraspection*. Synthetic integration: consider things into their purposeful contexts, insert those (understood as subsystems) on higher systems, until the whole is complete enough to be comprehensible.

(3) *Construction*. Creative design: based on the division of things into parts and, at the same time, on the insertion of them into their purposeful contexts, carrying on with both processes until you feel safe enough to design them and, thus, comprehend them.

(4) *Contemplation*. Holistic meditation: things are indivisible, they are systemic wholes, so one need to identify with them to reach understanding.

In this study, we aim to consider any version of systemic approach, including all the characteristics we were able to find in the literature, in order to understand if BPM presents some of them.

Organisations are complex and inter-related phenomena, and therefore the linear single cause-effect models fail in explaining the reality (Melcher, 1975). The systemic approach emerges as an alternative for those organisations wanting to deal with the growing complexity and respond to the environmental demands, thus increasing their competitiveness and sustainability.

When the environment changes, the perception of it also tends to change. This is manifested through the evolution on how one conceptualises the organisations, which ranged from the mechanicist view (i.e. as machines) to the biological (i.e. as living beings) and social (i.e. as social systems) ones (Ackoff, 1994).

There are many definitions of systems in the literature (Bertalanffy, 1968; Beer, 1966; Churchman, 1968; Gigch, 1974), but in general the majority has three central ideas in common (Arregui, 2001):

(1) systems have a set of parts;

(2) there is an inter-relationship between these parts or elements; and

(3) they have a coherent pattern (i.e. common purpose or objective) ensuring that the interacting parts form the whole.

The essence of systemic thinking includes the following: understanding the inter-relationships rather than the linear cause-effect relationships; viewing the dynamic rather than the static processes and viewing and understanding the context (Skarzauskiene, 2010). According to Goh *et al.* (2010), one of the key factors in the systemic thinking is to recognise the circular nature of the majority of the systems. For Ackoff (1994), a system is a whole containing two or more parts which meet the following five conditions:

(1) The whole contains one or more defining functions.

(2) Each part can affect the behaviour or properties of the whole.

(3) There is a subset of parts which is enough in one or more environments for meeting the defining function of the whole; each of these parts is individually necessary, but insufficient for meeting such a defining function.

(4) The way how behaviour or properties of each part of a system affects the behaviour or properties of the whole depends on the behaviour or properties of at least another part of the system.

(5) The effect of any subset of parts on the system as a whole depends on the behaviour of at least another subset.

According to Gigch (1974), systems are characterised by the following: elements, conversion process; inputs and/or resources; outputs; environment; purpose and function; attributes; goals and objectives; components; programs and missions; management, agents and decision makers; structure and states and flows. In addition, Arregui (2001) lists some properties of the systems:

- *Emergent properties*. Feature related to the concept of synergy in which the inter-relationship between the parts produces something which cannot be verified by each part, being beyond the simple aggregation of the parts – the whole is more than the sum of the parts.
- *Recursive structure and inter-relationships between components.* The components of the system relates to each other and the whole system contains and is contained in another system (recursivity).
- *Communication and control.* Features directly related to the idea of survival of the system, allowing the system to adapt to the environmental disturbances and to maintain the sense of wholeness.

What one understands as a systemic focus in general includes some aspects (Mingers and White, 2010) as follows:

- Viewing the situation holistically in opposition to reductionism, that is, as a set of elements interacting within the environment.
- Recognising that relationships or interactions between elements are more important than the elements themselves for determining the behaviour of the system.
- Recognising a hierarchy of system levels and the resulting ideas of emergent properties at distinct levels, including mutual causality among them.
- Accepting, especially in social systems, that people will act according to distinct purposes or rationalities.

According to Mingers and White (2010), the importance of systemic thinking for organisational management has been recognised since the beginning by the founders, such as Ackoff (1994) and Churchman (1963). Gigch (1974) states that organisations are more orderly systems compared to other living systems, with this order being interpreted in terms of higher complexity and conscious determination towards goal achievement. Many authors emphasises the importance of systemic thinking for the organisational management, but it is difficult to summarise and group the theories as their authors rely on different attitudes regarding both systemic thinking and meaning of the organisational performance (Skarzauskiene, 2010).

Due to the enterprise's relationship with its environment, it can be considered an open system because it receives inputs from the environment, processes them and returns them before re-beginning (retroaction) the cycle again – input, processing and output (Ackoff, 1994; Beer, 1966; Bertalanffy, 1968; Gigch, 1974). Therefore, organisations influence and are influenced by the environment by means of regulatory and balancing mechanisms, with a feedback loop (Figure 1). In addition, the organisation belongs to a recursive structure because it contains subsystems with their own goals while being included in a larger system which, in turn, has its own existence.

Analysis of organisational systems can provide defined answers as well as practical indications (Bertalanffy, 1968), since when an enterprise adopts a systemic approach

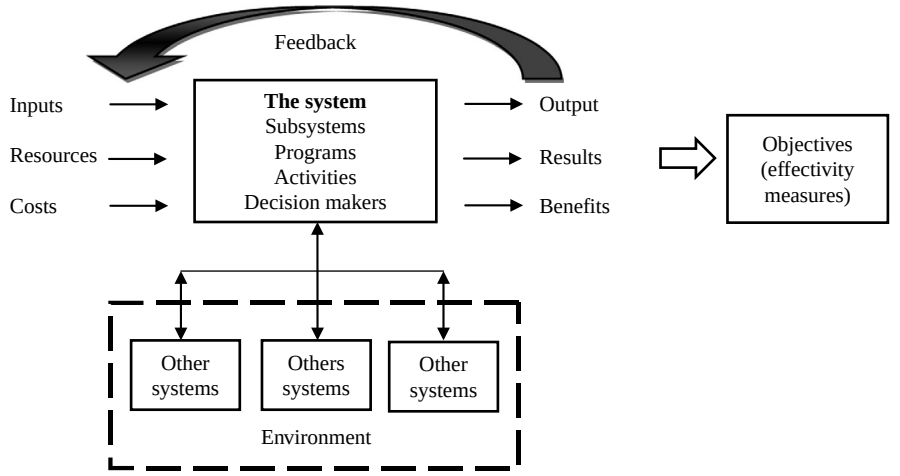

Figure 1.
An organisation as a system and its environment

Source: Adapted from Gigch (1974, p. 13)

their collaborators understand that activities are interdependent and the interaction between functions and different process steps are necessary for achieving a better result.

The system's performance depends on how its parts interact to each other rather than how they act separately (Ackoff, 1994). According to Melcher (1975), managers seek conceptual models covering each one of the several systems of any viable organisation. Bertalanffy (1968) stated that the general system theory seemed to be an important advance in terms of inter-disciplinary synthesis and integrated education, calling attention to an integrating and systemic action in the organisations.

Espejo *et al.* (1996) warn for the need to eliminate the functional units so that the organisations can be horizontally managed by processes and autonomic teams. However, this should not be limited to a given area but holistically carried out in order to deal with the full complexity of the organisation, thus avoiding the illusion of a total improvement from a local optimisation (Espejo *et al.*, 1996). Therefore, managerial practices should be created to seek new approaches capable to deal with the organisational complexities as well as the challenges. The BMP approach was created to manage the process-oriented organisations (Trkman, 2010; Wynn *et al.*, 2009).

The business process management

There are several definitions for process (ABPMP, 2009; Armistead and Machin, 1997; Davenport, 1994) in which the common features define it as a series of activities organised in order to transform inputs into outputs. To manage a process efficiently, it is necessary to know and locate the problems and solve them, focusing initiatives to the critical ones (Salhieh, 2007; Siriram, 2012), on an integrated basis by taking into account strategic objectives of the enterprise, as stated by the BPM approach.

The BPM is a managerial discipline focused on organisational management processes (ABPMP, 2009) in which improvement is continuously sought (Hung, 2006; Lee and Dale, 1998; Zairi, 1997) in a feedback cycle, thus ensuring both alignment to the organisational strategies (ABPMP, 2009; Hung, 2006; Lee and Dale, 1998; Zairi, 1997)

and achievement of the expected performance (ABPMP, 2009). According to Lee and Dale (1998), BPM should be linked with policy deployment and aligned with the critical objectives and company goals.

The capability of managing and improving the organisation's business processes on an ongoing basis (Armistead and Machin, 1997) represents an important determinant of its performance (Kohlbacher and Gruenwald, 2011), despite the lack of guidelines for the improvement procedure (Nwabueze, 2012; Zellner, 2011). In fact, BPM is an ongoing activity requiring performance measurement (Brocke and Rosemann, 2010; Hung, 2006; Jeston and Nelis, 2006; Lee and Dale, 1998; Zairi, 1997) and consequently is dependent on the alignment of business operations with organisational strategy (ABPMP, 2009; Hung, 2006; Jeston and Nelis, 2006; Zairi, 1997), operational elements (Zairi, 1997), use of modern tools and techniques (Zairi, 1997), personnel engagement (ABPMP, 2009; Hung, 2006; Jeston and Nelis, 2006; Lee and Dale, 1998; Zairi, 1997) and, the most important, a horizontal approach aimed at meeting the client's requirements as best as possible (Antonucci and Goeke, 2011; Lee and Dale, 1998; Zairi, 1997). According to Batista *et al.* (2008), this approach provides customer-focused business processes.

Life cycle and descriptions of the BPM phases vary depending on the authors, but despite of some differences in the activities, both order and execution time are the factors differing more significantly (Houy *et al.*, 2010). Thus, the majority of the cycles can be summarised by the set of activities represented in the cycle of ABPMP (2009), whose phases are described in Table II.

Specialised professionals, interested third-parties, functional leaders and others should be allocated to inter-functional teams (ABPMP, 2009). BPM affects all aspects of an organisation, promoting cooperative efforts by involving all the team (Hung, 2006). In this way, the processes are taken into account based on different points of view at all levels. According to the ABPMP (2009), the roles in the design of the processes, for example, include the following: executive leadership, process design processes, specialists, partners and interested third-parties, client, project manager, facilitator and owners of the process. Also, BPM provides an approach for integration through increased knowledge within the organisation (Armistead and Machin, 1997).

To perform the analysis, it is important to understand the process and its strengths and weaknesses as well as the results achieved. For doing so, one must understand the business environment, the organisational culture and context, performance metrics, interactions with clients, handoffs, business rules, information systems involved, process capacity, bottle necks, variation, process cost, human involvement, process controls, among others (ABPMP, 2009).

The implementation results can include the following: executable processes decomposed into detailed work, BPM metrics for performance evaluation, process management organisation with monitoring and documentation; possible use of BPM software; trained professionals, acceptance through change management and plan for continuous assessment of the processes (ABPMP, 2009).

From the main aspects related to BPM, the next section addresses the correspondence between its steps and generic systemic assumptions found in the literature.

BPM: a systemic approach?

The BPM approach needs organisational perspectives in order to adopt a set of common practices and procedures and obtain a holistic view for planning and managing business

Phase	Description
1. Planning	Development of both plan and strategy aimed at organisational processes. Understanding the strategies and goals of the organisation by providing framework and directions for an ongoing management of the client-oriented processes. The plan establishes the foundation for a holistic BPM approach to ensure an alignment with the organisational strategy as well as integration of strategies, personnel, processes and systems within the functional limits, establishing strategy and directions of the BPM process. Identification of the roles and responsibilities, executive sponsor, goals, expectations on performance measurements, and methodologies. If significant transforming activities are expected, then organisational and strategic changes will be analysed
2. Analysis	Understanding the current organisational processes within the context of desired goals and objectives. Assimilation of the information from strategic planning, process models, performance evaluation, changes in external environment and other factors in order to fully understand the business processes within the scope of the organisation as a whole
3. Design and modelling	Modelling involves the creation of representations of existing or proposed business processes by documenting the entire sequence of the activities in order to provide value to the client, defining what the process should be and answering questions such as: what, when, where, who and how. On the other hand, design involves the creation of new specifications for business processes already created or modified within the organisational context. Design defines what the organisation expects the process to be. Adequate metrics and managerial controls are defined too. In this phase the development of the process is documented, including improvements. In an iterative BPM lifecycle, the initial design activities can focus on standardisation or automatisation of the current *ad hoc* activities, or incremental improvements projected for optimisation. Understanding the process involves the modelling and assessment of the environmental factors which influence the process
4. Implementation	Performing the activities defined by the processes by adapting, if necessary, the current performance of the players
5. Monitoring and control	Providing information to managers so that they can adjust the resources according to the objectives, thus generating information on performance by means of metrics related to goals and value for the organisation
6. Refinement	Implementation of the results obtained from iterative analysis and design cycle. This involves the management of organisational change and improvement activities, including re-design or re-engineering resulting from analysis of the information on process performance. They are controlled in such a way that they can respond to environmental changes aiming consistent results

Table II.
The BPM life cycle

Source: Adapted from ABPMP (2009)

processes on an end-to-end basis (Antonucci and Goeke, 2011). This holistic view is needed to deal with business processes, which are sensitive to specific dimensions of each organisation, such as culture, governance, change management aspects, processes, control and technology (Antonucci and Goeke, 2011). In this sense, Armistead and Machin (1997) emphasise the need to develop methodologies to support a more holistic approach to BPM, and to directly consider the "process of managing processes".

Also, Armistead and Machin (1997) hold that the appropriate methodology for understanding processes in a higher level may lie in the field of systems thinking.

Because a process involves a work until the value has been given to the client, the processes transcend the traditional functional/departmental boundaries (Hung, 2006). The processes are focused on the end-to-end work (Armistead and Machin, 1997; Brocke and Rosemann, 2010; Kohlbacher and Gruenwald, 2011), whereas functions are focused on individual tasks. BPM requires the ability to critically evaluate situations from cross-functional perspectives (Seethamraju, 2012). Therefore, processes require a significant engagement of the organisation as new roles and responsibilities are introduced (ABPMP, 2009). In addition, the functional approach creates barriers impeding the client's satisfaction (Zairi, 1997). Batista *et al.* (2008) point out that, despite the efforts to manage end-to-end processes across business units, few companies are successfully accomplishing it. In this sense, Paim *et al.* (2008) state that one of the main motivations for implementing BPM is the capacity to overcome the limitations of the functional approach in managing organisations.

Harmon (2007) argues that the enterprise's functional view is focused on dividing the processes into activities attributed to specific departments, thus reducing the global performance of the organisation. The main reason is that there is no management of the relationships between departments, which generates antagonistic or even conflicting objectives in the organisation, thus making it difficult to perceive how each part contributes on aggregating value to the client.

The organisation is connected through processes, requiring balancing resources such as people, processes and systems on an organisation-wide basis (Siriram, 2012). We live in a networked society, where technologies converge and firms collaborate, creating better opportunities for performance (Siriram, 2011). The "professional space" of BPM is characterised by components which can be divided into three levels: external environment, internal environment and the organisation itself (ABPMP, 2009). Within this context, impacts and influences on BPM extend beyond the organisation and consequently they need to be considered so that its business processes can be holistically viewed (ABPMP, 2009). Therefore, the systemic view is intrinsically related to the process approach, since it provides a holistic view of the processes (Antonucci and Goeke, 2011; Brocke and Sinnl, 2011; Hung, 2006; Niehaves and Plattfaut, 2011) allowing not only the parts but also the whole to be analysed. Moreover, external and internal relationships between strategy, personnel, processes and technology are also considered in order to achieve the business objectives (Hung, 2006).

Table III lists the main BPM-related concepts found in the literature by analysing their corresponding systemic assumptions.

Organisations have a general trend towards specialisation. In this sense, BPM represents a more systemic approach (Brocke and Sinnl, 2011; Niehaves and Plattfaut, 2011), seeking homogenisation of knowledge and thus avoiding excessive specialisation (ABPMP, 2009).

The fact that BPM involves inter-functional teams, promoting cooperative efforts and considering different points of view at all levels by involving all the team agrees with the assertion of Forrester (1958) that a systemic approach, considering companies as complex systems, would lead to changes in management responsibilities, with the merging of many line-and-staff functions.

Table III.
The relationship between BPM-related concepts and corresponding systemic assumptions

BPM-related concepts	Systemic assumptions
Process as a set of activities aimed at transforming inputs into outputs with value aggregated (ABPMP, 2009; Armistead and Machin, 1997; Davenport, 1994)	Enterprise as an open system, i.e. it receives inputs from the environment, process them and return them before re-beginning (retroaction) the basic cycle – input, processing, output (Ackoff, 1994; Beer, 1966; Gigch, 1974; Bertalanffy, 1968)
Ensuring the alignment with organisational strategies (ABPMP, 2009; Hung, 2006; Lee and Dale, 1998; Zairi, 1997)	A system has a coherent pattern which ensures a sense of wholeness formed by the interacting parts (Müller-Merbach, 1994). This coherent pattern can be viewed as a common purpose or as common objectives (Arregui, 2001). The whole has one or more defining functions in a system (Ackoff, 1994)
Feedback for ongoing improvement of the processes (Hung, 2006; Lee and Dale, 1998; Zairi, 1997)	Existence of positive and negative feedback in the systems (Mingers and White, 2010). According to Goh *et al.* (2010), one of the keys of systemic thinking is to recognise the circular nature of the majority of the systems
Objective of aggregating value to the client (ABPMP, 2009; Lee and Dale, 1998; Zairi, 1997)	It is the awareness of the progress towards self-established goals that makes human existence an upper system in the hierarchy of the systems and organisations as well (Gigch, 1974). The whole has one or more defining functions, such as a purpose for the existence of the system or a common objective (Ackoff, 1994)
Horizontal focus on the end-to-end work (ABPMP, 2009; Antonucci and Goeke, 2011; Armistead and Machin, 1997; Hung, 2006), going beyond the functional limits (Paim *et al.*, 2008) and allowing the whole and its parts to be viewed (Antonucci and Goeke, 2011; Brocke and Sinnl, 2011; Hung, 2006; Niehaves and Plattfaut, 2011)	Focus on how the studied object interacts with other components of the system to which it belongs (Müller-Merbach, 1994; Skarzauskiene, 2010). Construction of full images of the phenomena rather than dividing them into parts (Flood, 2010)
Possibility to analyse the organisational processes at several levels by decomposing the work (ABPMP, 2009)	Recursivity and hierarchy of the systems as well as analysis of the parts, the whole and its subsystems are fundamental concepts of systemic thinking (Mingers and White, 2010; Müller-Merbach, 1994)
Planning involving the understanding of the organisational strategies and goals (ABPMP, 2009)	Awareness of the progress towards self-established goals makes human existence an upper system in the hierarchy of the systems and organisations as well (Gigch, 1974)
Integration between strategy, personnel, processes and systems (ABPMP, 2009; Hung, 2006)	Relationships or interactions between elements are more important than the elements themselves for determining the system's behaviour (Mingers and White, 2010; Müller-Merbach, 1994). The parts are needed but insufficient to meet the purpose of the whole (Ackoff, 1994)

(*continued*)

BPM-related concepts	Systemic assumptions
Concerns with change management (ABPMP, 2009)	View of the change processes is part of the essence of systemic thinking (Skarzauskiene, 2010)
Involvement of inter-functional teams with participants of all levels (ABPMP, 2009; Hung, 2006)	Accepting, especially in social systems, that people will act according to distinct purposes or rationalities (Mingers and White, 2010)
Analysis of the external environment, organisational culture and preoccupation with the organisation's capacity to respond to environmental changes (ABPMP, 2009)	The relationships between system, boundaries and environment are key concepts of systemic thinking (Mingers and White, 2010). View and understanding of the context is part of the essence of systemic thinking (Müller-Merbach, 1994; Skarzauskiene, 2010)
Analysis of the processes and inter-relations between them, including control transfer points (ABPMP, 2009)	Systems have a set of parts or elements which interact to each other (Arregui, 2001). The way how behaviour or properties of each part affects the behaviour or properties of a system depends on the behaviour or properties of at least another part of the system (Ackoff, 1994)
Concerns with development of ideal models (ABPMP, 2009)	Managers seek conceptual models covering each one of the several systems which form any viable organisation (Melcher, 1975)
Indicators of performance related to goals and value to the organisation (ABPMP, 2009; Hung, 2006; Zairi, 1997)	The concepts of information and control are a field of cybernetics, being part of the systemic thinking (Bertalanffy, 1968). Communication and control features are directly related to the idea of survival of the system (Arregui, 2001)
Each participant knows his or her role for value creation, understanding the process as a whole (ABPMP, 2009; Antonucci and Goeke, 2011; Brocke and Simnl, 2011; Hung, 2006; Niehaves and Plattfaut, 2011)	Viewing the situation holistically, in opposition to the reductionism, as a set of elements interacting with the environment (Mingers and White, 2010). Each part of the set can affect the behaviour or properties of the whole (Ackoff, 1994). The parts are needed but not enough to meet the purpose of the whole (Ackoff, 1994)
Understanding the business rules of the information systems and the capacity of the process, including possible bottle necks (ABPMP, 2009)	The performance of a system depends on how its parts interact to each other rather than on how they act separately (Ackoff, 1994)
Holistic view of the business (Antonucci and Goeke, 2011; Armistead and Machin, 1997; Brocke and Simnl, 2011; Hung, 2006; Niehaves and Plattfaut, 2011)	Holism is a key concept of systemic thinking (Mingers and White, 2010; Müller-Merbach, 1994)

Table III.

Some critics can argue that the Cartesian method of analysis of organisational processes, separating the process into sub-processes and activities, can mislead the analyst into a view of the process as a whole. Nevertheless, such an analysis can take into account the inter-relationships between sub-processes, process, the enterprise as a whole, and its environment, since the parts do not work independently and have a beginning or an end in other parts of the system, and so on. In fact, the analysis of processes does not disregard the environmental influences, but the analyst can do it depending on his or her interpretation, which is guided by the subjectivity. Thus, BPM has different modelling approaches, including a top-down one, whose orientation comes from the view of the whole and successive unfolding (ABPMP, 2009). From this perspective, it is possible to focus on inter-relations and the purpose of the system as a whole.

BPM presents with a solution based on the systemic thinking (Brocke and Sinnl, 2011; Niehaves and Plattfaut, 2011), since the concept of systemic view is applied through the lifecycle steps of BPM aiming to generate value by the interdependence between the parts of the organisational system. In this sense, Siriram (2012) suggests a BMP approach which strengthens the focus on crucial processes for strategy and goals, besides allowing real sources of problems and other systemic aspects to be identified in the BPM approach.

Final considerations

By analysing the main BPM-related concepts found in the literature, it was possible to make a parallel between them and the systemic assumptions cited in the literature. Therefore, BPM can be thought as an approach with some systemic characteristics, thus being an alternative to the traditional functional and reductionist management approaches. BPM includes a series of systemic aspects, such as:

- Enterprise is viewed as an open system, with inputs, processing and output.
- It ensures alignment with the strategies by recognising the existence of a pattern or common purpose between the parts.
- Feedback is valued for improving the processes, thus recognising the circular nature of the system.
- It is focused on integrating the activities and their inter-relationships.
- It goes beyond the functional limits, allowing a full image of the organisation and processes to be constructed.
- Organisational processes are analysed in levels, thus highlighting recursivity and hierarchy of the system.
- It involves inter-functional teams aimed at dealing with different rationalities.
- The external environment and culture of the organisation are analysed, including its relationships with boundaries and context.
- Search for viability through conceptual models.
- Indicators of performance are related to goals, thus serving as control mechanisms.
- The role of each part of the process is understood as a whole, allowing a global view of the system.

Therefore, BPM is shown as an approach allowing several aspects of systemic thinking to be applied to organisations, thus meeting in a practical way the demands imposed by a complex and globalised environment. However, when analysing processes and modelling them, the inter-relationships must be considered critical, as the environment involved. This way, BPM can apply some systemic characteristics.

The paper presents practical implications, contributing to professionals as well as academics, since it elucidates the transition from functional management to process-orientated management and suggests the application of BPM from a systemic approach. The understanding of each part of the process while considering the whole system aligned to reach the same purpose of meeting the client's needs can contribute to the improvement of the organisation's performance. As processes are directed to the same goal, and searching for continuous improvement, unnecessary and misdirected steps are redesigned or eliminated, concentrating resources on core processes. The paper also contributes to education, since the systemic approach may be a key subject to clarify the inter-relationships among processes, and processes and their contexts, allowing students to experience the systemicity of real world problems and suggesting the inclusion of systemic concepts to disciplines.

The originality of the present study relies elucidating the systemic characteristics of BPM, conferring an academic value as it helps to justify studies on such an approach in addition to contributing to the characterisation of its basic assumptions. Besides, the value of the work for the business context resides in the identification of a practical approach which can be applied to organisations in order to ensure them systemicity and flexibility.

The present study has not been meant to complete the list of characteristics of both BPM or systemic thinking, but to suggest a bibliographical research on the state-of-art of both themes in order to deepen the comparison in future works, even suggesting other systemic aspects to be included in BPM approach. Because the research is based on unstructured literature review, conclusions must be seen against this background.

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