Social Media Software Underpinning Business Processes in Higher Education Institutions

ABSTRACT

Most organisations constantly seek new ways to improve performance, to meet market demands and to achieve their business targets. This constant search usually results in a large number of projects designed to improve their processes. But there are new needs, in addition to managing structured processes. The understanding of these needs is critical to the modelling and implementation of business processes.

BPM (Business Process Modelling), referred as the modelling of business processes in organisations, suffers from many defects, such inability of addressing human behaviour and weakness in handling exceptions. Furthermore, it is common to have organisations with very well defined business processes that no one uses.

Social networks support new ways of communication patterns among people. Social media software (SMS) is a media application for social interaction, using highly accessible and scalable publishing techniques.

Using blogs, wikis or any other kind of social media software, stakeholders can provide information for the organisation, capture and share their ideas for new products and features. These concepts and tools become essential for the implementation of business processes in organisations.
This paper discusses how SMS can underpin BPM in modelling business processes inside organisations.
This work emphasis a proposal of a case study module process framework application in a higher education institution and explains the involved phases and the desired and expected results.

1. INTRODUCTION

All organisations have a purpose, which involves providing services or producing goods. The set of activities needed to accomplish this goal is called a process. Manage processes effectively has become a differentiator in terms of productivity for private business and a crucial factor for the institutions.

Public institutions have a large number of administrative processes, some poorly designed or ineffective. Currently, the Public Institutions are automating services to shorten the distance between the institution and the citizens. Through the use of technologies related to information and communication has been possible to link different sectors of different public institutions in order to provide the accumulation of a large number of services in the same physical space.

To expand the progress made, the processes must be structured so as not to perpetuate problems in the digital modelling process shows up as an opportunity to improve these processes before automating them, providing analysis and redesign them, and identifying correcting its flaws and redundancies.

Business Process Modelling (BPM) in systems engineering is the activity of representing processes of an organisation, so that the current process may be analysed and improved. BPM is typically performed by business analysts and managers who are seeking to improve process efficiency and quality. The process improvements identified by BPM may or may not require Information Technology involvement, although that is a common driver for the need to model a business process, by creating a process master.

Change management programs are typically involved to put the improved business processes into practice. With advances in technology from large platform vendors, the vision of BPM models becoming fully executable (and capable of simulations and round-trip engineering) is coming closer to reality every day.

Social networks enable new forms of communication patterns between people. Social media software (SMS) is a media application for social interaction, using editing techniques very affordable and scalable. By using blogs, wikis or any other type of software social media, stakeholders can provide input into the organisation, capture and share their ideas for new products and features. These concepts and tools become essential to the implementation of business processes in organisations.

SMS has had a strong increase in use by a wide variety of users, representing an increasingly influential role in social and cultural life of people. So, it is subject of reflection to identify the main reasons to use social networks as well as enjoying the activities and their characterization by students in higher education institutions. The main motivations that lead students to use social networks are contacts with friends and entertainment. They have very favourable opinions about social networking, highlighting the main potential ease of use, quantity and variety of available resources and the development of personal contacts.

The penetration of SMS in institutions of higher education worldwide is phenomenal. Instant messaging, blogs, wikis, discussions and comments on the media sometimes with extreme candour are the norm. This means a new generation of entrepreneurs will enter the labour market, expecting the same kind of openness, exchange, and rich experience that they were accustomed. They will continue the social networks through popular portals, but inevitably, social networks will be brought to the workplace and accepted as the cultural norm, representing the second generation web.

The educational community is interested in allowing students to demonstrate their learning outcomes through the creation of content in these new platforms, notably to engage students and develop their skills, increase capacity and critical peer review and creative ability, simultaneously with the aim of improving the skills of written expression (Gray, Thompson, Sheard, Clerehan, & Hamilton, 2010).

Instant messaging and other social networking tools are becoming essential in the company. These tools are emerging as key elements in corporate portals. Each organisation has a portal, and increasingly these portals are using social networking aspects. The portals are making the environment where employees can interact through discussion topics, express their opinions in blogs and wikis to collaborate in the creation of the relevant business. The organisation is to encourage and foster communication and innovation through social networks inside the firewall.

The success of social networks was mainly due to the immense possibilities of information sharing and collaboration, offering new opportunities not only personally and professionally, but also to the educational level.

2.   BUSINESS PROCESSES

The information era has achieved great prominence within the institutions. This is a reflection of current society, where information is seen as a precious asset that must be maintained and exploited to the maximum. Organisations have realized the need to know and control their processes focusing on the information involved, which helped them to understand their own business, identifying their real needs, aiming to increase competitiveness, total quality, productivity and efficiency.

Business Process Management is the achievement of an organisation's objectives through the improvement, management and control of essential business processes (Jeston & Nelis, 2008).
Business processes are a set of structured activities and metrics designed to result in a specific product for a particular customer or market (Mac KNIGHT, 2004). Processes can also be grouped into macro-processes or sub-divided into processes, depending on the need.

Business Process Management aims to provide the alignment of business processes with the strategy, with goals and create a value chain for the organisation. The Management of business processes uses the best management practices, such as processes mapping, modelling, determining the level of maturity, documentation, communication plan, automating the monitoring, establishment of performance indicators and the cycle of continuous improvement (Gonçalves, Paulino, & Silva, 2010).

BPM (Business Process Modelling) suffers from many defects, the inability to deal with human behaviour and weakness in handling exceptions. Moreover, it is common with organisations business processes very well defined that no one uses. It is usually a diagram representing a sequence of activities, usually shows events, actions and connections or connection points, following from beginning to end. It is multi-functional, often combining work and documentation of more than one department within the organisation.

In more complicated situations, BPM can also include activities outside organisations processes and systems that feed the primary process. In the operations of large organisations in business process models tend to be analysed and represented in more detail than in small organisations because of the size and complexity.

Business process may be organized as views of around four types: deterministic machines, complex dynamic systems, interacting feedback loops and social constructs (Melão & Pidd, 2000).This fourth perspective emphasizes business processes as made and enacted by people with different values, expectations and their agendas.

The social constructs view of business processes implies that business processes are not oriented to the objective and concrete sense as in the previous perspectives. They are abstractions, meanings and judgements that people put on the real world, which result from a process of subjective construction of the minds of people. The focus here is on subjective and human aspects of the business process (Melão & Pidd, 2000).

From this standpoint, a business process can be defined in terms of different perceptions constructed by various individuals and groups as a result of different frames of interpretation. These frames, shaped by beliefs, values, expectations and previous experience, act as filters enabling people to perceive some things but ignore others. For example, a production manager may regard an order fulfilment process as a way to ensure that the orders are manufactured on time, while a marketing manager may regard it as a way to satisfy a customer's needs. The existence of multiple (and often conflicting) views about what is going on and about how the process is being and should be carried out means that a different view of change is required. It implies that changes should result from a process of negotiation of conflicting interests, difficult though this process may be (Melão & Pidd, 2000).

The social construct view of a business process fits well with strategic, less tangible processes, in which human activity is the major driver, such as health, social and educational services. Approaches for BPM are business-centric rather than technology-centric, although connections to designs and implementations (for example, via mappings to software architecture elements such as Web services) are also desirable. Hence, business models, business processes, and software architectures need to be developed in an integrated manner (Weiss & Amyot, 2005)(Figure 1).
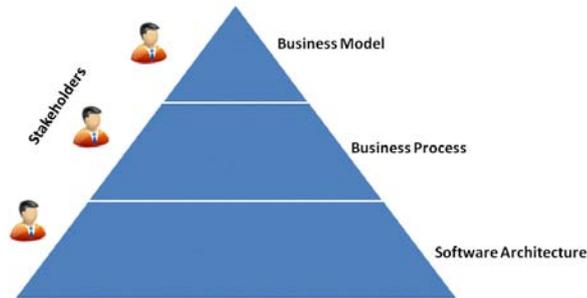
Figure 1- Three aspects of Business Process Modelling (Weiss & Amyot, 2005)

Currently, business process modelling has been used to benefit the manipulation of information. In this context, it emerges as an ideal approach to help organisations more effective administrative control, facilitating the assessment of the situation of the organisation and identifying their real needs, and serve as a basis for identifying potential support systems to processes. It thus becomes increasingly common to find organisations that model their business processes by obtaining a greater knowledge of their internal structure and needs.

Business processes modelling of is a set of concepts, models and techniques with the aim of developing the business model of the organisation. This model is the result of an abstraction of the organisation, considering its essential features, from the standpoint of the business. Its goal is to answer the following questions about the organization: What is done? Who does? When? Where? Why? How? – Figure 2 (Weiss & Amyot, 2005) (Amyot & Weiss, 2006)
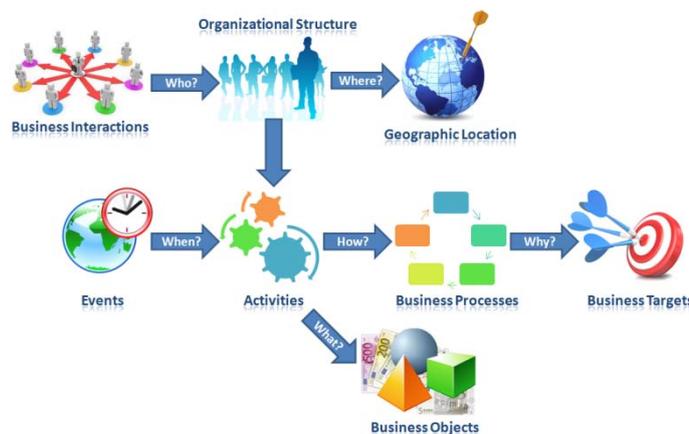

Figure 2- Questions answered by the business model (Mac KNIGHT, 2004)

The social constructionist viewpoint, when considered as the sole basis for modelling business processes, may also have its own difficulties. First, the stress on "cultural feasibility" may impede the attainment of more efficient and radical designs. Secondly, this perspective alone is unable to provide an objective, quantitative assessment of business process changes (Melão & Pidd, 2000).
Not all stakeholders, especially the users, may be properly involved with business process modelling. This may be caused by the exclusion of users by organisation means or by creating thresholds through the use of a formalized modelling tool. Thus, the users are only "consumers" who are forced to accept the processes created for them. Also, the inappropriate unification of terms by a top management-driven approach instead of a peer-to-peer basis may create a model–reality-divide (Erol, et al., 2010).

3.   SOCIAL MEDIA SOFTWARE AND SOCIAL NETWORKS

Social software supports social interaction and social production and raises the level and scope of the interaction facilitated by computer and computer networks (Erol, et al., 2010).

Social software not only considers the content but also the context as valuable. Therefore, many types of social software also support creating context (usage) information for a physical or digital object in the form of tags, links or bookmarks. By capturing the context of information, not only semantics but also the pragmatics of information can be represented. Many different types of content are possible such as text, (web) documents or multi-media. Three sub-types of context may be differentiated: annotation, reputation and social links. Context can be expressed by different technical means such as text and links (Erol, et al., 2010).

Social media software (SMS) is a generic term encompassing a set of tools and applications that enable interaction and communication via the internet. Thus, it has a focus on creating online communities, and includes all types of online communication platforms. SMS may be classified as (Murugesan, 2007):

- Participation: the content is created and organized by ordinary users rather than organizations;
- Interaction: applications available on the Web interfaces provide rich as desktop applications;
- Community / collaboration: the more such tools, the better they get, and social network effects emerge.

However, the social tools have long found their way to support dispersed teams. New generation SMSs are:

- Blogs: they represent the simplest way to create common user to a page where the content is added in the form of messages displayed in a reverse chronological order (Murugesan, 2007). Compared to traditional Web pages, the novelty lies in the possibility that readers can post comments linking blogs.
- Wikis: they can be considered as a simple web-based collaborative authoring system. Unlike blogs, a wiki cannot distinguish between the reader and writer, let anyone create and edit content in the form of wiki pages. Key features include wiki and historical versions of the document, which allow users to track changes.
- Social networking: social networking pages support the user in defining a digital identity by creating profiles and contact networks (Churchill & Halverson, 2005). As examples we have the most popular Facebook, LinkedIn and MySpace. Creating and maintaining a personal profile of public access plays a crucial role since it serves as a testimony digital self-presentation, not only to their existing friends, but also to new friends.
- Others: there are countless other applications that can be considered as social software. Mashup services, for example, combining data and services from different pages in a single access point, offering new features. When you open the data and combining different information quickly in new interesting ways, mashups can effectively exploit the large amount of user-generated content available through SMS applications.

SMS is now emerging as an economic and practical option to improve communication. Blogs and Wikis are particularly valuable in distributed projects by global teams that can use them to publish their work. Recently, the use of these applications has become quite common, especially for software projects. Blogs represent a valuable tool for exchanging information among team members and facilitate the sharing of knowledge. The traditional software development as it involves the dynamics and evolution of communication based on social networks.

4. BUSINESS PROCESSES AND SOCIAL MEDIA SOFTWARE

For a business to be successful in the modern world, it must use all available business support tools.
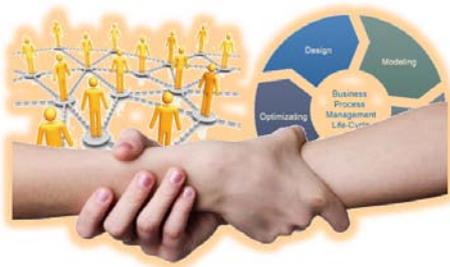

Figure 3- BPM and SMS

The SMS has the potential to improve an institution, transforming business processes into office against the outside world, for example, recruitment, marketing, customer relationship management and knowledge management.

Due to sharing real time information, SMS has the potential to bring competitive advantage. SMS has ability to add value by solving customer problems and by increasing involvement with stakeholders. May even change the internal processes and make them more efficient (Figure 3).

Institutions are able to look at twitter pages to see the reactions to their products and create an advertising campaign more effective. They can learn about customers through forums and decrease the risk of losing customers by taking immediate actions to respond to any negative comment. At the same time, the person responsible for the establishment of social networks can move the discussion in the right direction if his reputation is threatened.

SMS is based on the idea of common areas shared by many individuals. This type of software is mainly used for informal communications. The SMS and processes are not unlikely companions. They really work well together. Processes can never explain all the details and critical exception. SMS is the most powerful tool yet devised to help empower people to fill those gaps. This is one of those rare cases where the whole is really greater than the sum of its parts. The question is how to bring these two different worlds in order to achieve the benefits of SMS to the modelling of business processes.

While BPM are implemented to support the business processes and are structured so that certain objectives could be linked, the SMS were mainly designed to provide a forum for interaction between users without any intention oriented. However, SMS aim to produce specific articles, which invite users to participate in goal oriented activities.

While BPM are usually used to support the distribution of structured work management from top to bottom, the use of SMS is driven by the initiative and motivation of participants in the process themselves.

One of the best things that brought the SMS was the possibility of communication. If it is published something, for example, a photo album, and available to as many people wanted, it is possible to invite them to visit the space. If we turn our attention to systems to support process modelling, communication is not a primary objective. The focus is on achieving the goal set to an instance of the communication process with the least possible interactions in order to be effective. For shared spaces support, it must be found first its possible role in the execution of business processes.

5. CASE STUDY

To underpin business processes with social media software it was implemented a case study in a School of Higher Education: the Polytechnic Institute of Setúbal - Superior School of Technology. It consists in a module process framework that analyses a compilation of inputs from a specific forum or social network, create to capture ideas about some business processes.

The target population of this framework are the stakeholders of the School, therefore, students, teachers, the school top and middle managers and general staff because business process uses them in different perspectives and contexts. They know the way things are done or can be done and are the interested people in business process improvements, especially if they reduce time or effort.

The start point is to create a direct question in the forum, or post a comment about a certain business process. The question types can be: "In your point of view, what could be..."; "Do you think it should be..."; "What is your opinion about..." i.e., questions that can motivate to a discussion or interaction meta-oriented. The starting topic can also be an opinion about a certain problem and an idea to resolve it or a business process complain. Hoping for discussion about the topic is the next step to try to extract some information and sometimes insert further post to guide the discussion, if necessary. It's important to keep minimum interaction with the topic, and try to gather pure and "uncontaminated" posts with our point of view or "way of doing things".

The case study modules process framework (Figure 4) makes the typification of the words/verbs or phrases that show an opinion, suggestion or idea that has something about a business process like: "think", "should be", "In my opinion", "I am not happy", "perhaps" and having value-judgment about a certain process is implemented or should be. Abbreviations and specific internet/text-messaging forms of expression are also considered.

Analysing the statements we can identify also (in certain cases) the negative or positive judgment or idea about the way the process is being executed or should or not be, for example: "It is the wrong way...", "Why not", "Why do we have to...if...".

It is possible to analyse the topic as it still is open, but for richer information, the analysis is made after closing the topic. Our approach to the analyses consists in compiling the various posts from a topic in to a single text file, in order to have only one input in to our interpretation module. In fact, every post tends to be about one topic, but it can have information about different areas of the business process, our different opinions about it, and most times the various posts are the responses to previous posts. The compilation is made to a single file, but it requires basic transformation.

Understanding the business process area is another task of the interpretation module. One of the first configurations of the collection module is the definition of keywords to have special attention, for example: "Secretariat", "Timetables", "fee", etc. It is important because, sometimes, other keys (not configured) are referenced in the posts and the module has to isolate them into secondary posts, normally indicating that the discussion is being driven in another direction and needs to be oriented again, or simply because it can be an input to other topics, created or not.

So the output of the Collection Module is and XML formatted file, identifying the topic, keywords, the sequence of posts and, obviously, the posts itself. No personal information is gathered, except the function of the poster (Director, Teacher, Student, etc), if filled in the user profile.

The input of interpretation module is the XML file. This is the more elaborated module because it needs recognition of regular words, slang and abbreviations, grammatical and orthographical errors. Has said before, some words and phrases are categorized by type of opinion and if it they are positive or negative opinions about the subject of the topic. This modules needs to "understand" and isolate ideas about a certain area of the business process, so, identifying the keywords in every posts is essential, starting by the first post. After this identification, it starts the process of analysing the sentences, identifying positive and negative ideas and opinions and transforming into to simpler text. For example:

"My timetable is better than the last year"

"Making our timetable in this school is very easy"

"I think it's better to have fixed timetables"

"Why don't we have a form to choose our timetable?"

The output of the Interpretation Module is the input for BPAnalisys Module.

To transform the various posts of data into information some analysis needs to be done. This process is made by an Information Analyst and Process Designer that know the actual Business Process or intends to implement a new one. This process is made by automatically group the keywords of the topic, then by positive or negative "opinion" finally by type of "opinion" so the analyst can have the structured view of data. The next step concerns human analysis and design.
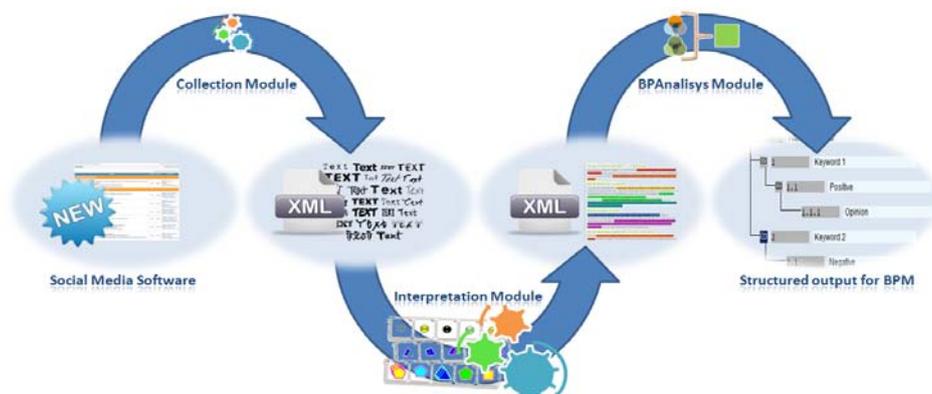

Figure 4- The case study modules process framework

To clarify certain aspects of the process engineering or reengineering are used process oriented surveys or launched a new topic in the forum oriented only to that portion of the process.

Survey example:

What type of timetables do you prefer?

□ *Fixed*

□ *Adaptative*

The expected results with this framework are a better understanding of the business process in the stakeholder's point of view, improvements in business process that can be on reducing time, effort or resources. It can also help on defining new business processes with richer information or to have the perception that a business process has to be designed to establish procedures.

Improving business processes, especially those connected directly to students, they can improve curricular units attendance, therefore, better grades. Improvement in school marketing image is also expected to try to capture new students to the School. Internally it is expected to improve communication between the stakeholders, efficient adjustment of resources and simpler and faster business processes.

6.   CONCLUSIONS AND FUTURE WORK

Combining business process management and social software offers new opportunities for the design of business processes. Thus, when designing a business process, one should consider how it can be supported with the novel instruments provided by social software.

This paper discusses how business process modelling in organisations may benefit of social media software. The main objective is to find the integration of BPM with SMS in order to combine their respective benefits.

Future works will emphasis on the results of the case study application of the "modules process framework" in the higher education institution, and the validation of the obtained results. Using those results it will be possible to improve the framework and to improve existing business processes inside the organisation.

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