A Norm-based Approach for Profiling Business Knowledge

Nazmona Mat Ali and Kecheng Liu

Abstract—Knowledge is a key asset for any organisation to sustain competitive advantages, but it is difficult to identify and represent knowledge which is needed to perform activities in business processes. The effective knowledge management and support for relevant business activities definitely gives a huge impact to the performance of the organisation as a whole. This is because that knowledge have the functions of directing, coordinating and controlling actions within business processes. The study has introduced organisational morphology, a norm-based approach by applying semiotic theories which emphasise on the representation of knowledge in norms. This approach is concerned with the identification of activities into three categories: substantive, communication and control activities. All activities are directed by norms; hence three types of norms exist; each is associated to a category of activities. The paper describes the approach briefly and illustrates the application of this approach through a case study of academic activities in higher education institutions. The result of the study shows that the approach provides an effective way to profile business knowledge and the profile enables the understanding and specification of business requirements of an organisation.

Keywords—Business knowledge, Business process, Norms, Semiotics, Organisational morphology

I. Introduction

IN the present dynamic and fast-paced environment, the need for knowledge and its management is crucial for individuals and organisations. This is because knowledge is seen as a key asset which helps organisations in leveraging their competitive advantages. However, most organisations recently focus on knowledge being produced by their business processes, while knowledge is also significantly used as input for performing activities in business processes [1]. This type of knowledge is often referred as business knowledge which provides guidance to people in making judgements, formulate decisions and perform activities [2]. Most importantly, this knowledge is closely related with business process which crucially acts as an enabler to perform that those processes within an organisation. In general, each business have individual business processes, each process has a number of activities that performed in some order and often conducted by an agent (e.g. a person, group, organisation, software or physical artefact). This process consequently leads to the accomplishment of an organisation's goal. The lack in identifying and supplying business knowledge therefore gives a huge impact not only on the specific business process but can also affect more than one organisational unit.

Semiotics, the theory of sign has brought a helpful perspective into business process by defining an organisation as a system of social norms.

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These norms allow a group of people to act together in a coordinated way for certain purposes. Indeed, norms are capable in providing guidance for members of an organisation in their behaviour, thinking, judgement-making and perceptions of the world. Therefore, through organisatinal morphology as the method in semiotics has initiated that knowledge is best represented in norms that can primarily facilitate the use of knowledge. This includes knowledge that can be shared, codified and distributed to other members in an organisation. The method studies the structures and functions of an organisation by distinguishing the essential activities from the inessential activities. It is then followed by identifying norms that are associated with those activities and represents them explicitly in a formal representation. The main outcome from this study is a business-related knowledge profile that can be used to govern members to act effectively according to business process they involve. Moreover, this profile plays an important role which can be utilised by the organisation to redesign their business process and organisational structure to meet the new business requirement.

The paper is organised as follows: Section 2, the foundational concept of semiotics and its process called as semiosis is briefly discussed. Next, section 3 describes the existence of norms in organisations either informally, formally or technically. This is followed by a brief description of organisational morphology that is primarily employed in this study. Section 5 illustrates the use of the method by applying it to the activities of academic members in higher education institutions context. Finally, concluding remarks and future works are presented in section 6.

II. Research Background

A. A relationship between signs and norms

Semiotics is the study of signs and one of the well-known contributors in this theory is Charles Sanders Peirce (1839-1914). Peirce's main contribution is on the interaction between a sign, object and interpretant. These three elements are strongly correlated and interdependent with each other as illustrated in Fig. 1.
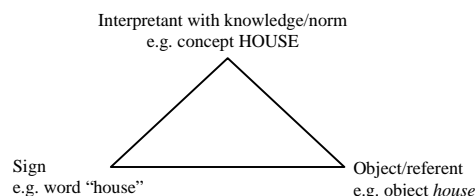

Fig. 1. Peirce's semiotics triangle, semiosis

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A sign can be anything, including numerical and alphabetical characters, words, sentences, messages and behaviours. It is important for a sign to hold a meaning which the sign refers or what the sign stands for. This will be accomplished by the object that gives a meaning for the sign. At the same time, the link between elements, the sign and the object is always dependent on the interpretant. For Peirce, an interpretant is not an interpreter but rather the sense made of the sign. In other words, the interpretant is the concept that represents the sign. The notion of interpretant however needs a human's role for the sign to make sense. For Liu [3], there is always someone involved, that is, to whom the signification makes sense. In fact, according to Chandler [4], the role of the interpreter must be accounted for either within the formal model of the sign or as an essential part of the process of semiosis. Generally, the interpreter will interpret the sign based on the particular context and norms they possess. Therefore, in a semiosis sense, the union of two basic concepts, sign and norms, is essential to make something meaningful and significant. The relationship between both signs and norms has been quoted by Stamper [5] as below and shown in Fig. 2.

"*To recognise when a norm should be triggered, the subject needs information (signs) relating to the condition. The resulting attitude may not produce an immediate outcome but sooner or later will be revealed in words or comportment, or sometimes translated eventually into action. In either case the result will be more signs.*"
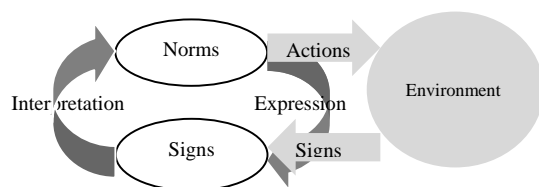

Fig. 2. The relationship between signs and norms [5]

Fig. 2. shows both the signs and norms are complementary to each other since norms can be expressed in all kinds of signs (e.g. documents, oral communication or behaviour) which in turn be treated as signs in another process of semiosis. At the same time, signs can be interpreted into meaningful interpretation when they trigger norms in the mind of interpreters which directly affects to whom the sign makes sense.

B. A notion of knowledge as norms

The word knowledge often be misunderstood since it has many meanings depending upon the speaker and listener's interpretation of the context within which it is spoken and heard [2]. This terminology is still vague and not clearly defined until today [6] [7]. In fact, Alvesson and Karreman [8] claim knowledge as ambiguous, unspecific and dynamic phenomenon, and therefore difficulty to manage. In the contrary, knowledge is easily understood and later managed if it is represented as norms. A norm can be considered as a field of force that makes people tend to behave or think in a certain way and shared by members of a community [9]. In order to preserve, spread and follow those norms, they can be articulated in all kinds of signs such as documents, oral communication or behaviour. The representation of knowledge in norms therefore can facilitate the use of knowledge which directly governs people to perform business processes.

Furthermore, according to Braf [10], *a norm is knowledge concerning value standards for action and governs human behaviour*. Norms is thus believed to have functions in assisting people to understand how an organisation works (e.g. who and should act, what should be done and when it should be happen). Here, the accentuation of norms is precisely coherent with knowledge that here is referred as business knowledge.

C. A functional views of norms

In general, the terminology of morphology is initiated from the biology discipline which deals with the structure of animals and plants. This concepts is then adapted into organisational theory to study the structure and functions of an organisation, called as organisational morphology. However, unlike the conventional view of organisational structure, this approach distinguishes an organisation's activities for a particular process into three types of norms: substantive, communication and control norms. Note that, each activity has its own norms that associate with it and thus norms should be found in any business processes of an organisation.

Substantive norms are concerned with the essential tasks of an organisation whereby conforming those norms will directly contribute to the achievement of the organisation's goals. Communication norms, also known as message passing emphasise on how to inform relevant people about relevant facts, work procedures and what actions are to be taken as well as when and by whom. This type of norm is usually carried out through activities such as announcements of events, sending letter, and emailing and telephoning to remind people of any activities. Substantive and communication norms at the same need another type of norms called control norms to monitor and evaluate those both norms in order to ensure that the organisation's goals are achieved. These three types of norms therefore tend to complement each other. Control norms are usually executed through implementation of rewards and punishments which indirectly guide members within an organisation to what they are supposed to do.

In addition, each type of norms can be further divided at a more detailed level, for example substantive message norms (x.m.s), messages about messages (x.m.m) and control of messages (x.m.c) as illustrated in Fig. 3. This in fact applies the concept of recursion, where communication or control norms can in their turn be treated as substantive norms. The level of detail however depends on the context where it is applied and on what is adequate for the purpose of analysis.
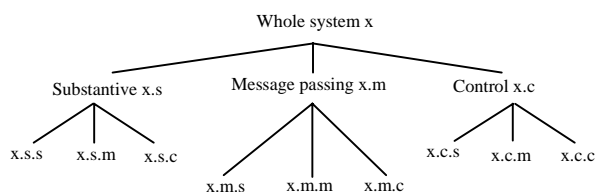
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Fig. 3. Organisational morphology [11]

III. A CASE STUDY: ANALYSIS OF ACADEMIC ACTIVITIES USING ORGANISATIONAL MORPHOLOGY

Academic members are known as the main resource for universities in the world. They play important roles in providing human capital for industries and governments. They also lead in growing the countries' economy through their findings in research activities. More than that, in recent years they are being appointed for performing an increasingly diverse range of roles such as teaching, research, consultation, student development and social service. The roles actually correspond to business processes within the organisation. Many universities however do not provide a comprehensive and well-documented profile that governs particularly to new academic members on what they are supposed to do when entering an academic field. In fact, the existing profiles do not fulfil academic members' requirements as there is unclear separation between essential activities and supporting activities. These profiles also do not provide the details of activities such as when the task should be executed, in what conditions and who responsible to execute those activities. These ambiguous activities will essentially give a huge impact to the overall of organisation's operation. Organisational morphology is thus used to profile academic members' activities as best demonstrated in Fig. 4.
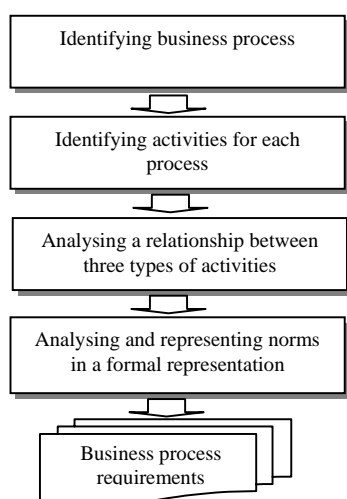
Fig. 5. Phases for profiling business knowledge using organisational morphology

A. Identifying business process

Note that business processes can be harder to capture if it does not exactly involve people who have been performing those business routines. In this case study, based on the experience of authors who directly engage in academic field as an academic member for more than five years, has primarily facilitated in understanding how current activities going on in the field. On the other hand, the identification of business processes has been initiated by studying relevant documents such as manual reports, employee handbooks and distributed memos. In the example of Universiti Teknologi Malaysia (UTM), its main business processes can be clearly identified through its institutional goals (more details see [12]). Currently, UTM has six goals to be achieved hence business processes: teaching and learning, research and innovation, providing professional development programmes, enhancing international standing, contributing to the community through research and service, and providing quality management.

B. Identifying activities for each process

The main purpose of the second stage is to identify activities for each process that has been recognised through the previous stage. This is done by analysing existing relevant reports, handbooks and documentations. At the same time, interview sessions with potential users have been carried out to obtain confirmation and additional information. Note that for this study only one business process has been selected as a pilot which is teaching and learning process. As a result, teaching and learning process usually entails in activities like providing course outlines, marking assignments, teaching courses, setting examination questions, uploading course materials in e-learning etc.

C. Analysing a relationship between three types of activities

The third stage is concerned with analysing a relationship between three types of activities. Generally, in order to perform substantive activities, there must be activities to inform relevant people to apply those substantive activities and to ensure that people obey the activities to which they are subject. These activities actually can be classified as communication and control activities. For instance, the activity *providing course outlines* requires at least an activity to let relevant academic members know about that activity (is shown by the arrow *a*) and at the same time another activity is needed to monitor and evaluate those activities (arrows *b* and *c*). The relationship among substantive, communication and control activities is best illustrated in Fig. 5.
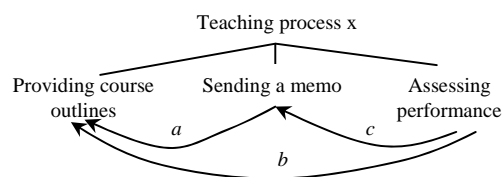
Fig. 5. The relationship among substantive, communication and control activities

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Note that, all activities are directed by norms and thus three types of norms exist; each is associated to a category of activities. In the example of the activity

D. Analysing and representing norms in a formal representation

The fourth stage is concerned with analysing each activity and norms associated with. These norms are then explicitly expressed in a formal representation. Therefore people can easily understand, follow and ultimately automate these norms into computer-based systems. A general form of norms representation is as follow:

whenever *<context>* **if** *<condition>* **then** *<agent>* **is** *<deontic operator>* **to** *<action>*

- *Context* is related to the situation in which the responsible agent exists or roles that the agent plays. It often describes who and what.
- *Condition* corresponded with any circumstances that need to be met in order for relevant actions can be executed.
- *Agent* refers to who will execute the action. Here, an agent can be a person, group, organisation, software or physical artefact.
- *Deontic operator* specifies what kind of action will be executed whether obligated, permitted or prohibited.
- *Action* reflects what act to be performed based on the conditions that have been determined in the trigger analysis phase.

It is important to note that, each activity must at least have two norms known as startNorm and finishNorm. StartNorm reflects to a norm that makes a particular activity to begin. FinishNorm refers to a norm that makes that activity is ended. In order to keep in existence, some activities might need another type of norm called operationalNorm [13]. The examples of these three types of norms are shown in Fig. 6.

```
<?xml version="1.1"?>
<startNorm>
  <whenever_context>a member of academic staff is a coordinator for the particular course</whenever_context>
  <if_condition>the semester is begin</if_condition>
  <then_agent>the coordinator</then_agent>
  <is_deonticOperator>obliged</is_deonticOperator>
  <to_action> prepare a course outline </to_action>
</startNorm>

<operationalNorm>
  <whenever_context> a member of academic staff is a head of department</whenever_context>
  <if_condition> the semester is begin </if_condition>
  <then_agent> the head of department </then_agent>
  <is_deonticOperator> obliged </is_deonticOperator>
  <to_action> approve a course outline </to_action>
</operatonalNorm>

<finishNorm>
  <whenever_context> a member of academic staff is a coordinator for the particular course </whenever_context>
  <if_condition> the semester is begin </if_condition>
  <then_agent> the coordinator </then_agent>
  <is_deonticOperator> obliged </is_deonticOperator>
  <to_action> circulate a course outline </to_action>
</finishNorm>
```

Fig. 6. The norms for *providing course outlines*

As mentioned earlier, the main result of this profiling process is business knowledge documentation. This outcome can also be deduced as a part of business requirements which is used by the organisation to redesign their business process.

For example, the three norms as stated above can be programmed according to specified rules since these norms are repetitive and occur every semester. Thus, academic members can automatically receive information about the activity through their email or department's website.

IV. CONCLUSIONS

In this paper, the critical need for profiling business knowledge knowledge has been highlighted in order to document business process-related knowledge. The representation of knowledge in norms consequently gives a great advantage in providing guidance for individuals and organisations to make judgments, formulate decisions and do their work. Most importantly, all those actions are on a legal basis and acceptable within the community. Moreover, the use of organisational morphology to identify activities and then classify them based on three types of norms: substantive, communication and control norms, essentially assists organisations in devoting their resources to essential activities rather than supporting activities. Ultimately, the business process requirements result from this profiling stage enables organisations to redesign their business process and organisational structure in order to meet the new business requirement and help them to remain relevant and competitive in their environment. The study however still requires further work which includes identifying an appropriate mechanism for creating norm-based workflow in order to facilitate the implementation of activities within a business process efficiently.

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