A New Adaptive Business Model for E-Commerce

Saqib Ali, Ben Soh and Torab Torabi

Department of Computer Science and Computer Engineering
La Trobe University
Bundoora, VIC, 3083, Australia
{saqib.ali, b.soh, t.torabi}@latrobe.edu.au
Fax: (61 3) 9479 3060

Abstract

It is crucial for a company to build their business model in such a way that if it needs to adapt new changes then it has enough flexibility to adapt their system without redesigning the whole business model.

The business model needs to be flexible, adaptive, and integrated. Not only the system processes but also cultural and business strategies have to be coherent. This approach allows a company to handle any change in a much more adaptive way to compete in the market.

In this paper we proposed a step-by-step approach to define a new adaptive business model and based on our model we present a scenario-based implementation as proof of concept.

1. Introduction

In business world, competitiveness is important. Businesses need to focus on the fact that they have to be able to change rapidly, be able to adapt, and be flexible. The adaptive enterprises are able to change rapidly, which is being productive [1].

We know an organisation that keeps experimenting with roles and people in the hope of creating an entity that will be successful in terms of revenues and profits. The organisations keep chopping and changing. There have been times when changes have been announced and not implemented – because the decision was changed before the implementation commenced. The mindset seems to be that of a migrant that came into new country, not knowing in what direction to turn and what to do. Introspection and rational decision-making have been prominent by their absence [2].

The action of changing structure, repeatedly, has resulted in the organisation struggling to cope with the changing dynamics and in maintaining a competitive edge in the marketplace [2].

Models are valuable for understanding complex information, in recent years; a new modelling approach has gained prominence. This new approach emphasis the need for designing business solutions with a focus on flexibility and adaptability. This modelling approach is referred to as adaptive business modelling, which provides the architectural view for business models.

2. Background

2.1 Business model, issues and their adaptiveness

The term Business Model has various meanings. However most agree that a business model represents a way of doing business [3]. The general business model has to address the following issues [6]:

- *Product innovation*
- *Customer relationship*
- *Infrastructure management*
- *Financial aspects*

It is very difficult for every e-business to communicate with each other because of their uniqueness in their business structures, which also affects its efficiency and performance. Business structures must be flexible and build in such a way that if they need they can easily adapt those changes without redesign the whole business model.

Even though the differences among organisations are enormous, there are many similarities that enable them to be classified. One widely used classification is the twofold system (mechanistic versus organic forms of organisational structure) developed by Tom Burns and G. M. Stalker in their study of electronics firms in the United Kingdom [6].

On the other hand, the organic structure is more flexible, more adaptable to a participative form of management, and less concerned with a clearly defined structure. The organic organisation is open to the environment in order to capitalise upon new opportunities [5,6].

According to Gartner research, Daryl talks about alertness in terms of flexibility, awareness of

information, and being able to be productive in business. To remain competitive in a particular market space, an adaptive enterprise is able to quickly [2]: build a culture around change, initiate new thinking and new corporate action to productive consistently and tie in new processes. The focus is to be flexible, adaptive, and integrated as a business. Not only have your processes in technology, but culture and business strategy had to be tied together.

3. Business model restructuring for adaptiveness

Business modelling is a set of activities to help to visualise and understand business processes. In effect, the model becomes an operational description of the business that can illuminate value/cost tradeoffs, priorities, and risks that specify the rules governing the overall operational guideline of the business [4].

We define adaptive business model is "An adaptive architecture of an organisation based on rules, processes and structure which able to react with changes in its environment." [4]. As the dependence on technology has increased in recent decades, the information systems have become a major factor in how quickly an organisation or business can react to changes in its environment.

We developed a step by step approach to define business model.

Step 1: Identification of business components
We have identified three main components of business model, business *structure*, *process* and its *rules* [5]. The business structure defines business objects and the way business presents itself internally or externally. The business process relates to practices and procedures followed by the business (manually or automatically), where-as the business rules [8,9,10] are applied to business processes to define input, output, and operational constraints when business processes are followed.

Each of these three components are further classified and explained in detail [4]. Each of these components has relationship between each other, Business structure is *defined_by* Business Process and Business Process is *according_to* Business Rules, where Business Rules has the *depends_upon* relationship with Business Structure [12], for example business process takes place on some business rules and business processes are created according to some business rules. The business structure means the way, business looks like internally and externally, i.e. employees (CEO, Managers etc) or departments (finance, HR etc). The business process

relates to its working internally or externally as to show how does it actually works (e.g. manually or automatically), where-as the business rules which applies to business processes work according to assign rules. These Rules may be governmental, industrial or company's own rules.

Step 2: Specification of business structure model
We describe an organisation as a hierarchy of entities/actors that perform different activities inside the business/organisation. Entities/actors may be individuals called users or business units (e.g. division, departments etc.) including several actors. A user may play different roles in the business/organisation replacing another user in the fulfilment of an activity.

The hierarchy of the business or organisation is defined in terms of two relationships. First, a membership relationship defines the composition of each organisation unit. It is represented by the aggregations has_users and has_units, as we clearly discussed these relationships in detailed in our research paper [4].

Step 3: Specification of business rules model
Business rules are a functional requirement, the decisions, guidelines and controls that are behind system functionality. There is need for designing applications with a focus on flexibility. This approach, commonly referred to as business rules approach, provides a framework for capturing business rules, clearly separated from system functions [11].

In the following UML diagram we represents a model diagram of business rules, these business rules are a component of a business model, which we already explained in detail in our research paper [4]. Here we only emphasis on business rules model component where business process component is become part our future research.

Business rules are based on policies and documents where these documents consist of procedures and standards that follow internal/external protocols. Business rules are the policies and constraints of the business, whether the "business" is banking, supply chain, software development or automation engineering.

The productivity of business process development can be increased because previously defined rules will be mentioned as existing artefacts. This concept of reusability aims at increasing the productivity and quality in large-scale business processes development. This approach satisfies the needs for rapid change in business application by providing a reconfigurable set of components.
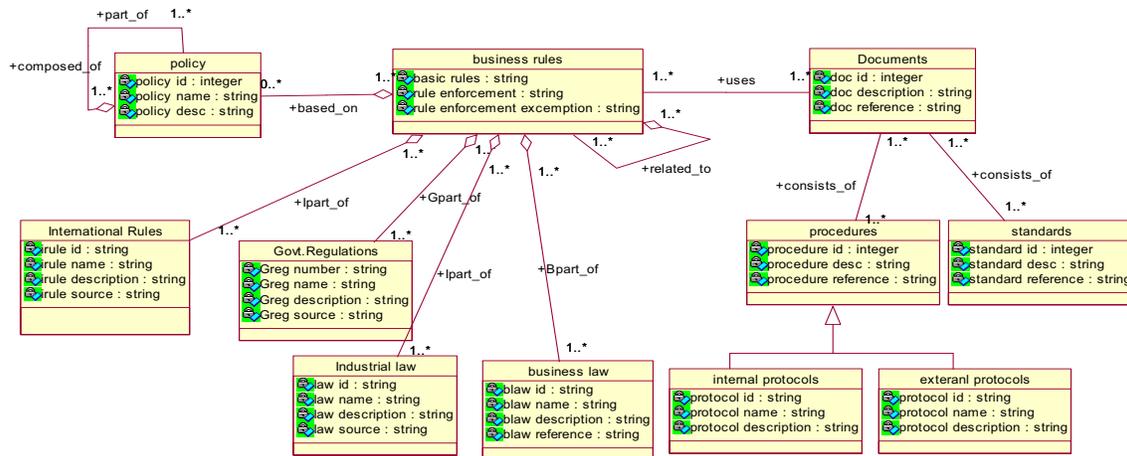
Figure 1: Business Rules Component.

4. Business model adaptiveness

An organisation has to deal with many cultural differences in society, different rules of governance, and different rules for personnel. To strategize effectively, they must decide on issues in a consistent framework. An adaptive business is able to keep that framework fresh, making decisions on any given day, and adapting the corporate strategy to fit the needs of the enterprise [12].

A key issue in accomplishing the goals identified in the planning process is structuring the work of the organisation. The purpose of the organising function is to make the best use of the organisation's resources to achieve organisational goals.

According to our proposed adaptive business model, businesses can overcome with all these issues and problems of adaptability we mentioned earlier by keeping their framework alive, fresh and up to date. We separate whole business process into components, structure, process & rules. Each component can be reused in different organisational structures based on their needs and importance.

5. Example scenarios

We are considering an example of vehicle reservation system, where customers can reserve different kind of vehicles for particular date/time and return them. The reservation system involves many steps, but for the sack of simplicity here we only discuss its involvement of business rules into one simple business process. We discuss the scenario of returning vehicle or return damaged vehicle.

For this particular situation a company will have their rules and policies, which may involve third party rules,

such as involvement of police laws and insurance company's policies. The third party will verify these conditions based on their own rules and policies. The process of returning damaged vehicle is also depends upon other businesses.

The figure 2, we represent the outcome of our proposed scenario for country A, where business rules including their polices and procedures are very important and strict so everyone has to follow them.

This business process is based on adaptive business model and now we take the same business process for country B where culture, behaviour and process are different then country A. In Country A & B, ways of doing things are different, in country B people don't use insurances much because repair cost are much cheaper then insurance costs that's why if someone wants to rent a car then insurance is only applied on brand new cars and there is no insurance at all on old cars infect money deposit applies in both countries. We use same business model components to develop country B's business framework, which shows the adaptability of our business model.

From the above scenario implementation we conclude that if business model is flexible then it can be adaptable and reused into other business no matter what environmental changes took place.

We have adopted the XML schema transformation rules as defined by Feng Liang in [13] and according with w3c specification. In our implementation we only defined xml schema once and map this in other scenario, basically we only have one basic schema used for both cases [7].

Company's Procedure :

Procedure	Procedure Name	Procedure Details
Pro 1	Must have current driving license	Show Details
Pro 2	Must required insurance cover	Show Details
Pro 3	Provide Reference of person or company	Show Details
Pro 4	Must required special permission	Show Details

Procedure Details:

Procedure id	Procedure Name	Procedure Description
02569876	Must have current driving license	Original or certified National and international licenses accepted
02569877	Must required insurense cover	Must Pay Vehicle Insurance for duration of hiring period.
02569878	Provide Reference of person or company	Reference of Person or company required
02569879	Must required special permission	Must provide special permission from guardian

[Process] [Cancel Process]

Figure 2: Rental Reservation System with rules (country A)

In figure 3 we present sample of xml schema we used in our scenario implementation.

```
<xs:complexType name="PolicyType">  <xs:sequence>
<xs:element name="policy_id" type="xs:integer"
minOccurs="0"/>
<xs:element name="policy_name" type="xs:string"
minOccurs="0"/>
<xs:element name="policy_desc" type="xs:string"
minOccurs="0"/>
</xs:sequence>

</xs:complexType>
<xs:complexType name="DocumentsType"><xs:sequence>
<xs:element name="doc_id" type="xs:integer"  minOccurs="0"/>
<xs:element name="doc_desc" type="xs:string"  minOccurs="0"/>
<xs:element name="doc_reference" type="xs:string"
minOccurs="0"/>
<xs:element name="procedures"  type="proceduresType"
minOccurs="0"  maxOccurs="unbounded"/>
<xs:element name="standards" type="standardsType"
minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
</xs:complexType>
```

Figure 3: XML Schema

6. Conclusion & future work

Most appropriate organisation structure for each situation depends upon technology, organisational size, goals and strategy, environmental stability, and characteristics of the employees. We introduce a new adaptive business model, which helps organisations to design and implement their structures. Each organisation needs to evolve and customise a structure that suits its business objectives and culture. This can be done by asking relevant questions and addressing key aspects. To fulfil most of above mentioned issues we are able to define adaptive business model.

In this paper we able to demonstrate the ability of our proposed business model as an adaptive, customisable and flexible. In future we are doing our research in adaptive business processes based on our adaptive business model. We believe if businesses have adaptive structure model then processes can also be adaptive across the organisation.

Reference:
[1] N.R. Jennings, T.J.Norman, P.Faratin, P.O.Brien and B.Odgers, "Autonomous Agents for Business Process Management", Int. Journal of Applied Artificial Intelligence 14(2) pp.145 – 189, 2000.

[2] Daryl Plummer, "Business Breaktthroughs", in Strategies for the adaptive enterprise by Agnetis, Volume Spring, 2004.

[3] A.T.Silvia and F.Xavier, "Software Process Modelling", in proceedings on the software process in software engineering and knowledge engineering, Argentina, 2001.

[4] T.Torabi, S.Ali and W.Rahayu " A Specification for Business Model Components for B2B Communication", in proceedings on IASTED Software Engineering Application Conference, Marina del Rey, CA, USA, 2003.

[5] M. Dubosson-Torbay, A. Lausanne, Y. Pigneur, eBusiness Model, Design, classification and Measurement, Proc. Thunderbird International Business Review, 2001.

[6] Burns, Tom and G. M. Stalker, Management of Innovation, London: Tavistock Publications, p. 19, 1961)

[7] T.Torabi, T.S.Dillon and W.Rahayu, "XML Schema for Software Process Framework", in 21st IASTED International Multi-conference on Applied Information, Innsbruck, Austria, 2003.

[8] J.C.Leite and M.C.Leonardi, "Business Rules as Organizational Policies", in IEEE Ninth International workshop on Software Specification and Design, p. 68 - 76, Ise-Shima Japan, 1998.

[9] Jamie Friedman, "The RulesPower Business Process Management Systems", in RulesPower White paper, pp. 1- 9, 2003.

[10] M. Dubosson-Torbay, A. Lausanne, Y. Pigneur, eBusiness Model, Design, classification and Measurement, Proc. Thunderbird International Business Review, 2001

[11] Ellen Gottesdiener, "Capturing Business Rules", Software Development Magazine: Management Forum, Vol. 7, No. 12, December 1999.

[12] Jun-Jang Teng, Schiefer , J.; Chang, H., An Agent-based Architecture for Analysing Business Process of Real –Time Enterprises, Enterprise Distributed object computing conference, Proceedings. Seventh IEEE International, 16 -19 Sept. 2003. p. 86 – 97, 2003.

[13] R. Xiao, T.S. Dhillon, E.Chang, L. Feng, Mapping Object Relationships into XML Schema, Proc. ACM Transactions on Information Systems, Vol. 20, 2002, 1 - 12