Business and Information Technology Re-alignment through Managing Business Process[1]

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Abstract: It is often the case that organizations must quickly adjust their goals/objectives due to rapid changes in the business environment, particularly in relation to changes in customer services, technologies and product lifecycles. This rapid evaluation of goals affects the already aligned environment between business and IT, therefore re-alignment is important. This proposed realignment framework consists of five levels in order to redesign the business process in context with Business-IT alignment: 1) identification of business process goals and objectives in the form of "company vision"; 2) identification of the IT resource capability in terms of "where is IT department now?"; 3) illumination of business goal changes in the form of "what business wants to change?"; 4) formulation of strategy to manage changes in terms of "how to implement the change?"; 5) finally, the specification of process redesign in the form of "did IT get there?". This momentum keeps going until the change is finalized. Business process realignment is possible by rethinking and redesign of business goals and objectives that achieved dramatic improvement in the organizational performance, product quality, speed in organizational services and improvement in information system support.

Key words: Business-IT re-alignment, IS services, business process, IS support, case study.

1. Introduction

Alignment between business and IT refers to the optimized synchronization between dynamic business objectives/processes and respective technological support by IT [1], [2]-[26]. Attaining alignment between business and IT has been a crucial challenge for many business organizations, and business and IT researchers have seriously considered and worked on this challenge from the early 1970s [2]-[4], [7]-[10]. Moreover, alignment is the process where both fields of business and IT are interrelated, with IT providing services at all levels of the business organization to enable it to effectively achieve its goals and objectives. To heighten alignment in any business organization, strong strategic [6], [14]-[16], structural [5], [17]-[19], social [7], [20]-[22] and cultural [2], [3], [23], [24] relationships between business and IT are required [19-27]. However, bridging the gap between business and IT has been regarded as difficult due to rapid changes in the business environment which force organizations to innovate their business strategies, business processes as well their supporting information systems continuously. This rapid innovation from the business side affects the already aligned environment between business and IT [8]-[14].

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Re-alignment refers to the method of managing the rethinking and redesign of business goals and objectives to achieve a dramatic improvement in the organizational performance, product quality, cost, speed in organizational services and improvement in IS support. In another words, it involves adding new features or functionalities or implementing a completely new business goal based on an original goal specification technique using forward alignment between business and IT. The concept of realignment arises from a variety of business needs: first, managing rapid changes from the business environment [27]-[32]; second, the need to change the existing information system to provide better support to the organization which is referred to as system reengineering [30]-[35]; and third, business process redesign, for example, the need to fix defects in the running processes [33]-[35].

The aim of this paper is to present a framework on re-alignment between business and IT by considering the business process. The framework extends our already accepted Business-IT alignment technique [11]. The main contribution of this paper is to support IT analysts in order to redesign the business process in a frequently changing business environment so that an unaligned organizational environment between business and IT can be re-aligned.

The paper is structured as follows: in section 2, we review the concepts presented in our paper which includes theoretical concepts of alignment and re-alignment. Section 3 presents the proposed re-alignment framework which is further divided into: the identification of the business process vision and IT responsibilities, what the business wants to change in the running process (the problems) and how to implement the changes. Finally, section 4 presents the conclusion, implications and future research direction of the paper.

2. Theoretical Concept of Alignment verses Re-alignment

The concept of Business-IT alignment is often applied to achieve discrete organizational goals at a specific moment in time. This discrete one-off viewpoint forms the illusion that, if properly organized, an alignment initiative will lead to the fulfilment of organisational goals that is, of having information systems/ IT completely aligned with the business organization's needs. However, in this rapidly changing business environment and due the increasing demands of new technology, the process of alignment is inevitably continuous. Many organizations these days often fall into a situation of painfully rescuing the development of their major (large) goals or persistently cancelling goals and starting new ones. In this scenario, the need to continually align (or realign) IT to the changing business is perceived as a hazard to organizational performance and competitive benefit; constant change is not efficiently capitalized over time, and opportunities are not discovered [5]-[7], [8]-[15].

We found in our previously accepted Requirements Engineering-based Business-IT alignment approach that the process of alignment needs to be continually realigned so that frequent changes from the business side can be managed [11]. Realignment refers to the method of managing the rethinking and redesign of business goals and objectives to achieve dramatic improvement in the organizational performance, product quality, speed in organizational services and improvement in IS support. Our proposed realignment framework consists of five levels in order to redesign the business process in context with Business-IT alignment: 1) identification of business process goals and objectives in the form of "company vision"; 2) identification of the IT resource capability in terms of "where is IT department now?"; 3) illumination of business goal changes in the form of "what business wants to change?"; 4) formulation of strategy to manage changes in terms of "how to implement the change?"; 5) finally, the specification of process redesign in the form of "did IT get there?". This momentum keeps going until the change is finalized.

3. The Re-alignment Framework

An effective and efficient relationship between business and information technology is a critical factor for the success of today's business organization. Alignment between business and IT refers to the optimized synchronization between dynamic business objectives and respective technological support by IT through the development of information systems that meets the business needs. The goals of alignment include ensuring that IT goals/objectives are aligned with the business goals/objectives, strong working relationships between business and IT exist, and the delivery of effective and efficient IT services to the business. However, it has long been well known that sustaining Business/IT alignment is difficult due to rapid changes in the business environment, particularly in relation to changes in consumer services, technologies and product lifecycles. To succeed in this rapidly changing and competitive market, organizations need to be able to change their goals and objectives rapidly, which can be difficult for IT to understand.

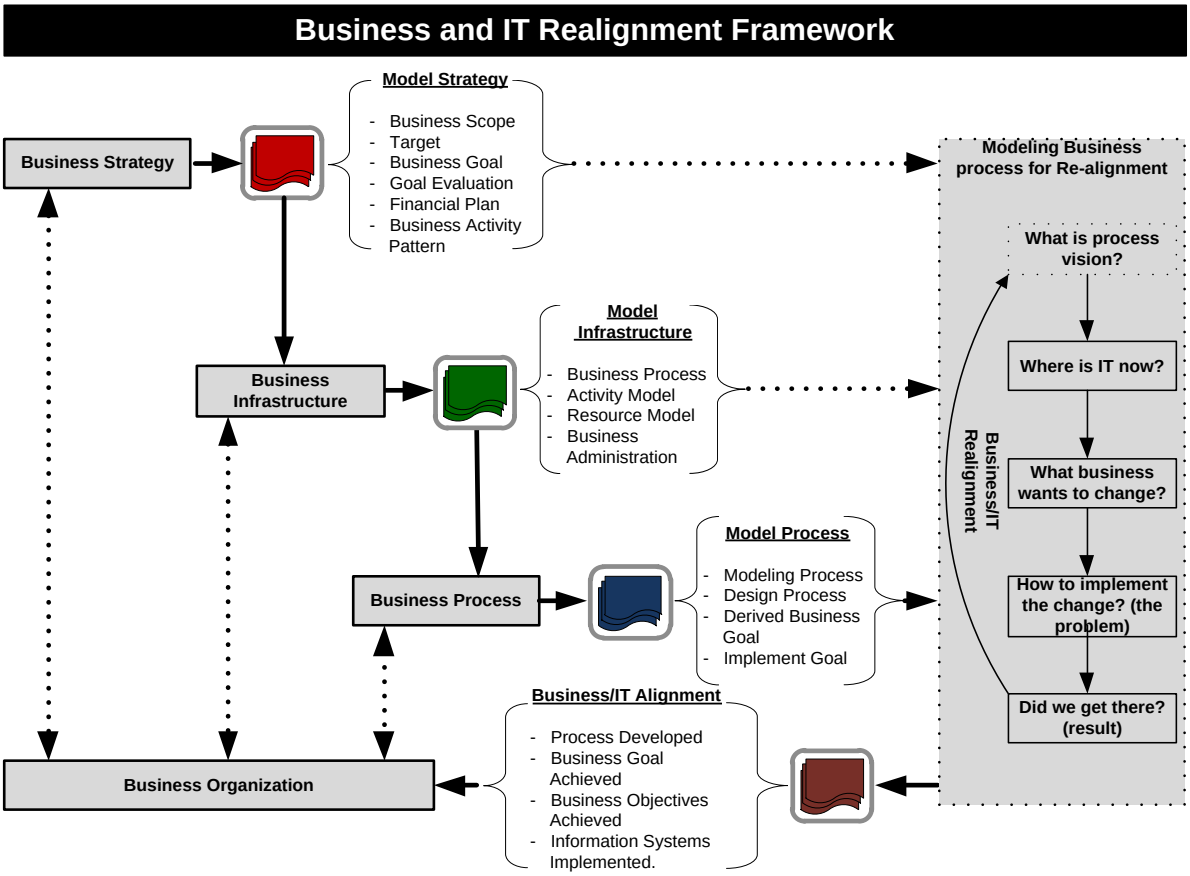

Fig 1. Proposed Re-alignment framework [10].

The aim of this framework is to re-align business processes so that information systems developers can better understand the rapid changes in running the business environment, particularly changes in business processes. It is well known that the business process is a key element of the business where all other elements (business strategies, business goals, business policies, business objectives etc) are based and that this is the reason why successful business organizations need to continual evaluate and update their processes [11]. The planned framework is structured in two parts as shown in Fig. 1. Part 1 consists of modelling business strategy, modelling business infrastructure and modelling business processes that describe how to align business with IT through considering business processes in the context of system requirements engineering. The Business/IT alignment part is based on our previously published work [10].

Part 2 of the framework describes how to develop realignment between business and IT environments,

after organizations have rapidly changed their business processes. Part 2 is further divided into five levels: level 1 (what is the process vision?) details the business process vision which refers to the aims, goals and objectives of the business; level 2 (where is IT now?) describes the current capability of IT to support the business and their available resources; level 3 (what business wants to change?) outlines the changes that business requires in the running of the business process and prioritises them; level 4 (how to implement the change?) depicts the detail planned for IT services and how IT can manage the business changes; level 5 (did IT department get there?) describes the completion of business process changes Part 2 momentum keeps going until the change is finalized. Part 1 of the framework has been answered in our requirements engineering based Business/IT alignment approach [10]. Part 2 is the main contribution of this paper.

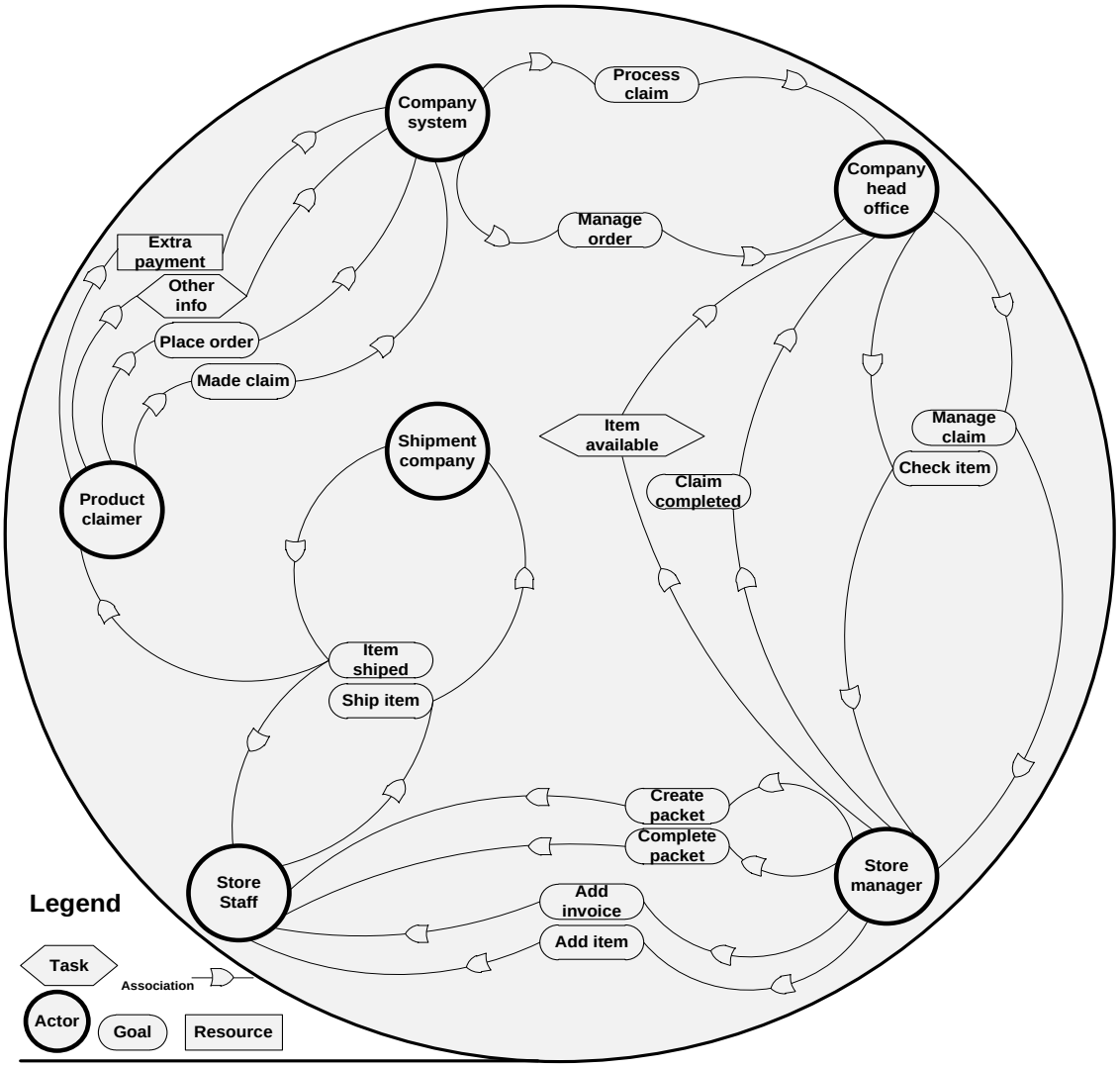

Fig. 2. Process of order management in an automobile company- case study.

3.1. Process Vision and IT Responsibilities

After the development of the Business-IT alignment methodology in our previous work [10], we found that organizations change their business processes rapidly which alternately affects the alignment process. Therefore, realignment between business and IT is important. The term realignment refers to the method of managing the rethinking and redesign of business goals and objectives to achieve dramatic improvement in the organizational performance, product quality, speed in organizational services and improvement in IS

support. For the development of realignment, it is important to identify the organizational vision and how IS supports that vision, for instance, what are the primary organizational goals or business unit which companies change rapidly? To validate this proposed realignment framework, we extend our already published case study on the process of order management in an automobile company [11].

To discover and analyze the organizational process including goals and objectives, we used the i* approach [12], [13], as shown in figure 2. The approach was developed for modeling and reasoning the business process and the environment of the related information technology departments. The approach is categorized into two major modeling components: 1) the strategic dependency model which is used to define the dependency associations between the business organizational actors or activities; 2) the strategic rationale model which is used to depict the business interests in the proposed process, for example what business needs, what are business' main concerns, and how might these concerns be addressed in the context of organization and information technology environments. Literature shows that the i* approach is widely accepted in the fields of business process modeling, redesigning, process reengineering and information technology environment modelling [12].

The main goal of the automobile company in this proposed business process is to supply auto parts within the country, where several activities such as: product claimer, company system, company head office, store manager, store staff, and shipment company participate. The nodes in figure 2 represent the activities and the link between two activities indicates that activity 1 depends on activity 2 for some functionality that will allow activity 1 to achieve some company goal. In this case, activity 1 is known as a receiver and activity 2 is known as a sender. The sender activity is valuable to the receiver activity; if the sender fails to deliver the requested functionalities, the receiver would be adversely affected in its capability to achieve company goals. There are three types of dependencies used in the case study: 1) the business goal dependency: the actors in the case study depend on each other to bring about a certain state in the reality. The sender actor gives the receiver actor a choice as to how to accomplish its state.

The company system actor in figure 2, for example, wants the claim to be processed it does not tell the company head office actor how actually to manage it. The business goal dependency can be further divided into fourteen sub-dependencies, as shown in figure 2: place order (allows customer to place the order), manage claim (supports customers to lodge an item claim with the company), process claim (defines the claim to be forwarded for completion), manage order (responsible for forwarding the customer order to the company head office for completion), manage claim (requests the store manage to look after the claim), check item (the store manager checks the item availability), claim completed (claim completion feedback is sent to the company head office), the goals create packet, complete packet, add invoice, add item (responsible for completing the customer order), finally the goals, ship item, item shipped (responsible for delivering the item to the customer). 2) the business task dependency: the actors depend on each other in order to perform process activities.

This can be used when actors perform any activity. In figure 2, for example product claimer must follow the company policies when making a claim, and store manager must inform company head office when the stock is gone. 3) the business resource dependency: the actors depend on each other for the availability of some entity. The organizational resource can be informational or physical. In figure 2, for example, the product claimer expects the company system to charge extra money.

3.2. What Business Wants to Change (the Problem?)

In the field of managing business processes and information technology that supports processes, there is a need to understand the entrenched assumptions between them. However, it is often the case that many organizations ignore these assumptions during the process modelling phase due to the use of traditional modelling methodologies. Therefore, without this deeper level of understanding, organizations will find it

difficult to manage frequent changes in processes, which alternately adversely affects the method of Business/IT alignment. Our method of reengineering process based on the following mathematical model. According to the literature of information systems the business process can be define as:

$$P =< \{E\} T \{R\} T \{C\} >, \{E\} \subseteq U, \{L\} \subseteq U \quad (1)$$

where

{P} = Business process which need to be redesign

{E} = Set of primary elements of proposed business process

{R} = Set of relations, determinate on elements of set in business process {E}

C} = Set of conditions limiting relations in business process{R} on set {E}

{U} = Universe from which the primary elements of set in business process {E} are selected

{N} = Set of replacement that determine the rules of selection of primary elements of set in business process {E}

{T} = Totality of composition laws that determine the rules of synthesis out of sets in business process {E}, {R} and {C} are elements of P

Once the business process has been selected, the conditions for business process during reengineering can be described as follows: Suppose that during business process utilization some faults caused by lapses in performance of business processes were found. To remove these faults, we need to change the business process design *LGu* its model in a general case correspond with the model (1) and looks as follows:

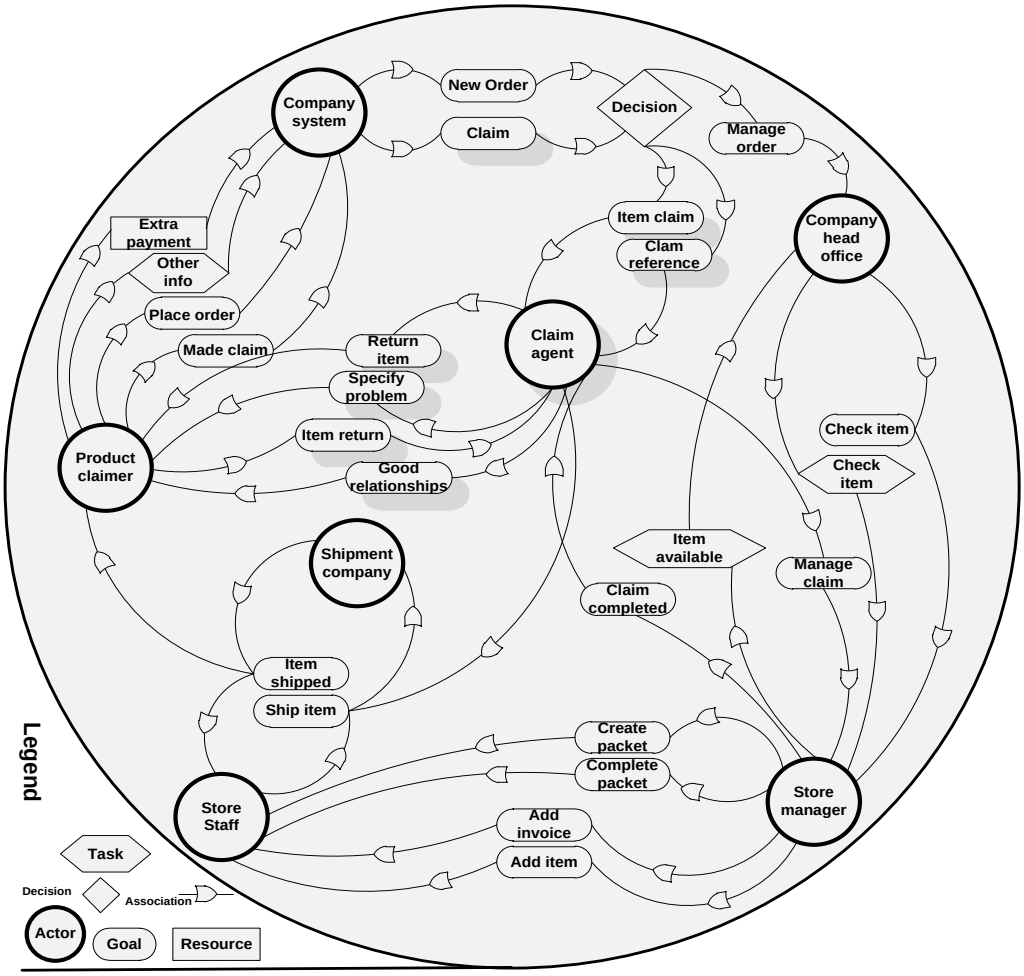

Fig. 3. Process realignment proposal 1.

$$P_{LGu} =< \{E_{LGu}\}T\{R_{LGu}\}T\{C_{LGu}\} >, \{E_{LGu}\} \subseteq U_{LGu}, \{N_{LGu}\} \subseteq U_{LGu} \quad (2)$$

where

$\{P_{LGu}\}$ = A model element L_{Gu} which analysed business process

$\{E_{LGu}\}$ = Set of functions that ensure proposed business process redesign

$\{R_{LGu}\}$ = Set of relations, determinate on elements of set that need to be automate in business process $\{E_{LGu}\}$

$\{C_{LGu}\}$ = Set of conditions that limit relations in order to fulfil redesigning of business process and client's requirements

$\{U_{LGu}\}$ = Universe of controlling functions, determined by the actual methods of an enterprise's management

$\{N_{LGu}\}$ = Set of the client's requirements means change from business administration in business process determining the rules of selection of automated functions for process $\{E_{LGu}\}$ universe U_{LGu}

Whatever modifications and redesigning should be made in the proposed business process, the model of functional structure *LGu* after the reengineering processes will be as follows:

$$P'_{LGu} =< \{E'_{LGu}\}T\{R'_{LGu}\}T\{C'_{LGu}\} >, \{E'_{LGu}\} \subseteq U_{LGu}, \{N'_{LGu}\} \subseteq U_{LGu} \quad (3)$$

where

$\{P'_{LGu}\}$ = A model element L_{Gu} business process reengineering and redesign

$\{E'_{LGu}\}$ = Set of primary elements L_{Gu} of proposed business process after redesign

$\{R'_{LGu}\}$ = Set of relations, determinate on elements of set that need to be automate in business process $\{E'_{LGu}\}$ after redesign

$\{C'_{LGu}\}$ = Set of conditions that limit relations set in business process $\{R'_{LGu}\}$ after redesign

$\{N'_{LGu}\}$ = Set of the client's requirements means change from business administration in business process determining the rules of selection of automated functions for process $\{E_{LGu}\}$ out of universe U_{LGu} after redesign

Our focus in this case study is to attempt to re-engineer or redesign the whole process in order to support the product claim processing method in the context of Business/IT alignment. In analysing the process problem, the analysts might ask: why does the current process take so much time to execute item claim?; why does the organization hire a claim agent to manage the claim?; and is there any other way to manage the claim? The process redesign engineers are concerned with the organization, its representatives, and its consumers. The automobile organization wants to minimize the administration cost, effort and the speed of process. At the same time, the organization wants the item claimer (consumer) to be happy so that they continue buying the company's products. The item claimer (consumer), on the other hand, wants the claim assessment to be fair and likely to get the new item or money back quickly. The information that the claim representative (claim agent) collects must reflect the interest of the automobile company, consumers and the interest of other company representatives.

3.3. How to Implement the Change and Result

Redesigning and partial modeling in the field of business process modeling/management are the concepts which allow business and IT analysts to maintain the long term alignment process between business and IT. In this section, we show two different ways to realign the process of order management in an automobile company.

3.3.1. Process realignment proposal 1

Fig. 2 shows several dependencies. The product claimer, for example, depends on the company's system to reimburse him for a changed or repaired item (made claim). The system depends on the company's head

office to execute the claim (manage claim), and head office wants the company's service to be fast. To manage the item claim and to check the item availability (manage order), head office depends on the store manager. The store manager depends on the store staff to complete the packet (create packet, complete packet, add invoice, add item). Finally, the store staff depend on the shipped the item (shipped item). This type of business process analysis discovers the important points of the claim management process that traditional ways of managing business processes miss. This is why the management of customer claims is generally slow.

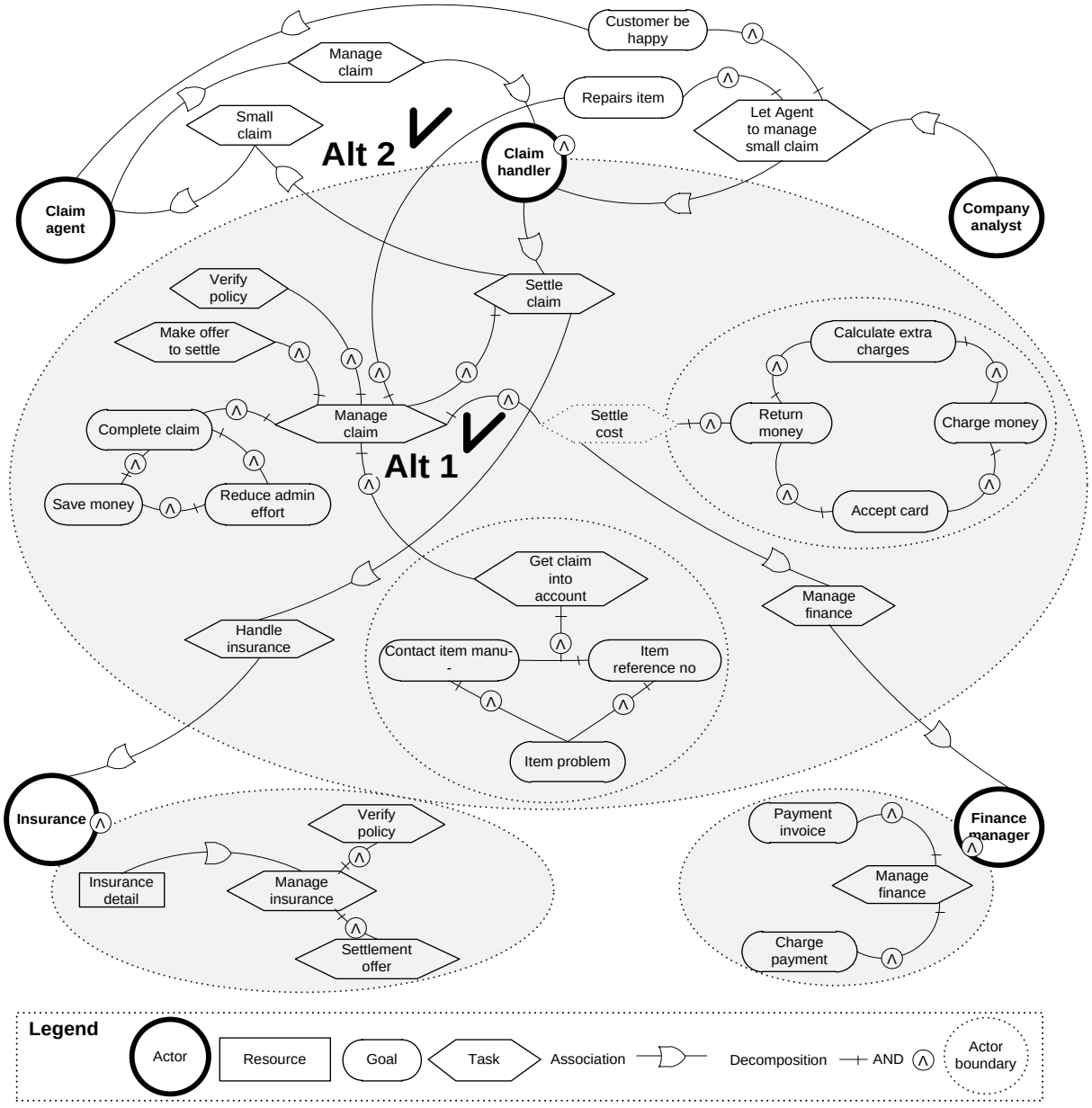

Fig. 4. Process realignment proposal 2.

The analysis of high level business goals could improve the redesign process; therefore, the engineer must consider and rethink high level business goals before the process is redesigned. The engineering team could discover high level goals by asking "why" questions. Once the high level goals are identified, the engineer can then explore the alternatives by asking "how else" the company completes those goals. These two questions help engineers identify the changes in the actor's dependencies so that the process can be

redesigned. Figure 3 shows the changes in dependencies after we redesign the business process. As the process was taking a huge amount of time to process the claim and required a huge amount of organizational effort to complete, one way to reduce the company's administration effort and costs and to make the process faster is to reduce the number of organizational actors involved in the claim process.

Our first realignment proposal in Fig. 3 was "why not let the claim agent manages the claim?" The remaining actors such as company head office, store manager and store staff work on how to manage the new customer order and other enquiries. Shifting the claim handling responsibilities from the store manager to the claim agent means the agent information must also be changed. For example, the company's head office is not really involved in managing small claims. Using the new dependency model shown in figure 3, the process redesign engineers can easily manage the item claim by considering three actors: company system, claim agent, and the shipment company. This proposal explores all possible ways to complete the customer claim which leads the process manager to select the quickest way to manage the customer claim and satisfy the customer.

3.3.2. Process realignment proposal 2

The proposal in figure 3 only provides a hint about how the process can be structured in new ways to provide faster feedback in relation to customer enquiries. However, the proposal at this stage does not provide support for the method of exploring, suggesting and evaluating the alternative business process redesign solutions. This is the role of our second proposal, where we show all process redesign alternatives. Again, the proposal in figure 4 has five graph nodes types: the actor, resource, goal, task and actor boundary. But the proposal at this stage also describes relationships between actors.

Table 1. Example of Partial Process Modeling

How the Automatic process modeling approach tackles the customer claim
1. **Start**
2. Define:
3. **Pre-condition:** Methods that declare the actions and procedures before the business process is realigned;
4. **Post-condition:** Methods that declare the actions and procedures after the business process is aligned;
5. **Pre-condition** manage-claim-file(claim): Claim-made(item claim) & manage-claim-file opened(claim)
6. **Foundations** manage-claim(claim): % get (claim agent, item claimer(claim)) % get remaining foundations and procedures
7. **Claim procedure** verify complex claims (claim) Manage-claim-file(claim) % get item availability & insurance information
8. **Select** complex claim CC [manage-claim (CC)?; request (CC, manage-claim(claim))] ||
9. **If** (claim == required insurance-information) **then** % handle item insurance
10. **Select** manage insurance MI (MI, handle item insurance (MI))? request (MI, handle item insurance (claim))]); Manage-item-claim report(claim); Verify company policy (MI); Settlement offer ();
11. **End if;**
12. **End procedure;**

The literature shows that business process is a key element of the business, where the success of others business elements (such as strategy, goals, objectives, policies) are based [11]. Therefore, it is a collection of several activities with entity flows between them. The claim handling process shown in figure 4 includes business activities such as verify company policies, handle insurance if involved in item, settle cost if any extra charges required and make an offer to settle claim. In this proposal, we manage these activities in two ways: decomposition and means ends, where decomposition is used to identify the process including activities or entities and the relationships between them, and means ends is used to represent relationships between an end and a means for achieving it. Figure 2 and figure 3 describe two different ways to achieve the same business process goal.

Alternative 1 in Fig. 4 represents the redesign proposal in Fig. 2 and alternative 2 represents the redesign proposal in Fig. 3, but with detailed description on how to manage the customer claim. Each redesign proposal contributes to the business process goals in different ways, such as keeping customer happy, reducing administration cost, completing claim in less time etc. By using this means ends, the proposal in Fig. 4 provides a systematic way to identify all possible designs for the process of order management in an automobile company. Task decomposition is used to represent the business process sub-tasks and sub-resources. For example, the managing claim task consists of two further sub-tasks: verify policy, and make offer to settle. Managing the item insurance consists of sub-tasks: verify policy and settlement offer.

3.3.2.1. Partial process modeling

The i* approach is widely accepted in the modeling and business environment such as strategy, processes, goals, objectives etc, but for validation and verification of business process modeling engineers may want to analyze the business process to monitor its behavior under different conditions. In most cases, process management models cannot deal with the partial description of the process. These types of models describe the process only in terms of operations that generate a new design or give a complete specification of the process. However, we found that processes have uncertainties and this is the reason businesses change processes rapidly, which adversely affects alignment [11]. Therefore, partial modeling is important in this rapidly changing process environment. To address this problem, we adopt our already published logical tool known as the “modeling business process automatically using requirements engineering” [10]. The tool addresses incompleteness in the business process automatically. Table 1 gives an example of how the tool will work in order to specify the management of customer claims and it shows how the tool declares pre and post conditions of the claim process. It is suitable to automatically construct a declarative modeling language for the organizational business processes. This not only includes the sequence between the process activities, conditional process activities (if-else-then) and iterative process activities (do-while), but it also identifies the concurrent process belonging to activities. Note that table 1 is just an example of how the claim can be managed in more logical concepts. It is not a complete logical modeling for the proposed automobile case study.

4. Conclusion, Implications and Future Research Directions

Managing rapid changes from the business side is a hard task for the IT department, and it affects the development of information systems in the context of aligning business with IT. The term realignment refers to the management of the redesign and rethinking of currently aligned business processes. This is the scenario when business changes its goals frequently and demands quick support for the change from IT. Our focus in this paper is to tackle the issue of realignment in already aligned business processes. We have extended our already accepted case study on the process of order management in an automobile company in regard to the validation of this anticipated framework [11].

Two major implications can be derived from the study for information systems analysts and business

organizations: for system analysts, alignment is not a single entity that results from the simple press of a button. It is an ongoing process which needs to be continually measured, updated and realigned. This paper presents a realignment framework which allows system analysts to redesign the business process and helps them to better support the organization in order to achieve their business goals and objectives in a rapidly changing environment. For researchers interested in the realignment research area, most of the existing techniques describe how to align business with IT and do not provide information on realignment between business and IT. This paper presents a Business-IT realignment framework and draws the researcher's attention from alignment to realignment.

The framework has one limitation. It is limited by the validation of only one business process in the automobile industry, so there is a need to validate it with different business sectors, as businesses and their processes vary from business goal to goal and from sector to sector. Thus, further research is essential in both evaluating the framework with one or more industry processes in order to improve the sustainability of the framework.

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