

# ORGANISATIONAL DIMENSION OF BUSINESS PROCESS DESIGN IN THE DIGITAL SOCIETY

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## Abstract

*The work presented advocates a pluralistic approach for integrating the concepts of organisational design discipline into the business process design. The paper examines the philosophical foundations of this approach. The proposed integrated approach can be studied at the strategic, the business process and the operational levels. The assumptions made refer mainly to the business process level. The concepts developed can be utilised in the production of organisational design formalisms as part of a larger encompassing business modelling framework.*

*Keywords: organisational design, socio-technical, business process.*

## 1 INTRODUCTION

Within current business environments, organisations are more dependent on their information systems. The business management and information systems literature seems to have various deterministic relationships depending on the requirements of the organisational structures and supporting technologies. Some claims are made that IT affects organisational structures by either centralising them or decentralising them. This mutual association demonstrates that there is a strong relationship between the organisation and IT. The strength of this relationship depends largely on the specific organisational context. Based on this interpretation it is difficult to establish deterministic relationships. It would be more beneficial to examine how IT impacts on an organisation in an *anterior* rather than *posterior* manner. The issue here is not if there is a relationship but rather how to establish it. The relationship between IT and the organisational structures should be examined from a design point of view rather than from an emergent perspective [Loucopoulos et al 1997]. Designing business information systems is no different to other design principles, where design is placed in a wider context. Designing business information systems is not different from what is being done in design, where design is placed in a wider context. According to [Jones 1992] design “applies not only to the work of engineering, architects and other design professionals, but also to the activities of economic planners, legislators, managers, publicist, applied researchers, protesters, politician and pressure groups who in the business of getting products, markets, urban areas, public services, opinions, laws and the like, to change in form and content”.

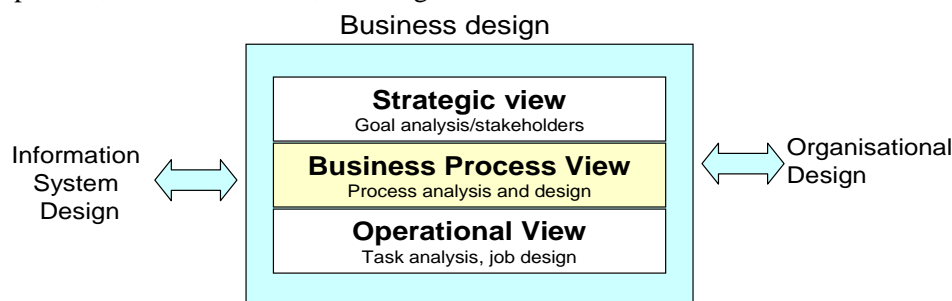


Figure 1. Graphic representation of Business Modelling framework

Depending on the application domain a multi-level framework that allows different forms of organisational transformation is needed. For example Meel proposed a three level modelling

framework linking the organisational design with information systems design [Meel 1993]. Based on this framework Figure 1 suggests that the business design can be captured by three levels or views, namely the Strategic View, the Business Process view and the Operational View.

The *Strategic View* of the enterprise will refer to its high-level organisational objectives, such as global markets, competition, etc. This concept is associated with goals and stakeholders analysis, and usually relates to a higher managerial infrastructure of the enterprise. The strategic aims of the organisation are closely linked with its business processes, expressed in the *Business Process View*. The redesign of the business process is a successful implementation of the strategic choices that the organisation make. The low level task analysis of the business process is referred to in the *Operational View* and is important for evaluation and consideration of the enterprise processes when details are needed.

In this paper the author will attempt to examine the philosophical foundation needed to integrate organisational and information systems design concepts at the *Business Process View* level. The business-modelling environment should examine organisations from a multiple perspective, however the *process aspect* will still form the solid fundament of many methodologies as acknowledged by [Hammer & Champy 1993], [Davenport 1993], [Knorr 1991], [Meel 1993].

Therefore, by examining the needs of such a framework, it will be possible to produce a design modelling framework, which supports integration of people, technology and processes.

The above raises new questions requiring further investigation. From the business analysis perspective the analysts are adjusted to view the computer-based information technology as the enabling technology for the business process design, while the link between the organisation and IT still remains vague. The existing literature is still lacking in describing how to analyse the organisational and human factors from a perspective of enterprise processes. The work presented here attempts to fill this gap. It should provide concepts for organisational modelling which assists in the analysis of human and organisational issues. The effect of IT on the organisation should be viewed from a different perspective. Computers are not viewed as machines that automate tasks, but rather on how they influence people, e.g. enhance skills, empower people. Integration of technologies such as IT, telecommunications and the internet brings new ways of organising and controlling work among people. The social dimension or the so-called 'human factor', which raises issues of peoples goals, values and cultures, should be considered in the business process design.

## 2 THE ORGANISATIONAL DIMENSION OF BUSINESS MODELLING

The majority of the business process design projects consider or imply some sort of '*organisation change*'. Apart from restructuring changes other themes come into picture. In a modern working environment enterprises may find their work being distributed at various locations. Issues such as enterprise organisation, co-ordination and control come into play. This 'wired' pattern of work is now seen in many enterprises. Generally, an analyst is trained in the so called 'hard' approaches and concentrates on designing (or reengineering) aspects of the business process, which do not devote much importance to issues of organisational behaviour and the implications of the new changes. In such cases the analyst has to rely on his skills and intuition. In the approach advocated here, the thinking on organisational matters was based on a number of observations and statements which are summarised as follows:

- Organisational design concepts

The approach presented has benefited considerably from literature on organisational design theory in particular socio-technical design methods as in [Buchanan & Huczynski 1985], [Handy 1985], [Katzenbach & Smith 1993], [Wilson 1992], [Wilson & Rosenfeld 1990], [Mumford 1995]. The organisational paradigms provide useful foundations and concepts for describing organisational

structure, behaviour and collaborative work. Although, the majority of these methods can be viewed as a way of thinking and modelling rather than a way of working or controlling.

- Human work vs. automation work

The newly redesigned business processes suggest a new pattern of work that can be partially or totally automated. Depending on the technological facilities of the organisation a partial or total automation of work can be considered. The better the definition of routine work patterns, the better the chances that they are good candidates for automation. However, due to many other factors automation of routine work is infeasible. While some work can be defined as routine, other can be described as ad-hoc if not chaotic in nature and hence difficult to define a relevant process.

- Team-oriented work

In today's environment individuals work in groups or teams. In environments where the personal computer supports the work of individuals, the question is how to effectively distribute and coordinate work. These issues are examined by the concepts of CSCW or virtual organisations. However, from the business analysis perspective a collective work is viewed from the viewpoint of aggregating work of individuals rather than machines.

- Managing, structuring and controlling working environment

The key to successful organisational design is the effective control and management of the work in the accomplishment of business objectives, mainly minimising costs and the rational use of resources. It is important to establish the right elements and points of control. Control of work has to be placed in the hands of the right people located in the right places and has to be reflected in the enterprise's structure. Issues such as centralised and localised decision making also come into play. Lack of sufficient control measures will have negative impact on the business as a whole.

- IT as enabling factor

Business-oriented technology has always been at the forefront of adopting the information technology as the enabling factor in its design activities. The majority of business design approaches have not satisfactorily addressed the link between the organisation and IT. Issues of human resources and social policies impact on the design process provide a base for further observations on this important subject. Designers and practitioners are now addressing these issues as seen in [Russell et al 2005].

- Goals, culture, beliefs

This represents a social dimension of the business process analysis. Whilst many organisational perspectives can be formally represented by the analyst, this dimension still remains relatively unexplored and with hardly any formal methods of representation. While the analysts always note these issues, they remain out of reach of the majority of modelling methods. Interactions between people (e.g. employee vs. employer) still remain outside any formal definitions, although some literature has emerged in the last few years attempting to address these concerns. Issues of authority, ownership, motivations, social standing, etc. are relevant. With regard to business process design, the degree of human involvement is raised according to the complexity of the business processes. Major differences can emerge between the abstract representation of work and the reality of the working environment.

### 3 ORGANISATIONAL MODELLING AND WORK DESIGN

The objectives of business modelling with respect to organisational models are as follows:

- *Current situation:* to establish all possible existing forms of the organisational structure and organisational dynamics

- *Constraints*: to determine factors that might affect alternative design options with respect to the new organisational structures and behaviour
- *Future situation*: to suggest new organisational structures that will result from the redesigned business processes.

The organisational structures are highly complex to model. On one hand we have modern forms of organisational models consisting of agents, networked organisations, etc.. On the other hand the traditional hierarchical view of the organisation is here to stay in spite of many critiques.

The workflow pattern seen in many organisations describes the organisation “as a system of flows” [Mintzberg 1979] joined together by different flows – such as authority, work material, information and decision processes. An organisation can be viewed as a system of organisational units or groups with work flowing from one unit to another. This approach can be represented at the meta-modelling level in terms of flow between work units or as a flow between business objects.

From the design point of view the analyst needs to classify and represent different types and directions of flow. Such a pattern is too abstract to be applicable to many types of organisational structures. A more general structural pattern of today’s organisation represents the enterprise as a collection of units (e.g. departments), which are further decomposed into smaller organisational teams or units. In this type of traditional model the flow of authority and decision making is still organised hierarchically. This is where the contradiction with the business process design discipline emerges: the BPR approaches depict the flow of material and information from one organisation unit directly to another, however the flow of authority and decision making still remains hierarchical. The analyst will tackle such issues and will have to design an organisational structure that is able to achieve an optimum overall use of resources. A lot depends on enterprise goals which are expressed in maximum or minimum terms, which will eventually lead to an optimised business process.

### 3.1 The Impact of Information Technology on Organisations

Introduction of IT into an organisation will not just result in task automation but will affect the individuals and company at all levels. It may help to enhance the employee’s skills, it may lead to employee empowerment or it may even make the employee redundant. However looking at long-term positive aspects the IT will improve the quality and the nature of work and enhance people’s skills. The technology will affect the organisational structures and will allow the enterprise to introduce new patterns of work organisation, for example virtual teams. Task automation affects the job design and division of labour. The new computer-literate employee will be in effect an ‘information processor’ – he will have to access, collate and analyse information and make decisions. Another way is to refer to such employee as a ‘knowledge worker’ [Mumford 2000]. Knowledge workers are predicted to be the largest occupational growth group.

The efficiency of enterprise in large depends on the effective utilisations of information and communications technology. In the past decade a large number of business management literature has advocated various ways of managing the organisational transformation. With IT playing an important role in enterprises, many attempts are made to establish a deterministic relationship between the two areas, the organisational structures and the information systems [Meel 1993]. Viewing IS as just a means of automating existing processes is no longer sufficient. It is becoming apparent that IT and organisational structures should be viewed from the design point of view, as outlined in section 1. In other words, IT is an enabling technology for the design of processes that would not be possible without and interaction between IT and the organisation. There are many ways of looking at these interactions. The impact of advanced IT on the structure of an organisation, in particular the administrative structures is widely felt. The outcomes may be as follows:

- A flatter and hybrid organisation structure

When IT is used to empower the employees, it results in a flatter organisational hierarchy with fewer levels, and structures that are neither centralised nor decentralised (hybrid). The speed and effectiveness of decision making process are improved. The new structures provide the means of centralisation and decentralisation of processes. In a centralised environment employees will have greater access to technology thus giving them more information on which to base decisions. Alternatively, in a decentralised environment, if the company wants to increase participation and autonomy of its employees, a higher degree of access to information technology is expected. The issues of centralisation/decentralisation are highly dependent on the corporate culture and management philosophy of the organisation.

- Improved co-ordination and collaborative work

In today's global working environment the information and communication technologies enable managers in different locations to communicate with one another and be aware of activities and outcomes of others. Technologies such as workflow, electronic messaging system, groupware and executive information systems enable easier communication and encourage a team approach to work.

- New patterns of tasks workload

A number of routine and repetitive tasks performed by the employees can be significantly reduced with the help of automation. This will give more opportunity to employees and firms, thereby enabling them to pursue more challenging, professional and intellectual work.

- Larger staff ratio of computer literate personnel

Implementation of a sophisticated information systems demands that employee have to be highly trained in order to work with and maintain these complex systems. This leads to replacement of unskilled personnel with professional personnel or increases in intensive training of less skilled staff.

### 3.2 Organisational Analysis

When analysing the organisation a number of important practical issues are raised. To illustrate some of these points, consider an example of the '*responsibility*' relations that arise within an organisation. To examine the issue of *responsibility* an example of an organisational chart is given in Figure 2. As with many organisational charts a hierarchical representation of the job level exists. The job level is usually distinguished by the vertical spacing. The horizontal spacing indicates that functions are primarily on the same level. Each element of the chart represents some business function. The subordinate relationships such as authority can usually be traced along the connecting lines. Such charts can eventually be decomposed to very low detail which will represent individual employees.

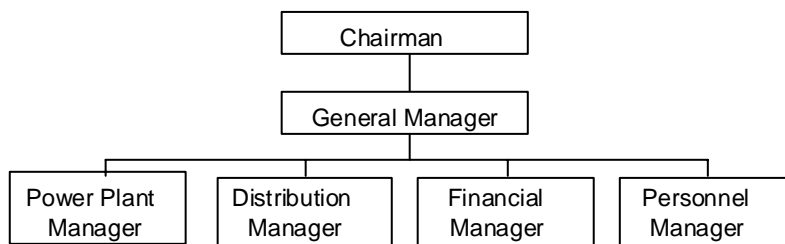


Figure2. Example of Organisational Chart

However, other types of connections can exist in the organisations apart from the hierarchical management style relationships. For example, if examining the responsibilities of the Financial Manager, other types of responsibilities can be detected such as the functional (job position) responsibility and responsibility for other activities. These two main types can be distinguished as:

- Responsibility for the artefact

this relates to a formally defined responsibility for the artefact or the deliverable of the enterprise such as goods or services. For example, a Financial Manager may assume responsibility for a Business Unit.

- Operational responsibility

This refers to the functional responsibility for the application. In the given example the functional responsibility of the Financial Manager remains to his formal job position, which remains intact in spite of other duties or responsibilities that he may assume in the enterprise.

Other lines of responsibilities can be detected such as reporting/authority and management responsibilities. The business analyst must approach the charts with caution – they may represent the formal lines of communications, but they may not be indicative of the informal communications occurring within the enterprise. Such charts do not relate to the core business process. In today's method of working the business process is seen as crossing the formally defined functional boundaries. A working group is normally being established in the enterprise to fulfil a specific business objective. In reality a more informal approach may be used to bring people together for the specific purposes of solving problems that may arise. While a formal method may be defined by the management showing ways to solve a particular problem, an alternative viewpoint may be assumed by the practitioners. The true aspect of how the organisation is perceived to be working and how it is working in reality must always be considered. The design methods (requirements engineering methods in particular) must allow for the assertion consistency check. The design model must be representative of alternative points of view.

In modern enterprises the work organisation comprises both the individual and collaborative work. Work is allocated formally to teams. Teams communicate with each other through the flow of information and materials. In order to be successful, organisations continually redefine job description and expectations placed on individual employees. However, in order to stay competitive and successful it must be flexible enough to allow for the creative abilities of the individuals to emerge and succeed for the overall benefit of enterprise. The aim of the analyst in this case is to be able to correctly 'disentangle' and identify the main players and their interactions. By relating to this subject formally he must think in terms of defining the key entities (or objects) and their relationships which will eventually result in the representations in the model of the organisational structures. A number of objects and relationships are defined thus eliciting the key components of organisation's structure. A number of representation formalisms is developed to serve this purpose. Popular examples include – 'Agent', 'Role', 'Job', 'Position', 'Organisational Unit' and others. It becomes possible to produce formalisms capable of representing these concepts that can successfully be used for the analysis of the organisational structures and their interactions.

### 3.2.1 *Organisational Dynamics*

The organisation should be viewed as a business process. Therefore apart from examining the static organisational structures of the enterprise the analyst must also consider the organisational dynamics. Adoption of a dynamic modelling approach in solving organisational problems has been suggested by a number of researchers. The design should be linked to the actual organisational problem. The aim of the analyst should be to produce a design that will address the problem and also result in a better functioning of the organisation. The analysis and design process must provide contingencies for change not only in the business tasks but in the related organisational design. In this regard, Galbraith points "that we should see organising as a continuous management task like scheduling, budgeting and so on. As managers plan their tasks and strategies, they should plan their organisations" [Galbraith 1987]. This statement implies that the organisation units should not be viewed simply as objects or units, but rather as processes where the existence of each business process is dictated by its ability to fulfil the enterprise objective.

### 3.3 Collaborative Work Patterns

Examples of people co-operating and working together are seen all around us. There are many ways for division of labour and adoption of interdependent and co-operative methods to carry out work that can not be carried out by an individual alone as given in [Mumford 1995]. The design principles adopted by the business process reengineering field place emphasis on the activities and the information flow. Yet sufficient attention is not paid to the social organisation of work and the needs of people. There are different ways in which people collaborate and work. The patterns for collaborative work given by Darnton are of interest [Darnton 1995]. He proposes five different ways in which people work together:

- 1) Common task - refers to a working group, in which a group of people are joined and working together (to produce some product or service or perform activity) in order to achieve a specific set of objectives.
- 2) Sequences of tasks - this refers to a workflow type of collaborative situation, when people interact together in a chain of activities. As one person or working group finishes one phase of work, the work passes to another person or group. The cycle continues until the product is finished.
- 3) Problem solving - when multidisciplinary and multi-skilled teams are working together to solve many different kinds of problems.
- 4) Command and control - refers to some predefined and established formal structures of command and control to co-ordinate a complex set of activities.
- 5) Mutual aid - refers to an ad-hoc mode of co-operation; people come to work or co-operate together for various reasons, with possibly the mutual self-interest being the common element.

The above ways of working may serve as guidelines for establishing the work patterns of the organisation. A suitable work pattern can then be designed in accordance to specific needs of the organisation. A conceptual model can be used to model work patterns specific to the organisation under consideration, for example as seen in works of Russell [Russell et al 2005].

## 4 SOCIAL IMPLICATIONS

Previous sections addressed issues that relate to formal modelling of enterprises. Today's new analytical challenges raise new topics that the business analyst will have to consider. Some of these points have not yet been incorporated into many approaches.

Introduction of the IT in the past years has raised many questions and resulted in paradoxes. When heavy investment in the latest information technology, followed by business reengineering activities have failed to bring about the desired outcomes, business practitioners and researchers have begun to examine the reasons behind the failure. Failure to consider the human dimension is seen as one of the reasons. Usually, human resources are treated as capital resources. The flaw in this logic is that human resources do not behave like capital resources.

The main motivation for people to carry out work remains the receipt of money or goods in exchange. This may be true to a certain point. There is a lot of evidence that financial incentive play the part of a main motivator but only to a certain limit. Other motivations such as interest, social standing play their role. Today's reality of relationship between employer and employee shows that the employer has more power. Modern fast moving digital driven economy has a direct impact on employees' job security, promotion and career prospects. Mumford claims that there is growing number of dissatisfied workers, and this may have implications for business and society of the future [Mumford 2000].

As Pemberton states "It is not human resources that organisations need, it's resourceful humans" [Pemberton 1996]. It also becomes clear that some of the methods of the nineties (such as downsizing)

have not only adversely affected the human resources, but have depleted the conditions in which individuals needed to be resourceful.

From the business point of view, it has been noted that customers are more likely to stay loyal to organisations, which are loyal to its employees. Staff who have been around are experienced in ways of doing business and have knowledge of the product on offer. Such commitment and motivations should be encouraged as it affects the staff performance and goals driving them beyond the demand of an appraisal objective. By rebuilding the relationship between the employee and employer, organisations can achieve business advantage. Business analysts believe that trust has an economic value. Increase in employees' job security, training and skills development on the part of organisation will be evenly matched by the increase in commitment and loyalty on the part of employees.

## 5 CONCLUSIONS

This paper laid a philosophical foundation for introducing and integrating organisational design discipline into the business process design. This work considered the Business Process Level view.

The research approach presented is pluralistic in nature, as it attempts to integrate previous work and ideas from a number of relevant disciplines of socio-technical and business process designs. In this way it is possible to overcome the deficiencies of some disciplines, while taking full advantage of others.

Using philosophical foundations described in this paper it is possible to produce a specific business modelling framework consisting of relevant modelling formalisms, for example as outlined in [Amin & Loucopoulos 2005]. These formalisms can for example represent entities such as roles, actors, relationships, etc.

Therefore by examining the needs of an organisational dimension, the production of a design modelling framework, which supports integration of people, technology and processes can be achieved. This activity can be assisted by an automated tool that can be designed to be both platform and method independent by using modelling formalisms based for example on UML.

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