Critical issue for business area impact analysis in business crisis management: analytical capability

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Abstract

Crisis management and organizational continuity have become increasingly critical areas of competence for managers in organizations. The approach of typical business organizations to the problems of business area impact analysis (BAIA) has been fragmented. In particular, the potential problem is the lack of an analytical capability to identify business functions/processes. The research objective is to describe how business functions/processes can be identified to analyze business area impact for corporate crisis management. In order to conduct the BAIA efficiently, it is first necessary to identify business functions/processes according to a scientific approach such as that described in the Information Engineering methodology for systems development. Next, to investigate the financial impacts on business functions/processes, which level of function/process hierarchy decomposition is used as a basis must be determined.

Introduction

Crisis management, disaster recovery, and organizational continuity have become increasingly critical areas of competence for managers in the private sector, as well as for public sector, organizations. The ability of industrial and service organizations to provide financial benefits to their owners and employees and to contribute to national and regional economic recovery and viability can be threatened by significant business disruptions or loss of consumer confidence. Natural disasters can disrupt the supply and distribution chains for even the best prepared businesses. Service businesses are increasingly vulnerable to electrical, communication, and other critical infrastructure failures. Industrial disasters can have significant human and environmental impacts that lead to potentially bankrupting liabilities. A crisis caused by harmful products or by product tampering can seriously injure a manufacturer of consumer products. No organization is immune to the threat of the external terrorist or the internal saboteur.

A crisis management survey has been conducted by The George Washington University and the Corporate Response Group Corporation to access the current status of crisis management preparation among the Fortune 1000 companies in the USA (CRG & GWU, 1997). The survey results imply that most companies are now changing the way they view crisis management in their own company. Seventy-one percent of companies have a crisis management plan. Their company's crisis management plans include the following functional areas: crisis communication (82 percent), security (79 percent), business continuity/disaster recovery (75 percent), health/environment/safety (70 percent), and risk management/loss control (66 percent). The above functional areas surveyed will be developed with the result to be derived from a business area impact analysis.

A Business Area Impact Analysis (BAIA) is the foundation for managing corporate crises. BAIA is important because it drives the priorities, strategies, and solutions for managing business crisis events. Without the knowledge that a BAIA provides, preparing an effective and comprehensive business contingency plan or mitigation strategy is difficult. Most importantly, it provides

management with reliable data concerning potential impacts, and establishes the basis for analyzing focal issues and decisions, ranking priorities, selecting proper strategies, and developing realistic scenarios for business continuity. Such BAIA centers on business processes which are critical in an organization.

The purpose of this paper is to describe how business functions/processes are identified and which level of business functions/processes is useful to investigate business impacts due to corporate crises in business area impact analysis.

Previous research of current practice

Research concerning business crisis management in the private sector has mainly focused on managing corporate crisis and business continuity/resumption.

Mitroff described what to do before and after a crisis (Mitroff *et al.,* 1996), an investigation of crisis-prone corporation (Mitroff and Pauchant, 1990), and four levels of crisis management (Pauchant and Mitroff, 1992). Barton was concerned with managing and communicating crises in an organization (Barton, 1993). Strohl's BIA Professional identifies the financial and operational impacts that may result from a disruption in the daily business of an organization's operations. As a result of the impact assessment, a strategy matrix in terms of risk and consequence is produced (Strohl, 1995). Comdisco's ComPLETE BIA system helps you understand how a possible business interruption would affect your business (Comdisco, 1997). DRI International defines the role of the professional and provides an outline of the knowledge the professional should demonstrate within business impact analysis area (DRI International, 1997).

The approach of prior research, current products, and current practices to the problem of business impact analysis has been fragmented with regard to the following areas:

(1) identification of critical business processes by simply interviewing in each department or environment within an organization;

(2) an obscure distinction between business functions and business processes; and

(3) the determination of a level of business process to investigate the financial

impacts on business processes due to corporate crises.

A business area impact analysis (BAIA) is mainly focused on producing business impacts, setting priorities, and strategy development rather than identification of business processes and selection of the level of business process to conduct the analysis. Accordingly, the authors have researched to answer the following issues: first, how does an organization identify business functions/processes in business area impact analysis? and second, which level of business functions/processes does an organization determine as a basis to analyze the business impacts due to corporate crises?

Data analysis

1. Survey
The survey is designed to gather some information about how the organization identifies business processes in order to analyze the business impacts due to various types of corporate crises. Of the nearly 120 contacted, 46 organizations agreed to respond and represented a sample spread across several key industries as shown in Table I. The survey asks for activities of business impact analysis conducted in organizations. It shows that 27 organizations (59 percent) conduct business area impact analysis, 17 organizations (37 percent) do not conduct it, and two organizations answer "do not know".

2. Results
Twelve organizations (71 percent) of 17 responders develop crisis management plan without BAIA. Twenty-one organizations (78 percent) of 27 answers which conduct BAIA are that vice-president is the highest level of executive involved in business impact analysis efforts. Only 16 organizations (59 percent) of 27 responders differentiate between business

Table I Surveyed organizations

Sector	BAIA	Non-BAIA
Finance	6	2
Manufacturing	6	2
Other private sector	10	7
Government agency	3	2
Education	0	2
Other	2	2
Total	27	17

functions and business processes and eight organizations (30 percent) assume all of them as business processes. Thirteen responders (48 percent) of 27 organizations determine business functions and/or business processes by manager's experience in each department or environment within his organization. Eight responders (30 percent) of 27 organizations identify business functions and/or business processes by conducting function/process hierarchy decomposition related with business areas. Only one responder selects business functions and/or business processes from computer based information systems. To investigate the financial and/or operational impacts on business functions/processes, top level functions (44 percent), or lowest level functions (7 percent), or top level processes (11 percent), or top level functions and top level processes (7 percent) are used as a basis level.

3. Critical problem

The survey results may be decomposed as shown in Figure 1. The kind of problems that exist in BAIA activities are implied by the Figure.

Only eight organizations (50 percent) of 16 responders who differentiate business functions and business processes use function/process hierarchy decomposition method. The other organizations determine business

activities by managers' experience. Six organizations among the eight organizations view top level functions, or top level processes, or top level functions/processes as a basis level to analyze business area impact according to the identified business crises. Only seven organizations (26 percent) of 27 responders describe how many business functions and business processes are operated to do their business. Also, only four organizations (15 percent) of 27 responders show one example of business process architecture which they have decomposed in their business area such as marketing or manufacturing or accounting etc.

This survey indicates that most organizations do not have a structured approach to determine business functions and business processes as conducting BAIA. The main problem is the lack of an analytical capability to identify business functions and business processes. Thus, it is difficult to determine which level of business function/process hierarchy decomposition related with business areas is used as a basis level to investigate business impacts.

Analytical process

Information Engineering (IE), a comprehensive system development methodology, provides a structured approach to identify

Figure 1 Survey results decomposition
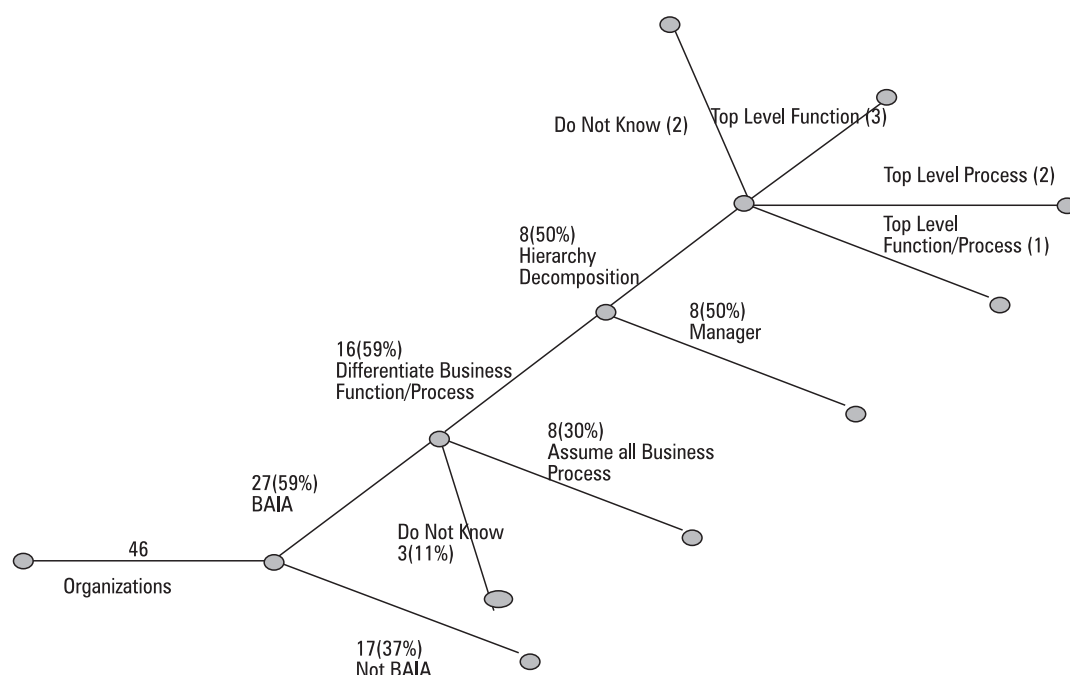
business functions and business processes. It provides techniques for identifying and organizing business requirements at the highest possible level. The techniques conceptualize systems and data. Examples include basic flowcharting; functional decomposition; structured programming, design, and analysis; data modelling. These techniques have enabled developers to deal with problems and their solutions at increasingly higher levels of abstraction in an increasingly higher-quality conceptual framework (Texas Instruments Inc., 1990). The determination of business functions and business processes is described by the functional decomposition method which is shown in IE.

Identify business function/process

A business area is an area of interest to the organization centered on a major resource, product, or activity. It is a collection of closely related data, activities and the interaction between them. Information Engineering recognizes two kinds of business activities. Higher level activities are called functions and lower level ones are called processes. The difference is that the execution of a process has meaning; it is an activity with a beginning and an end and reflects a set of executable steps. A function, on the other hand, is defined at too high a level of abstraction for its execution to have meaning (Martin, 1990) (Texas Instruments Inc., 1990).

Process modelling is a method of defining business process architecture by identifying major processes and dividing them into linked sub-processes. The process modeling is an essential part of system development because it helps clarify the problem the system attempts to solve and the way it goes about solving that problem (Alter, 1996). Because the process model records the things the business performs, creates value for internal or external customers, and represents fundamental concern for how the corporation operates, the modelling is an essential step in assessing business impacts due to corporate crises.

Construction of the process model for a business area involves the continued decomposition of the function/process hierarchy until the analyst has identified the lowest level processes of interest to the business. The highest-level business functions are groupings of activities that deal with the business areas in the organization. The functions can be

subdivided into processes. The two concepts dovetail in this way: in a function/process hierarchy, functions decompose from the top-level functions to the lowest-level functions. Lowest-level functions decompose into top-level processes. During business area analysis, these top-level processes eventually decompose into lowest-level (elementary) processes (Texas Instruments Inc., 1990). Some examples of function/process hierarchy decomposition appear in Figure 2.

The distinction between functions and processes at either end of the spectrum is usually fairly obvious. However, the demarcation between lowest level functions and top level processes is not always so clear. In such a case, the planners have to use their own judgment in deciding whether or not an activity is executable.

For example, a financial company shows ten major functions: buying assets, selling assets, issuing securities, other capital market activities, issuing debt, collecting money, distributing money, direct support of business unity, providing services to mortgage sellers/servicers, and other activities. These ten top level functions are, for example, further decomposed to 40 lowest level functions, to 70 top level processes, and to 400 lowest level processes. One oil shipping and transportation company lists its functions as follows: planning, product development, marketing, manufacturing, distribution, finance, and administration. These seven top level functions are decomposed into 48 top level processes.

Which level of business activities

Table II shows that the surveyed organizations use which level of business activities as a basis level to analyze business area impacts. Although five organizations assume business activities as business processes, and do not differentiate between functions and processes,

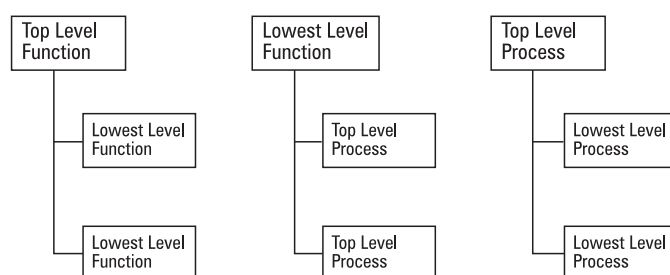**Figure 2** Examples of function/process hierarchy decomposition

Table II Basis level to analyze business area impacts

Which level	Organization
Top level functions	12
Lowest level functions	2
Top level processes	3
Lowest level processes	1
Top level functions/top level processes	2
Other (critical functions)	1
Do not know	6
Total	27

they indicate that top level functions are used as a basis level. Accordingly, these organizations are involved in 12 organizations which use top level functions as a basis level. This survey shows that most organizations investigate business area impacts at business function level rather than business process level.

When contingency planning projects in Korean public organizations for preparedness of computer/network breakdown are conducted, the following fact is found. In a function/process hierarchy as shown in Table III, functions decompose from the top-level function to the third-level functions. Third-level function decomposes into top-level processes. Data related with business continuity planning such as business operation team, customer, vendor, equipment, software, supplier, telecommunication, vital record, and location (Strohl Inc., 1995) are gathered on the basis of business process. In Table III, data in terms of each four top-level process are the same. However, it is different at third-level functions. Thus, third-level function is determined as a basis level to analyze business area impacts.

It is necessary to decompose business areas in detail in order to estimate the impact on the organization based on business functions/processes being interrupted. Determining the degree of decomposition required to make this determination is a difficult modeling decision. The business process modeling methods developed for information engineering where the goal is to build or to re-engineer a system provide too great a level of detail. The objective of a business continuity process analysis is to provide enough detail to identify critical process and critical information flows. Further decomposition is dysfunctional. It is important to determine the most appropriate level of business process modelling as a basis level to analyze business area impacts.

Conclusion

The business area impact analysis is the foundation for developing corporate crisis management plans. An important problem of BAIA is the lack of an analytical process to identify business functions/processes. Accordingly, it is difficult to determine which level of business function/process hierarchy decomposition related with business areas is used as a basis level to investigate business impacts. In order to carry out the BAIA efficiently, it is first necessary to identify business functions/processes by the continued decomposition of the function/process hierarchy in the business areas with which the business deals. Second, which level of function/process hierarchy decomposition is used as a basis must be determined to investigate the financial impacts on business areas. This research recommends business function level of business process modeling as a basis level to analyze business area impacts within an organization's environment.

Table III An organization's function/process hierarchy decomposition

Top level function	Second level function	Third level function	Top level process
			Duty-free auto
			Illegal auto
		Toll collection management	Fleeing auto
			Toll collection
		Highway sales plan	
Sale management	Highway sales management	Salesman management	
		Toll rate	
		Sales policy	
		Transit card management	
		Sales evaluation	
	Facility sales management		

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