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## ***Balance in Business Reengineering: An Empirical Study on Fit and Performance***

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# Balance in Business Reengineering: An Empirical Study on Fit and Performance

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**ABSTRACT:** This study addresses the complex relationship between fit and organizational performance in business reengineering. First a framework for analysis is proposed which is based on the concept of fit. Three generic archetypes for three levels of ambitions are defined. Archetypes or ideal-type patterns of change are consistent packages of design and change management measures. It is hypothesized that organizations which change according to an ideal-type pattern outperform organizations that follow a different, inconsistent pattern. Based on a questionnaire sent to organizations involved in reengineering, this paper shows that consistent reengineering endeavours generally result in higher benefits than do inconsistent change efforts. It also demonstrates that only a minority of organizations has succeeded in creating a ‘magical mix’ between the level of ambition and the design and change management measures actually taken. Finally, the managerial implications and future research challenges are described.

**KEY WORDS AND PHRASES:** business reengineering, fit, organizational change, organizational performance

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Management and organization literature is imbued with the notion of ‘fit’, ‘match’ or ‘balance’. Organizations are urged to align their strategy to their environment, to bring internal factors like structure, systems, style and culture into line with their strategy and to maintain a balance during the process of organizational change [9, 28, 29, 37, 43, 50, 51, 54]. Business reengineering literature is no exception to this rule [15, 27, 34, 39, 69]. While these theories vary widely in subject matter, they share the common proposition that an organizational outcome is the consequence of a fit between two or more factors or dimensions [65]. Conversely, misfits or mismatches between such dimensions are held to reduce organizational performance.

The notion of fit is not just a theoretical stance lacking any practical relevance. On the contrary, our study, to which we will later refer, shows that 90% of the respondents affirm that ‘management by matching’ [9] is the critical success factor in reengineering. Moreover, many cases presented in reengineering literature implicitly or explicitly provide anecdotal evidence supporting the idea of fit [11, 26, 62].

With so much theoretical attention and practical relevance, the notion of fit would seem to be common sense rather than a matter for vehement debate; however, there are three reasons to contradict this. First, achieving fit is a fragile process [50, 51]. Mismatches easily occur. Therefore fit should be a matter of central concern to both academics and practitioners. Second, most empirical studies on reengineering lack a multidimensional view [10, 14, 21]. They are directed towards the identification of single critical success factors, such as the commitment of top management or intensive communications, whose mutual interactions are not investigated at all. Neglecting the notion of fit, they leave the process of achieving fit to the intuition of the manager. Third, in the search for explanations for organizational performance there is a continuous debate as to which dimensions need to be balanced [12, 36, 37, 49]. For instance, in reengineering literature, the relationship between organizational performance and the breadth and depth of change processes has been studied [31]. However, many of these studies can be criticized for focusing on organizational design and ignoring change management issues. Only recently is change management beginning to receive the attention it deserves [30, 35].

With this paper, we hope to contribute to the debate on fit and its relationship with organizational performance. Our goal is to synthesize findings from previous literature on organizational design, change management, performance and business reengineering into a coherent framework that will help managers achieve fit in complex change processes. We also conducted an empirical study to validate the framework. The framework was operationalized into a questionnaire that was sent to change managers experienced in leading business reengineering projects or programs. The following

questions have guided us in our study:

- 1) Do organizations which achieve fit in a business reengineering change process outperform organizations that change in an unbalanced way?
- 2) Is there evidence that reengineering success depends on the number of misfits which emerge during the change process?

The first four sections of this paper are devoted to the development of our framework. The fifth section reviews the applied research methodology and elaborates on the operationalization of the distinguished dimensions of organizational change. In the next section, the main findings of our empirical study are presented. The paper concludes with the managerial implications of our study and directions for future research.

### **Fit and Organizational Performance**

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Is fit in reengineering an essential factor in explaining organizational performance? To study this relationship, we first have to decide which dimensions of organizational change will be included in the concept of fit. In our framework, five dimensions are distinguished: level of ambition, breadth, depth, planning and co-ordination of the change process (see figure 1 for the complete framework). As will be explained in the next sections, level of ambition is the contingency factor in our study, while the other four dimensions are the independent factors. Breadth and depth relate to organizational design; planning and co-ordination concern change management issues. Each of these dimensions can contribute to reengineering success. However, treating an organization or a change process as being decomposable into discrete dimensions that can be examined separately does no justice to the complex interactions between these dimensions. The way these dimensions interact can also be a vital factor explaining organizational performance [50, 65].

To gain an explicit understanding of the interactions between the distinguished dimensions, a measure of synthesis is needed [29, 47, 51]. Archetypes or ideal-type patterns of change can serve this purpose [65]. By archetypes or ideal-type patterns we mean consistent packages of design and change management measures that correspond with the level of ambition set. To account for the fact that organizations differ in their level of ambition, our framework consists of three archetypes. It seems logical to assume that an appropriate set of design and change management measures varies with the level of ambition [3, 62]. Metaphorically speaking, climbing the Mount Everest simply demands a more powerful arsenal of measures than climbing a sand dune. We therefore distinguish between organizations with relatively low, medium, and high ambitions. As can be seen from figure 1, the matching archetypes are labelled the 'local project', the 'cross-functional project', and the 'company-wide program'. These labels reflect that an ever larger part of the entire business system is affected by

the reengineering effort.

Figure 1. Hypothesis in level of ambition contingent model

Contingent Factor

Level of ambition

Independent Factors

Breadth

- number of operational functions redesigned

Depth

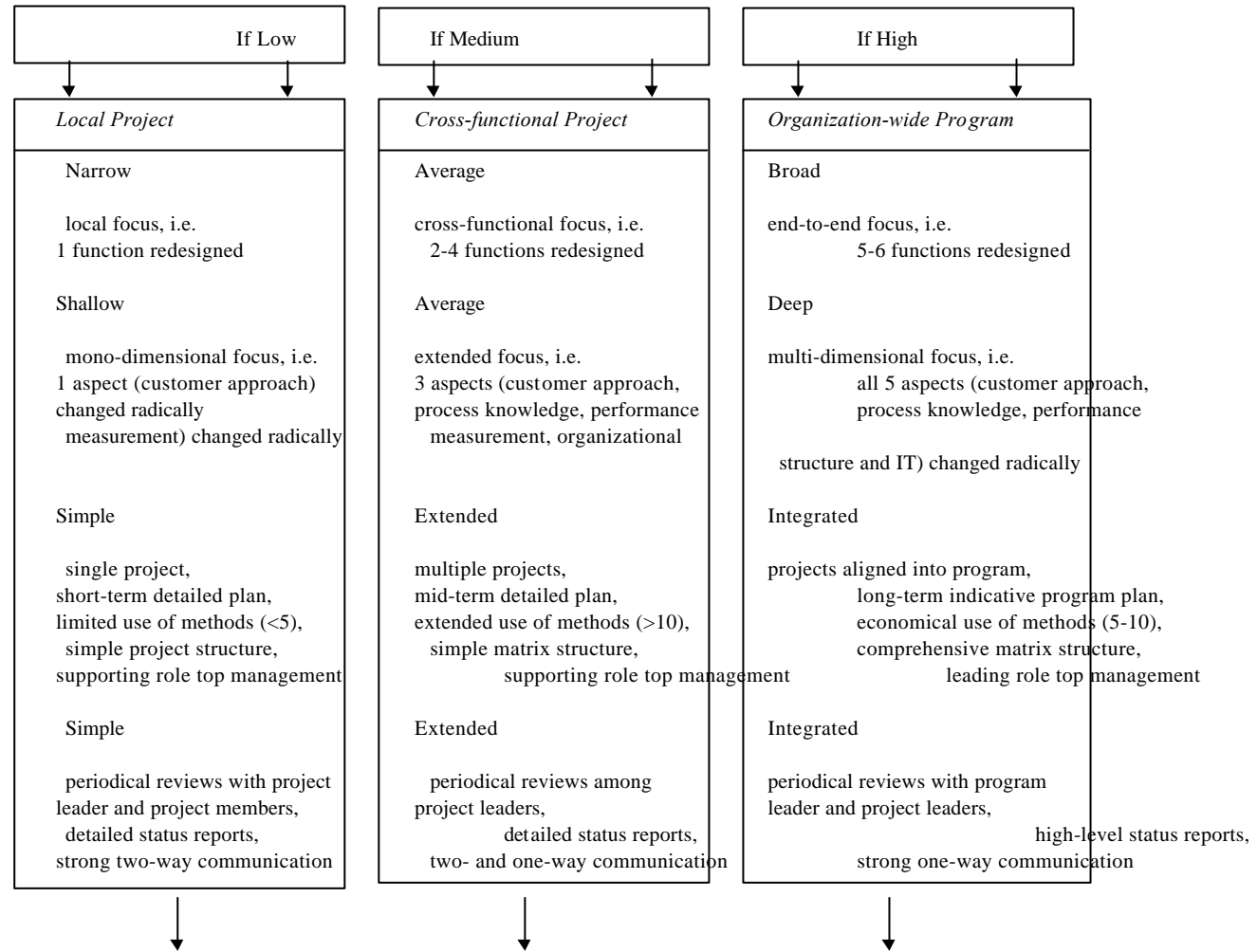
- number and kind of organizational aspects changed radically

Planning

- number and alignment of projects  
 - specification of change plans  
 - methodological support  
 - formalization of change organization  
 - role of top management

Coordination

- formalization of project meetings  
 - standardization of project meetings  
 - nature of communication with people involved



Dependent Factor

**Performance With Above Pattern**

High

High

High

**Performance With A Different Pattern**

Low

Low

Low

The first archetype stands for an incremental, bottom-up, narrow change of an existing process within an operational function that requires relatively simple change management measures. From the perspective of the total business system, a local project leads to minor adjustments such as locally improved customer contacts. These minor adjustments, however, should be sufficient to realize the relatively low ambitions of the organization. The second archetype reflects a middle-out, average change focused on the interdependence of activities across distinct functional lines that demands extended planning and co-ordination measures. It leads to a radical change in a substantial yet distinct part of the organisation. The last archetype describes a top-down, large-scale reengineering effort. To achieve the relatively high level of ambition, the focus is on transforming the whole business system, which places high demands on organizational design and change management.

The three archetypes reflect how the notion of fit has been conceptualized. If organizations succeed in combining the distinguished dimensions into an ideal-type pattern of change, they achieve fit. If they deviate from such a pattern, our framework suggests that they will suffer from one to four misfits. In that case, the breadth, depth, planning and/or co-ordination dimensions are not properly synchronized with the organization's aspirations. Such misfits or deviations are hypothesized to lead to reduced performance.

*Hypothesis: The three ideal-type patterns of change are models of success that will outperform any other pattern*

The archetypes enable us to make a distinction between organizations that change according to an ideal-type pattern and organizations which follow a different pattern, i.e. organizations that face at least one misfit. To test the hypothesis, the resulting groups of (what we have called) consistent and inconsistent organizations have to be compared with each other on the basis of a measure for reengineering success. Reengineering success, the dependent factor in our framework, is defined later. The organizations studied can also be grouped according to the number of misfits they faced. These groups can be correlated with the success measure to show the effect of a growing number of deviations on reengineering success.

In the next three sections the archetypes are further illustrated and underpinned. Each archetype consists of four 'mini-patterns' which relate to the breadth, depth, planning, and co-ordination dimensions. These dimensions are defined and the mini-patterns are specified. The definition of a measure for reengineering success concludes our framework.

## **Level of Ambition: The Contingency Factor**

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The process of achieving fit begins, conceptually at least, by aligning the organization to its environment [50]. If a strategic gap is perceived, organizations normally reflect on current performance and the improvements needed. By stating their ambitions, organizations try to bridge the gap with the environment. At the same time, a gap is revealed between the organization's ambitions and its resources [32]. This second gap has to be closed by taking appropriate design and change management measures [27, 31, 33]. Therefore achieving fit not only means that the strategic gap has to be bridged; it also implies that the package of reengineering measures is properly attuned to the level of ambition. The level of ambition is therefore the pivot or contingency factor in our framework. This paper discusses only the relationships between ambitions and the set of measures with which organizations hope to achieve the improvements needed. Whether organizations actually succeed in closing the gap with the environment as a result of reengineering remains outside the scope of this paper.

In this study, the level of ambition is determined by the number and size of the intended performance improvements and whether or not a sustainable competitive advantage or breakpoint is pursued (see figure 2). This definition is based on three general considerations found in reengineering literature. First, with regard to the kind of performance improvements to be pursued, managers are stimulated to listen to customers to hear the value they put on products and services [15, 37, 39, 64]. Since value to the customer cannot be assessed in purely financial terms [39], the level of ambition will typically express a multitude of financial and non-financial value metrics, such as reduction of cost and improvement of customer satisfaction. Second, in order to motivate and mobilize the organization and to enhance the tangibility of an organization's strategy, it is emphasized that managers quantify their aspirations [7, 16, 34]. Finally, to gain market dominance, organizations are urged to strive for a breakpoint, i.e. to pursue excellence in one or more of the relevant value metrics [39, 63].

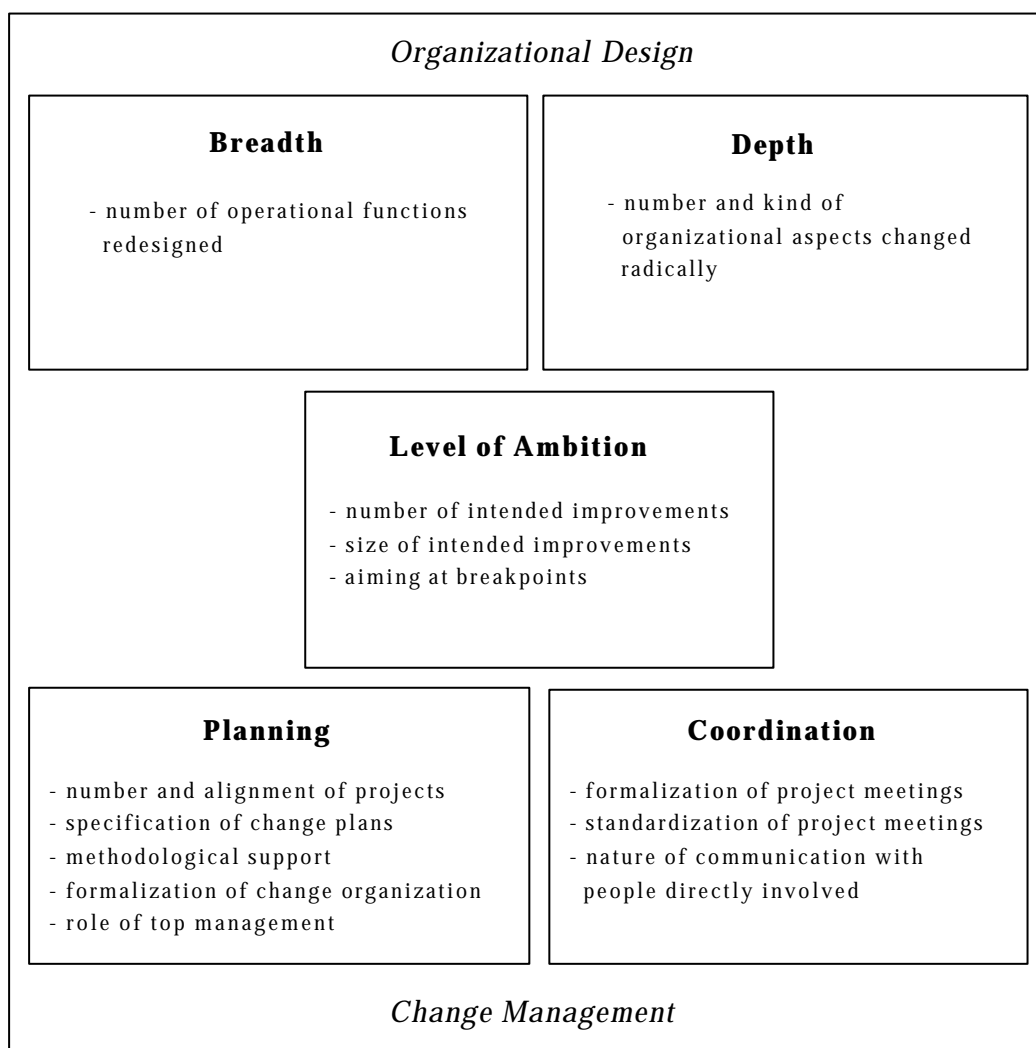
In other words, reengineering literature stimulates organizations to pursue a high level of ambition, leading to a radical change that places high demands on the design and change management measures to be taken. However, not every organization wants to change radically, is able to do so, or has the courage to do so. In practice, organizations trade-off the need to change, the ability to change and the risks involved in changing the organization [4], and this process leads to different levels of ambition. As we have said, we account for these differences by dividing the organizations studied into three groups: those striving for relatively low, medium and high ambitions.

## **Breadth, Depth, Planning, Co-ordination: The Independent Factors**

---

Regardless of which level of ambition organizations choose, aspirations have to be translated into an appropriate package of reengineering measures. In this section, we argue that these measures can be arranged into four dimensions of organizational change: breadth, depth, planning and co-ordination of the change process. Breadth and depth apply to organizational design; planning and co-ordination relate to change management issues. These four dimensions and level of ambition, together with their constituent elements, are included in figure 2.

*Figure 2. Dimensions of organizational change*



## **Breadth**

Delivering value to the customer seems to be the strategic imperative of the 1990s. Consequently, reengineering has to result in performance improvements which are clearly recognizable to customers. This requirement puts business processes at the centre of theoretical and practical attention, for it is at the operational level that products and services are delivered to the customer [39]. Before embarking on reengineering, the activities that are critical for value creation have first to be identified. It has then to be decided which critical activities will be included in the change process.

We describe breadth as the number of critical activities or operational functions tackled in the reengineering effort (see figure 2). Inspired by Porter's value chain [58], six critical activities are distinguished: procurement, inbound logistics, production, marketing and sales, outbound logistics, and service. A business process is one sequence of functional activities [15, 39, 41]. Such business processes are central to business functioning and have a direct relationship with the external customer. Changing a business process or parts of it inherently affects the management and support functions that are related to the operational functions involved.

Consequently, breadth can be defined as narrowly as a single operational function or as broadly as entire business processes [31]. Archetypically, we expect that less ambitious reengineering efforts will be restricted to one operational function, moderately ambitious projects will involve two to four operational functions, and highly ambitious company-wide programs will include most, if not all, critical activities. In this way, a basic assumption underlying reengineering is made concrete: the higher the ambitions, the more critical activities should be taken into account [18, 31, 34, 39, 41]. Achieving breakthrough performance improvements requires the re-integration of traditionally fragmented business processes.

## **Depth**

Reengineering triggers changes of many kinds, not just of business processes themselves [33]. To achieve substantial performance improvements, anything associated with the business process should be refashioned in an integrated way [31, 39]. In this regard, all kinds of innovative ideas or design options stemming from a range of academic disciplines might prove useful: mass customization, self-managing teams, the division of the organization into front and back offices, supporting processes with new technologies, the balanced scorecard, activity-based costing and so on [25, 42, 56, 60, 61]. However, a danger of such single options is that they will live a life on their own in separate corners of the organization. It is the challenging task of the redesign team to fruitfully combine such options into a logical and consistent new organizational design. The redesign team also has to decide on the radicalness with which the design options have to be applied.



By depth we mean the number and kind of organizational aspects or levers that change profoundly as a result of reengineering (see figure 2). To analyze this dimension, we have combined 50 design options described in the aforementioned literature into five organizational aspects: the customer approach, process knowledge, organizational structure, information technology, and performance measurement (for examples of the used design options, see the appendix).

Changing the organizational aspects has to contribute to the behavioural change needed to achieve the ambitions set for the change process. It is generally assumed that the higher the ambitions, the more organizational aspects should be changed radically [3, 31, 34, 39]. It is also suggested that customer and process-oriented change levers have more impact on organizational performance than do investments in other levers [5, 13, 30, 52, 60]. In fact, reengineering literature warns against traditional restructuring or information systems improvement [15, 34]. We therefore hold that every kind of reengineering, including *less* ambitious change efforts, should focus first on the customer. For *medium ambitions*, radical changes should also be sought in building up process knowledge and new performance measures to reinforce the reassessed relationship with the customer and the business process perspective. Creating supporting performance measures can strongly affect organizational behaviour in a desired direction [42]. On top of this, *highly* ambitious reengineering initiatives should embed these changes in radically new organizational structures and information systems by applying design options like delayering, decentralization, shared databases and systems integration.

## **Planning**

Reengineering efforts have to be prepared and structured to force implementation of the new organizational design [3, 30, 35, 66]. In this regard, many planning decisions have to be made. It has to be decided whether change activities can be grouped into one or more autonomous projects or whether they need to be aligned into a formal change program [41, 57, 67]. Other planning issues involve the phasing of change activities into short-term, midrange or long-term change plans [3, 38], and the number and kind of methods and techniques that will be applied to specify these plans [14, 31, 34]. Change can also be achieved within the existing hierarchy or through the establishment of temporary governance structures, which can vary from simple project structures to comprehensive matrix structures [45, 46]. Finally, it has to be decided at what hierarchical level the change leader role should be fulfilled, and consequently, what the most appropriate role for top management is [38, 66].

With respect to the planning dimension, we refer to five change management measures: the number and alignment of projects, the specification of change plans, the methodological support of change managers, the formalization of the change organization, and the role of top management (see figure 2). In view of the level of ambition, managers have to decide upon these planning measures in order to guarantee a firm and effective grip on the change process. It is assumed that the higher the

ambitions, the higher the demands on the preparation and structuring of the change effort [48]. Naturally, the larger the number of change activities and people involved, the greater the emphasis should be on aligning the change activities and formalizing the change organization to keep the change effort manageable. These considerations underpin the following ‘mini-patterns’.

In the achievement of *low* ambitions, we hold that effective planning takes place by defining a single project and a detailed, short-term project plan, for which a limited number of supporting methods and techniques is used. The small project domain suggests that existing governance structures or simple project structures are effective means of uniting those involved in the change effort. Lower management leadership is assumed to be most fruitful in this kind of reengineering [5, 20], for leadership should be fulfilled at a management level that just oversees the project domain [67, 68]. In fact, active ongoing involvement of top management suggests a waste of management capacity.

In *moderately* ambitious change efforts, it is expected that multiple projects are defined that are underpinned by detailed, solid project plans for which methods and techniques are extensively used. An extended yet simple matrix structure, uniting people from different disciplines and management levels, indicates adequate structuring of the reengineering effort. In fact, comprehensive matrix structures comprising numerous steering committees and task forces should be avoided, for they can easily add to the complexity of the change process [20, 22, 46]. Moreover, in view of the enlarged project domain, middle management’s pro-active leadership is assumed to be most effective in this kind of reengineering [5, 45, 67, 68].

*Highly* ambitious change efforts need tight alignment of projects into a formal change program [6, 19, 22, 38] underpinned by a compelling vision, i.e. an indicative, long-term program plan with one or more quantified goals rather than highly detailed specifications [5, 17, 30, 34]. Otherwise, the change effort can easily dissolve into a list of confusing and incompatible projects that can take the organization in the wrong direction or nowhere at all [45]. Considering the complexity of highly ambitious change efforts, the economic use of methods and techniques to examine market and competitive realities is required to prevent ‘analysis paralysis’ [34, 38]. In addition, comprehensive matrix structures need to be established to ensure broad participation throughout the organization [38, 45, 66]. Finally, top management’s active leadership is required, for this kind of reengineering should be directed by a ‘tough-minded’ program leader with a high degree of formal authority [6, 13, 14, 31, 34, 45].

## **Co-ordination**

Facilitating communication among change managers and with ‘change targets’, i.e. those people directly affected by the changes, is crucial in the realization of change. Since reengineering often fails because project and program leaders lose focus on the scope and goals of the change effort, keeping track of change effort progress is a key issue for management [7, 14, 30]. It has therefore to be decided whether or not formal periodical reviews of the change process have to take place, and who needs to participate in these meetings: team members, project leaders and/or program leaders [66]. Decisions have also to be made with respect to the standardization of these meetings, i.e. whether detailed or high-level status reports can be used to ensure efficient information exchange and documentation. Besides, communication with those directly affected by the changes is required to overcome resistance to change [14, 34, 35]. In general, all existing formal and informal communication channels should be used to broadcast plans for change [1, 22, 31, 45]. More specifically, it has to be decided how those directly affected by the changes should be informed about the change process: by two-way communication that offers ‘change targets’ explicit opportunities to influence the course of the change process, or by one-way communication, for instance through large-scale presentations, videos and bulletins [38, 66].

By coordination we mean three change management measures used to gather and convey information needed to attune the change activities during the reengineering effort: the formalization of project meetings, the standardization of project meetings, and the nature of communication with those directly affected by the changes (see figure 2). With respect to the level of ambition set, managers have to decide upon these coordination measures in order to help sustain a greater focus on and commitment to the goals set for the change process. We expect that the higher the ambitions are, the more pressing the demands on coordination will be [6, 48, 66]. Evidently, tailored measures must be taken to prevent communications becoming either insufficient or too exhaustive.

We hold that, in the pursuit of *low* ambitions, formal project meetings between the project leader and project members, based on detailed progress reports, are sufficient to keep track of the change effort’s progress. Communication with those directly affected by the changes is assumed to entail two-way communication, for in this way higher commitment to the change process can be obtained [30]. When striving for *medium* ambitions, formal periodical reviews among the various project leaders, informing each other by written status reports, are assumed to be an effective way of attuning change activities. Coordination with the rest of the organization suggests a mixture of two-way and one-way communication, for the larger the number of people involved in the change process, the less feasible it becomes to consider all individual interests. In *highly* ambitious reengineering, the change activities need to be coordinated at the highest level in the change organization’s hierarchy. Formal periodical change reviews among the program coordinator and project leaders therefore have to

be built into the change management process to monitor the attainment of milestones at critical junctures [6, 30, 57]. In addition, these program meetings should be standardized using high-level milestone reports, for a strong emphasis on project documentation can easily draw too much attention to highly detailed matters, especially in major reengineering endeavours [38]. Such reports help to stay focused on the main issues and prevent ‘micro-management’. Furthermore, extensive and reinforcing top-down communications with those directly affected by the changes is needed in order to resolve the conflicts of interests that inevitably arise [13, 24, 38]. Consequently, rather coercive, one-way communications are required in addition to two-way communications, to prevent communications from becoming too exhaustive and compromising.

### **Reengineering Success: The Dependent Factor**

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In the previous sections, three archetypal patterns of change were described. Each archetype consists of four mini-patterns relating to the breadth, depth, planning and co-ordination dimensions. Deviations from these mini-patterns on any or all dimensions are hypothesized to lead to reduced performance. To recapitulate, our hypothesis states that the three archetypes are models of success that will outperform any other pattern. To test this hypothesis, a measure for reengineering success is needed.

Reengineering success is defined as the number and size of the achieved performance improvements. In the next section, we will discuss this measure in more detail. For now it will suffice to say that the respondents were explicitly asked to show the effect of reengineering on the overall performance of the organization or business unit. The success measure not only shows how successful each organization has been in its reengineering endeavour, it also provides us with a standardized measure to compare organizations with each other. This can be done in two ways. First, consistent organizations can be compared with inconsistent organizations, i.e. organizations that faced at least one misfit. Second, we can correlate the number of misfits that emerged in the change efforts to reengineering success. The hypothesis cannot be rejected if organizations deviating from the ideal-type pattern of change, as well as the number of misfits, are significantly and negatively correlated with reengineering success.

### **Research Methodology**

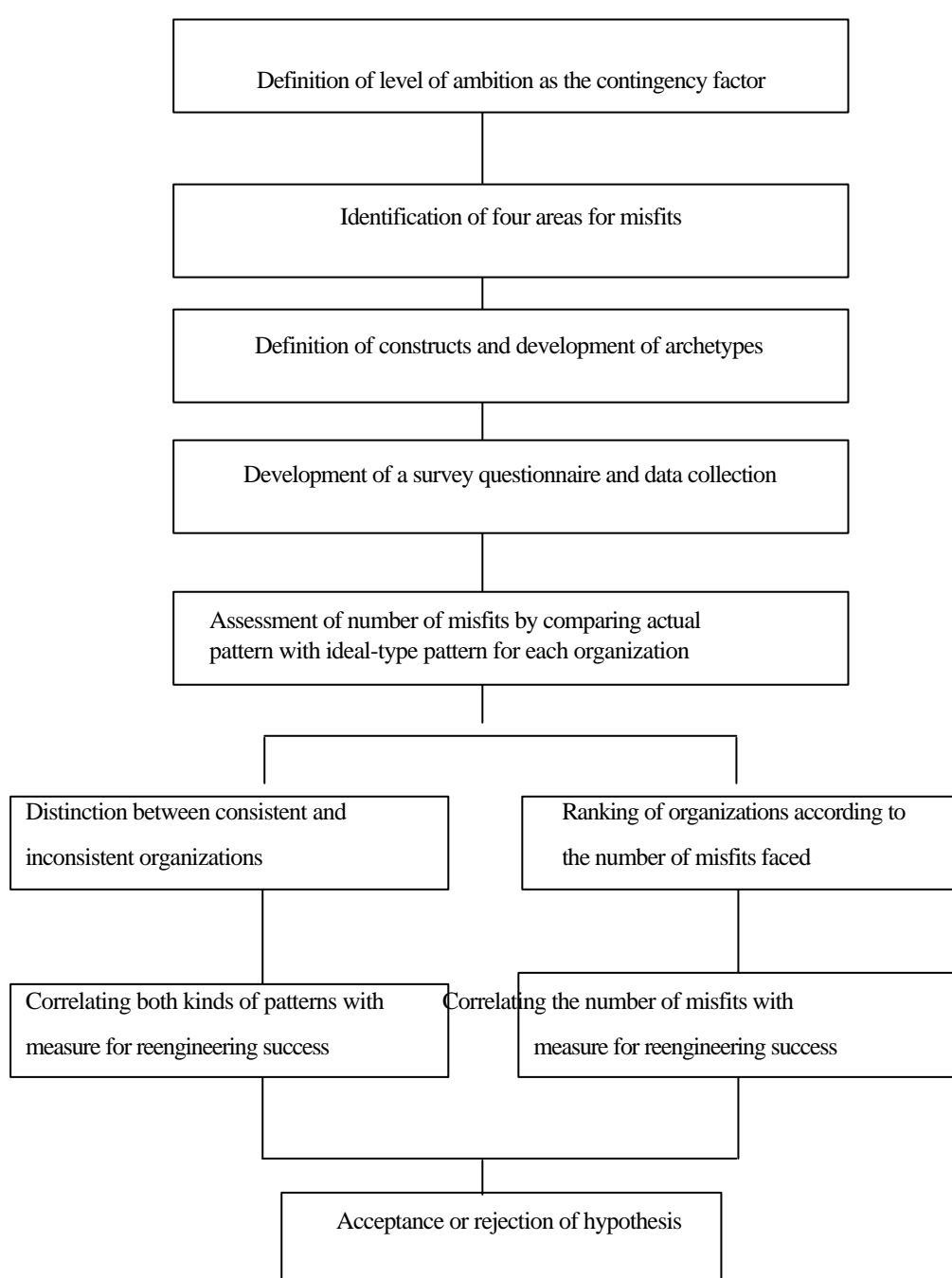
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Many previous studies on business reengineering are casuistic [11, 26, 62] and there are few empirical studies with generalizable results [30]. To promote generalizability, to achieve greater contextual richness and in search of a stronger theoretical foundation for business reengineering, the framework

developed in the previous sections was operationalized into a questionnaire. This data collection method allows for replicability and permits some degree of statistical power [40]. Figure 3 outlines the steps taken in our research design.

The 16-page questionnaire was pre-tested among several methodologists as well as in a pilot project. The revised questionnaire consisted of a mixture of closed and open questions covering the distinguished dimensions of our framework and background details of the organization and respondent. The questionnaire was constructed using five-point scales and discrete categories. Since the study draws upon relevant theories, perspectives and literature, the content validity of the questionnaire is claimed on theoretical grounds. An outline of the questionnaire is included in the appendix.

*Figure 3. Steps in the research design*



## **Research Base**

The unit of analysis in our study was the change process or reengineering effort, defined as a period in the development of an organization or a business unit in which several related goal-oriented change activities are undertaken to realize a more or less radical change in the form or functioning of an organization. Data were collected from Dutch organizations and business units. These organizations stem from the networks of the Department of Information Management at the University of Amsterdam and the Dutch Association of Business Engineers (ABE). The ABE is a leading forum for reengineering professionals in the Netherlands. Organizations were contacted beforehand to find out whether or not they were interested in participating in the research project. Two criteria were used to select respondents: they had to have practical experience with at least one reengineering effort and they had to be in a position to largely oversee the change process. The majority of the respondents fulfilled a role as project or program leader during the reengineering effort.

Questionnaires were sent to 160 organizations and business units. A total of 90 responses were returned, resulting in a response rate of 56%. Of these 90 organizations, 33 (36.7%) had completed their reengineering effort and were able to respond to the entire questionnaire. This study reports on these 33 reengineering initiatives. Table 1 shows in which sectors the organizations operate, the size of the organizations measured by the number of employees, and the current position of respondents. The organizations represent all governmental and business sectors, such as manufacturing, trade and services. A majority of the organizations operate in the service industry (51.5%). Measured by the number of employees, the data set includes small, medium and large organizations.

*Table 1. Profile of organizations and respondents*

<b>Branche</b>	<b>Percentage</b>	<b>Size (number of employees)</b>	<b>Percentage</b>	<b>Current position respondent</b>	<b>Percentage</b>
Manufacturing	12.1 %	< 200	36.4 %	CEO	21.2 %
Trade	9.1 %	200-1000	36.4 %	Line manager	6.1 %
Banking Finance	24.2 %	> 1000	27.3 %	External consultant	30.3 %
Other services	27.3 %			IT manager	21.2 %
Government	21.2 %			Other staff	21.2 %
Non-profit	3.0 %				
Other	3.0 %				

## **Operationalization of the Dimensions**

The contingency factor (level of ambition), the four independent factors (breadth, depth, planning, and

co-ordination), and the dependent factor (reengineering success) in our framework have been operationalized into constructs. In this way, the complexity of analyzing the innumerable interactions between the constituent elements of these factors (see figure 2) has been reduced to four areas in which misfits can arise.

*The level of ambition* was determined by asking respondents to indicate the number and size of the *intended* performance improvements and whether or not a sustainable competitive advantage was pursued. They could choose from a generic set of ten indicators or benefit categories: reduction of cost, cycle time, lead time and time to market, and improvement of customer satisfaction, delivery reliability, price/performance ratio, productivity, market share and information services 1). Each of these indicators could be marked or quantified by a percentage. To assess the level of ambition, the number of marked indicators was multiplied by a standardized size score of the quantified indicators, and divided by the maximum number of indicators. The resulting score was multiplied by a constant factor if a breakpoint was aimed at. Next, based on the ambition scores, the 33 organizations were divided into three equal groups: low, medium and high 2). *Reengineering success* was assessed by using the same generic set of benefit categories that was applied in determining the level of ambition. However, now the number and size of the *achieved* performance improvements were taken into account. As a result, the success scores could vary between the values 0 and 1.

With respect to the four independent factors, the following procedure was applied. In order to determine whether or not a misfit occurred on the *breadth* dimension, the indicated number of critical activities redesigned was compared with the number defined in the ideal-type pattern. With regard to the *depth* dimension, respondents were asked to indicate on a Likert-scale to what degree 50 design options were changed (1 = strongly decreased and 5 = strongly increased). To decide on the radicalness to which each of the five organizational aspects was changed, the number of design options was multiplied by points given on the Likert-scale. A depth score of more than 60% of the maximum score was held to distinguish between radically and non-radically changed aspects. This means that many design options had to be applied intensively before the changes related to any one organizational aspect was labelled 'radical'. The questions concerning the *planning and co-ordination* dimensions were closed questions with discrete answer alternatives. The answers could be directly compared with the appropriate mini-patterns. As to the methodological support, depending on the number of methods and techniques applied, organizations were allocated to one of the three distinguished categories: limited (<5), extended (>10), and economical use (5<x<10). Thus, for each dimension, a deviation of the specified mini-pattern produced a misfit 3).

## **Findings on Fit and Performance**

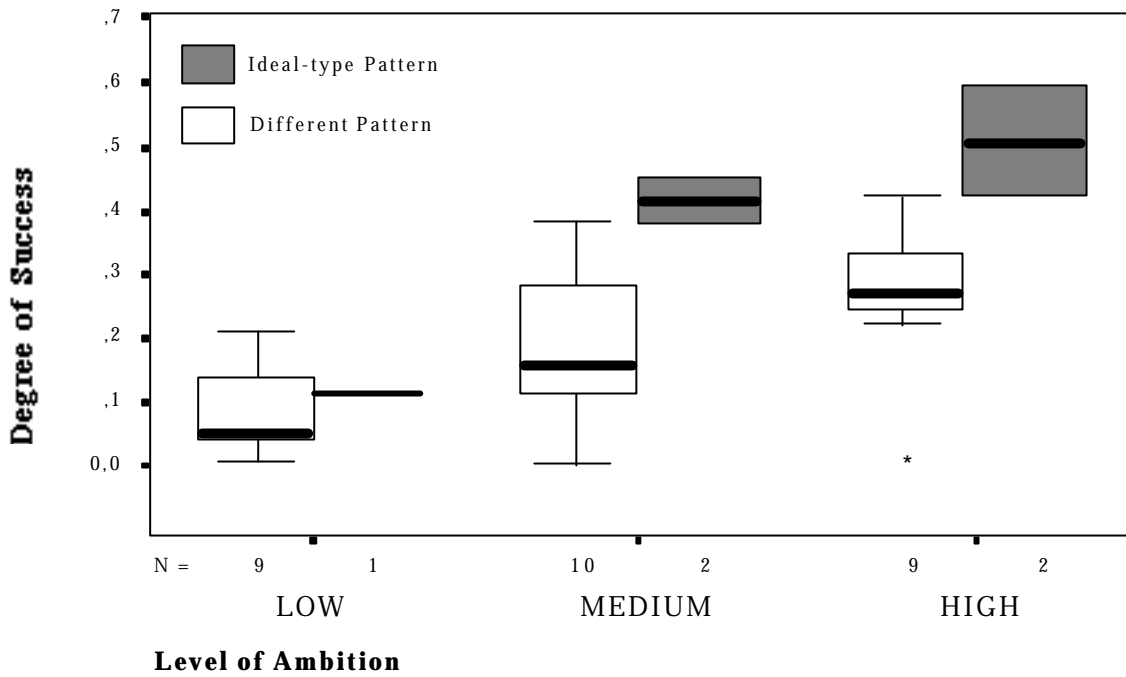
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This paper started by posing two questions: ‘Do organizations which achieve fit in a reengineering process outperform organizations that change in an unbalanced way?’, and ‘Is there evidence that reengineering success depends on the number of misfits which emerge during the change process?’. The results of our study are discussed in this section. First, we correlate consistent and inconsistent organizations to reengineering success. We then provide details on how ambitious and successful the 33 reengineering efforts studied have been. Next, we examine breadth, depth, planning and co-ordination in greater detail. Finally, we demonstrate the effect of a growing number of misfits on reengineering success.

### **Ideal Types versus Different Patterns**

In order to appreciate the balance or fit of the reengineering initiatives studied, the actual change patterns followed were compared with the ideal-type patterns that suited the chosen level of ambition. We hold that organizations are in balance if, and only if, no mismatches emerged in the process of change. Figure 4 shows that only 15% of the investigated organizations actually succeeded in achieving fit to its fullest extent. Of 33 cases, one organization with low ambitions, two with medium ambitions and two with high ambitions followed the ideal-type pattern. Others suffered from all kinds of mismatches resulting in substantial lower reengineering outcomes. In general, higher performance gains accrued when the level of ambition was accompanied by corresponding measures along the other four dimensions. The correlation between fit and reengineering success is strong and highly significant (Spearman correlation coefficient of 0.4352 with  $p < 0.01$ ). This finding, although it is based on a limited set of 33 observations, answers our first research question. Organizations which achieve fit in a reengineering undertaking generally outperform organizations that change in a unbalanced way.

*Figure 4. Patterns of change and success*



### Ambitions and Success

Most reengineering initiatives aim at and achieve simultaneous gains in a number of performance measures. There are, however, considerable differences between the three ambition categories. Table 2 summarizes some of these differences. Through these numbers and percentages, more insight can be gained into which performance gains were intended and achieved, and to what degree.

Table 2. Ambitions and reengineering success

<i>Operational improvements</i>	<b>Low ambitions</b>		<b>Medium ambitions</b>		<b>High ambitions</b>	
	<i>intended</i>	<i>realized</i>	<i>intended</i>	<i>realized</i>	<i>intended</i>	<i>realized</i>
<b>Average number of improvements</b>	2.7	2.1	5.7	5.0	7.5	6.7
<b>Average height of improvements:</b>						
a) reduction of cost	21.67 %	18.75 %	13.00 %	12.40 %	31.25 %	22.75 %
b) cycle time	48.75 %	63.33 %	10.00 %	10.00 %	51.38 %	57.50 %
c) lead time	-	-	-	10.00 %	36.00 %	53.00 %
d) delivery reliability	-	-	10.33 %	7.00 %	50.00 %	42.20 %
e) price/performance ratio	25.00 %	-	15.00 %	8.00 %	105.00 %	40.33 %
f) productivity	15.00 %	30.00 %	10.00 %	7.00 %	78.75 %	123.00 %
g) time to market	-	-	20.00 %	18.00 %	35.00 %	38.00 %
h) market share	-	-	6.00 %	6.00 %	11.67 %	9.67 %
i) customer satisfaction	-	-	21.67 %	19.50 %	26.25 %	23.60 %
j) information services	-	-	33.33 %	25.00 %	61.25 %	58.75 %

With respect to the average number of intended improvements, organizations with low, medium and high ambitions reported 2.7, 5.7 and 7.5 improvements respectively. On average, they realized 2.1, 5.0 and 6.7 performance gains. Most organizations pursued and achieved a mixture of financial and non-financial improvements. The most popular intended improvements were reduction of cycle time, improvement of customer satisfaction, and reduction of costs: respectively 75%, 70% and 69% of the change efforts included these intentions (whether quantified or not quantified). The relatively high number of improvements reported on customer satisfaction reflects the fact that the majority of organizations initiated reengineering with an outward focus. To be more specific, the higher the ambitions, the more customer satisfaction improvement was intended and achieved. Breakpoints were pursued by 16 organizations (two in the low ambition group, and seven in the medium and high ambition groups). As to the realized performance gains, the same three indicators were mentioned in the top three: reduction of cycle time, reduction of costs and improvement of customer satisfaction were reported by respectively 66%, 66% and 54% of the respondents (whether quantified or not quantified). The figures indicate that improving customer satisfaction is a more difficult task for organizations than cutting costs or reducing cycle times, since there is a relatively large gap between ambition and achievement (70% versus 54%).

Furthermore, only about 50% of the realized performance improvements were quantified. The same applies to the intended performance gains. It would seem that the message stressed in reengineering literature [7, 15, 33, 38], that organizations should quantify aspirations and benefits, has not reached many organizations. Since explicit expectations and goals can support the realization of benefits, it can be stated that these organizations have not made the most of their opportunities. Finally, in agreement with past studies [14, 31], reengineering success increases with the level of ambition. In general, the highest performance gains were achieved by the most ambitious organizations (see table 2). However, only a minority of the organizations studied matched the achievements made in the spectacular cases mentioned in the literature [15, 37, 39]. This calls into question the relationship between reengineering and dramatic performance improvements.

### **Breadth, Depth, Planning, Co-ordination and Success**

To add insight to the foregoing general conclusion derived from figure 4, we must analyze the four dimensions underlying the concept of fit to find out if and how breadth, depth, planning and co-ordination are correlated to reengineering success. First, *breadth* appears to be neither strongly nor significantly related to reengineering success (Spearman correlation coefficient of 0.2526 with  $p > 0.05$ ). Thus we were not able to prove that reengineering success depends on the number of operational functions tackled in the change effort. This finding contradicts past studies [31]. Further research is

needed to examine the impact of process definition and delineation on reengineering success [30]. Second, a strong and significant relationship between *depth* and reengineering success is found (Spearman correlation coefficient of 0.5789 with  $p < 0.01$ ). Clearly, this finding reveals and reaffirms the fundamental nature of highly ambitious reengineering initiatives which typically entail multidimensional and radical changes. It also supports the assumption that less ambitious reengineering should preferably be focused on the customer approach (if relatively low ambitions are pursued), as well as on process knowledge and performance measurement (if medium ambitions are the aim).

If we reflect on these findings relating to breadth and depth, we find that many reengineering initiatives are internally focused. Many change efforts are not directed towards critical activities at the customer interface, but are targeted at operational functions such as procurement and inbound logistics. Moreover, with regard to the five change levers distinguished in our study, many organizations are inclined towards structural and technological changes, whereas they neglect the other organizational aspects. These observations place the outward focus shown in the ambitions set in a different light: the aspiration to achieve a higher level of customer satisfaction is often not translated into matching design measures.

Third, our study reaffirms that the way the change effort is prepared and structured directly influences reengineering outcomes. The *planning* dimension is strongly and significantly related to reengineering success (Spearman correlation coefficient of 0.4986 with  $p < 0.01$ ). Therefore higher benefits accrue if sufficient and appropriate planning measures are taken to guide the change effort. For example, with respect to leadership, the findings support previous research in that active senior management leadership is crucial in major reengineering initiatives [14, 30, 31]. However, this study also demonstrates that top management's ongoing involvement is misplaced in less ambitious reengineering efforts as it increases senior management's tendency to micro-manage the change process instead of focusing on strategic objectives. Likewise, carefully aligning projects into a program and formally assigning people to project teams and steering committees is critical to success if large-scale change processes have to be managed. On the other hand, such measures are rather overdone or even harmful in less ambitious change efforts.

Fourth, the way the change effort is *co-ordinated* strongly and significantly affects reengineering success (Spearman correlation coefficient of 0.4620 with  $p < 0.01$ ). This finding demonstrates that the extent and nature of co-ordination activities are related to reengineering outcomes. For instance, in highly ambitious change efforts there is a pressing need for periodical reviews between project and program leaders. Not addressing this need will be detrimental to the process of change. In less ambitious efforts, there is no need for such extensive co-ordination since relatively autonomous projects are defined.

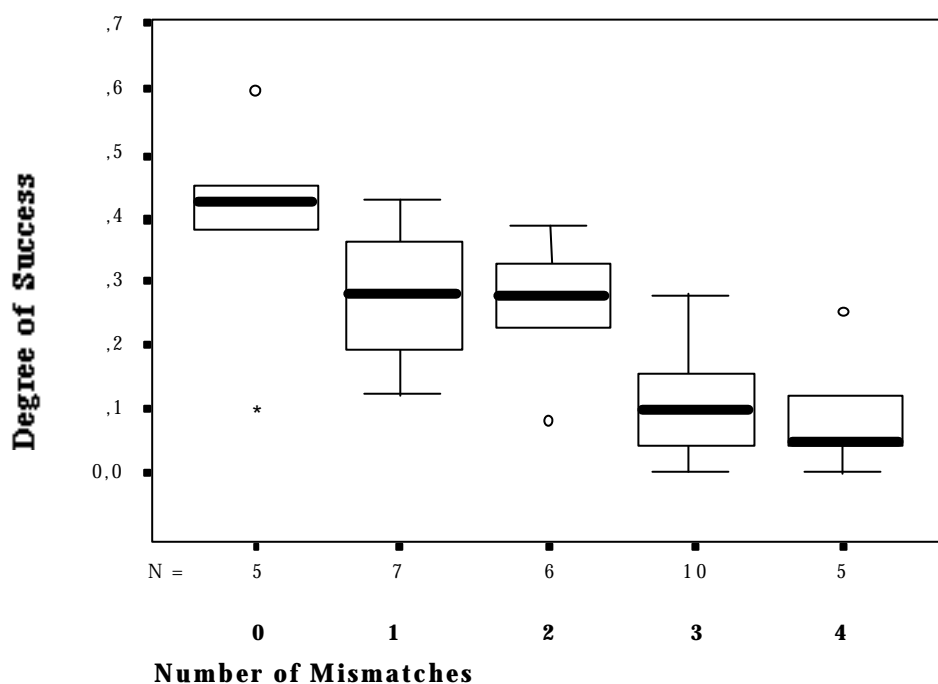
Hence, decisions with regard to planning and co-ordination of the change process need to be balanced;

otherwise they can easily undermine the reengineering effort. In fact, many organizations actually do undermine their own change endeavours by either underestimating or overestimating the change management measures required. Necessary decisions, such as reducing the number of projects to leverage on the existing change resources and assigning line managers with appropriate authority to direct the changes, often fail to take place or are postponed until the change process stagnates.

### The Number of Misfits

Finally, we ranked the 33 organizations according to the number of misfits they faced in their reengineering initiatives. This number reflects the distance between the actual pattern followed and the ideal-type pattern that corresponds to the level of ambition set. If no mismatches emerged in the change process, the organization changed according to an ideal-type pattern. If four misfits are shown, the distance between the actual pattern and the archetype is maximal.

Figure 5. Distance from ideal-type patterns and success



As indicated in figure 5, an increasing number of misfits results in a decreasing reengineering success. The magnitude of this correlation is the highest of all relationships discussed in this paper (Spearman correlation coefficient of -0.6819 with  $p < 0.01$ ). Clearly, the more the actual pattern deviates from the ideal-type pattern, i.e. the larger the distance between both patterns, the more the synergistic benefits of designing and implementing balanced change will be lost. This finding answers our second research

question. Reengineering outcomes generally depend on the distance between the actual pattern and the ideal-type pattern of change.

To conclude, given the strong and significant relationships revealed by our study (summarized in table 3), we can not reject the hypothesis. Although the number of organizations matching the three archetypes is small, which limits the generalizability of our findings, in this study fit nevertheless seems to be an essential factor explaining reengineering success and, therefore, organizational performance.

*Table 3. Findings*

<b>Relationship with reengineering succes</b>	<b>Spearman Correlation coefficient</b>	<b>Level of significance</b>
1. Fit	0.4352	p < 0.01
2. Breadth	0.2526	p > 0.05
3. Depth	0.5789	p < 0.01
4. Planning	0.4986	p < 0.01
5. Coordination	0.4620	p < 0.01
6. Number of misfits	-0.6819	p < 0.01

## **Managerial Implications and Conclusion**

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A number of practical implications can be derived from our study to support managers in balancing and rebalancing their change efforts. Explicitly managing fit implies that:

- 1 An appropriate level of ambition is determined. The necessity to change, i.e. the need for performance improvements, increases with the extent of the strategic gap with the environment. Subsequently, this need has to be balanced with the organization's ability to change and the risks involved in changing the organization [4]. Because it is the purpose of reengineering to achieve improvements that are clearly recognizable in the market or the environment in which the organization operates, the objectives set should have an outward focus [34, 39]. Delivering value to the customer should be the focal point of attention for managers. Besides selecting financial and non-financial indicators, performance indicators have to be quantified in order to motivate and mobilize the organization [7, 16, 42]. The resulting set of clear, competitive metrics will focus the organization on the highlighted areas of expected gains, and will guide the decisions with respect to the design and change management measures required to achieve the level of ambition.

2 The level of ambition set is ideally translated into a logical and harmonious package of design and change management measures. Manipulations of these measures have to bring about the right 'mind set' for implementing the desired changes throughout the organization. With regard to the design measures, it can be stated that the higher the level of ambition, the larger the number of critical activities or operational functions which need to be tackled, and the more organizational aspects have to be changed radically, ultimately leading to the redesign of the entire business system [19, 31, 34]. A high level of ambition should lead to the incorporation of all critical activities and to a radical redesign of all organizational aspects [8, 31]. With relatively low or medium ambitions, organizations can limit their change effort to fewer operational functions. Moreover, fewer organizational aspects then have to be changed radically. If organizations opt for less ambitious change processes, they should preferably focus their attention on those operational functions that are closest to the customer, and on radically changing the customer approach, process knowledge, and the performance measurement system. With respect to the change management measures, it is important to formally assign change managers with enough authority to direct the changes, to define a manageable set of clearly specified projects, and to facilitate effective communication among change managers and with those directly affected by the changes. The higher the level of ambition, the more pressing the need for senior management involvement and the alignment of projects into an integrated change program in order to keep the change effort focused and to leverage on the ever-scarce change resources available [6, 35, 45].

To conclude, our study demonstrates that fit is indeed a vital factor in explaining organizational performance. The notion of fit was also acknowledged by 90% of our respondents, who stated that management by matching was the critical success factor in business reengineering. However, the majority of the organizations (85%) showed a non-ideal-type pattern of change, implying that fit is not easily achieved in reengineering practice. Fit should therefore be managed explicitly. 'Management by matching' means that decisions with respect to level of ambition, breadth, depth, planning and co-ordination of the change process are made in conjunction with one another so that the whole package is given, and maintains, a logical integrity. The distinguished dimensions of organizational change have to be balanced and, if mismatches emerge, rebalanced. Since such mismatches readily occur, achieving fit is a fragile process that needs constant care. In this regard, the three archetypes presented in this paper may prove to be helpful concepts for change managers.

## **Directions for Future Research**

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Our study represents a step toward the improved understanding of the complex interactions between fit and organizational performance. However, it should be noted that the archetypes in the framework employed are in need of both theoretical and empirical elaboration. By incorporating more reengineering initiatives into our data set of 33 organizations, results with more generalizability can be generated. Besides, other researchers are encouraged to further develop theory and research on reengineering within the archetype approach, i.e. to explore general patterns of change rather than to strive for the identification of individual success factors. To elaborate on this line of enquiry, a variety of quantitative and qualitative assessments of reengineering initiatives will prove useful. Clearly, much work remains to be done in order to improve the robustness of the dimensions of organizational change and reengineering success and their operationalization into measurable constructs. Finally, future research on reengineering may include other dimensions. It would be particularly interesting to examine whether the chosen level of ambitions actually fits the requirements imposed by the environment of the organization, since organizations should not only pursue internal consistency, but also external congruence, in order to reach a higher level of performance.

## **NOTES**

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- 1) If they saw fit to do so, respondents were invited to add other indicators to this set of benefit categories. At their specification, quality improvement, culture change and 'others' were added.
- 2) This procedure resulted in three groups consisting of 10, 12 and 11 organizations respectively. The reason for this 'skewedness' was that at the line of demarcation between the low and medium level of ambition, two organizations had exactly the same ambition score. Both organizations were arbitrarily allocated to the medium level of ambition group.
- 3) The definitions mentioned in figure 1 were slightly relaxed because the differences in the ambition scores of the organizations located near the lines that demarcate the ambition groups are small. In other words, the highest ambition scores in a lower ambition group do not differ greatly from the lowest ambition scores in the higher ambition group. For breadth this means that organizations falling into the low and high ambition groups were allowed to redesign, respectively, two (instead of only one) and four (instead of at least five) critical activities. For depth, a match of four out of five organizational aspects still yielded a consistent mini-pattern. With regard to planning and co-ordination, one misfit in the constituent elements of the mini-patterns was overlooked, i.e. four out of five and two out of three elements (respectively) had to match the ideal-type pattern.

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## APPENDIX: Questionnaire: Selected Questions

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The original questionnaire consisted of 16 pages in Dutch. The complete list of questions can be found in Bouman et al. (1995). An outline indicating the main clusters of questions is given below.

### A Level of Ambition

1.1 Indicate on the following set of indicators which performance improvements were intended. If possible, quantify these intended improvements with a percentage.

	Intended	Quantified (%)
Cost	...	...
Cycle time (etc.)	...	...

1.2 Did your business unit strive for a 'breakpoint', i.e. a competitive advantage?

### B Reengineering success

2.1 Indicate on the following set of indicators which performance improvements were achieved. If possible, quantify these achieved improvements with a percentage.

	Achieved	Quantified (%)
Cost	...	...
Cycle time (etc.)	...	...

### C Breadth

3.1 Indicate which operational functions have been redesigned during the reengineering effort.

0 Inbound logistics 0 Procurement 0 Production 0 Outbound logistics 0 Marketing & Sales 0 Service

### D Depth

4.1 To what extent were the following design options applied?

	Strongly decreased	Decreased	Not used	Increased	Strongly increased
<b>Organizational structure</b>					
Number of hierarchical layers	...	...	...	...	...
Decentralization (etc.)	...	...	...	...	...
<b>Process knowledge</b>					
Use of activity-based costing	...	...	...	...	...
Knowledge of cycle time (etc.)	...	...	...	...	...
<b>Information technology</b>					
Number of shared databases	...	...	...	...	...
Workflow management systems (etc.)	...	...	...	...	...

Customer approach

Frequency of customer needs research	...	...	...	...	...	...
Segmentation into customer groups (etc.)	...	...	...	...	...	...

Performance measurement

Use of non-financial indicators by management	...	...	...	...	...
Use of financial indicators by work force (etc.)	...	...	...	...	...

E. Planning

5.1 How was the reengineering initiative structured?

One project  Multiple projects  One integrated change program

5.2 To what degree was the reengineering initiative specified?

We used a  detailed, short-term project plan  several midrange project plans  an indicative program plan  Other

5.3 What methods and tools were used during the reengineering effort?

SWOT analysis  Customer research  Competitive analysis  Process modelling  Risk analysis  Prototyping

Process analysis  Simulation  Feasibility study  Repositories  Benchmarking  Project management tools

Pilot studies  Analysis of core competences  Milestone planning  Other

5.4 Was the reengineering initiative carried out using a temporary governance structure?

No, we used the existing governance structure  Yes, we used a formalized project organisation structure

The formally assigned key roles were:  Project members  Project leader(s)  Program leader  Steering committee

5.5 What was the role of senior management?

Not involved in the initiative  Supported the initiative  Active ongoing leadership

F. Co-ordination

6.1 Did periodical change reviews of the reengineering initiative take place? If so, indicate who participated in these periodical reviews.

No  Project members and project leader  Various project leaders  Program leader and project leaders  Other

6.2 Were these meetings standardized by written progress reports?

No  Yes, we used high-level progress reports  Yes, we used detailed progress reports  Yes, we used both  Other

6.3 How was the initiative communicated to those directly affected by the changes?

People directly involved participated  Several information meetings were held to introduce and discuss the initiative

Formal information bulletins and memo's were used to announce the news about the initiative  Other