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Coevolutionary Approach for Implementing Organizational Change - Case Study on a Business Process Change in a Large Organization

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ABSTRACT

The objective of this research is to study *how to successfully implement organizational change in a large organization*. The study deals with an approach for implementation that incorporates both efficiency and flexibility. Within the domain of organizational change, this research focuses on business process change, more specifically the supply chain processes.

The research question is approached by first studying how to carry out implementation according to the relevant existing theories of organizational change. Then, a real life change implementation program is reflected with the existing implementation approaches and finally characteristics of a successful approach for change implementation are concluded. This study follows the logic of inductive theory building and qualitative case study. The research is designed as an embedded case study, the primary research object being an extensive change program that includes 24 individual implementation cases. The case data is mainly qualitative of nature and is collected through participant observation, archives and numerous and diverse documents created within the program.

The focal terms and the scope of the study are defined based on relevant theory of organizational change. For understanding the existing body of knowledge on change implementation, a multidisciplinary review is carried out including the theories of organization development, organization transformation, business process reengineering, project management and organizational learning. As a conclusion from the review, four research constructs are elaborated for guiding the case study. The constructs define essential elements of change implementation: initiation, management structure, process and change advancement. Using the elaborated constructs, two generic implementation approaches are conceptualised: planned and emergent. The former represents centrally managed, sequentially proceeding holistic change, whereas the latter is about locally managed, continuous and incremental implementation.

The case program is presented and analysed using the research constructs. The case provides evidence of an implementation approach that complies neither with the planned nor the emergent approach despite of many common elements. The findings show how change can be successfully implemented using a different approach, labelled as coevolutionary in this study. The coevolutionary approach is characterized by 1) initiation based on a challenge, 2) co-ordinated, but decentralized management structure, 3) dynamic process and 4) systemic change advancement. A challenge sets the performance level targeted by the change. The actual solutions for meeting the challenge develop during a dynamic implementation process through interaction between local and central instances involved in the implementation, advancing towards an overall solution. The coevolutionary approach provides a balance between the extremes of planned and emergent change and thus incorporates the benefits of both scalability and flexibility, efficiency and innovativeness. Finally, the findings are linked with complexity theory to offer further explanation how change is most effective in systems that are neither too rigid nor too chaotic.

FOREWORD

This dissertation combines my interests in scientific research and the practical challenges of implementing change in an organization. The research case, a two-year supply chain process development program at Nokia, served as a perfect object for these interests. ExIMa (Executive School of Industrial Management) provided the settings for producing the dissertation as the end result of the learning process. For getting the dissertation completed, I want to thank several people who have contributed to this work.

My warmest thanks go to my supervisor Professor Eero Eloranta at HUT for his valuable advice and guidance. I feel that his approach of letting me discover the research path rather independently fitted well with my personal way of working. Yet, every feedback session we had together stimulated new thoughts and structured the existing ones, driving the dissertation towards completion. I also feel grateful to Doctor Jan Holmström and Professor Eila Järvenpää at HUT. Their input in essential areas of the study helped me both go forward as well as critically review and improve the earlier versions of the manuscript. Discussions with Doctor Jussi Heikkilä also strengthened specific areas of my dissertation.

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My parents I want to thank for bringing me up to value learning new things, critical thinking and the art of getting work completed; all very useful characteristics in completing a dissertation. My friends and relatives deserve my warmest thanks for not spoiling my free time by being too interested in the thesis, yet expressing their great encouragement and excitement. Finally, I thank my great love Harri.

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Tiina Tissari

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GLOSSARY OF TERMS

AM	Account Manager
BIRD	Breakthrough Inventory Rotation Days, the name of the change program used as a case in this research
BPR	Business Process Reengineering
BSC	Base Station Controller
BSS	Base Station Subsystem
BTS	Base Transceiver Station
CS	Customer Services
EMEA	Europe, Middle East and Africa
IM	Information Management
IT	Information Technology
IRD	Inventories Rotation Days
LC	Logistics Co-ordinator
LE	Logistics Expert
LM	Logistics Manager
LTL	Logistics Team Leader
OD	Organization Development
OT	Organization Transformation
NET	Nokia Networks
NMP	Nokia Mobile Phones
PM	Project Manager
RDC	Regional Distribution Centre
RM	Rollout Manager
TQM	Total Quality Management
VP	Vice President

1. INTRODUCTION

This chapter presents the background and motivation of this research followed by the explicit research questions.

1.1 Background

Managing and implementing change has undoubtedly become one of the most critical factors for successful management of business (e.g. Salminen, 2000; Jarrar and Aspinwall, 1999b; Buchanan and Boddy, 1992). Nowadays, companies must not only cope with accelerating pace of change, but be able to leverage benefits from it. Factors contributing to the success of change, or on the contrary hindering it, have been studied and documented in various research and consultancy reports. Consensus prevails that focus on issues like communication, employee empowerment and committed leadership are ways to enhance performance of organizational change implementation. Still, many of the efforts fail. Estimated 50%-70% of reengineering efforts do not succeed in producing the intended results (Hammer and Champy, 1993) and in less than one third of the US and British companies engaged in total quality management (TQM) programs tangible performance benefits were gained (Ashkenas et al. 1995).

The focus in many change initiatives, as well as in the theory, is primarily in creating and designing optimal solutions for new ways of doing business. Concerning the process of making the change real, the main emphasis lies on planning and leading the change process, whereas implementing the solutions in practice is often considered as a mechanistic task of executing the plans. As a result, a lot of effort and resources are spent on development work and planning, but the targets are seldom met. Problems emerge in the implementation phase when the developed methods, concepts and processes are brought in practice in real business environment and organization. These problems are often considered a failure of the whole initiative and as a consequence new development programs are started for replacing the existing ones. Reger et al. (1994) state that change is never easy and when change initiatives fail to show positive results, managers become frustrated and move on to the next idea. Instead, one could learn from the issues that come up and further develop the solutions and the implementation approach to better fit to the specific business environment and complex organizations.

Some theories of organizational change emphasize the political nature of change management (e.g. Buchanan and Boddy, 1992) as opposed to the rational considerations. These theories are cantered around the issue of change resistance: how to gain all organizational members'

commitment, support or at least acceptance for the change. Despite of the valuable contribution of the theories, the underlying assumption that change resistance is always negative and to be eliminated, can be questioned. To be provocative, one could state a question: how much businesses would have been harmed, if all the ideas of inappropriate organizational set-ups, inadequate process designs or information technology (IT) solutions could have been implemented without any change resistance? Based on my own experience on several change efforts, change resistance is not only a negative political issue, but may as well be rational. In a complex business environment, it is not justified to expect that all members fully comprehend both the big picture as well as all the details of the organization; what seems rational to the initiator of the change may seem completely illogical to someone else. Therefore, rather than aiming at eliminating the different viewpoints, they could be used for enhancing the solutions.

Change initiatives often aim at creating an organization that is flexible and responsive, where decision-making is close to employees and where continuous improvement and learning is fostered (e.g. Pollalis, 1996). Kanter et al. (1992) state that the current trend of organizations being adaptable to change and sensitive to environment is becoming a universal model for organizations, especially for large ones. These organizations are structured as relatively few levels of formal hierarchy and loose boundaries among functions and units, and they empower people to take action and be entrepreneurial. Considering change implementation as a mechanistic execution of plans and elimination of change resistance does not fit too well with this trend, which implies a paradox between the target state of many organizational change efforts and the means for getting there. The intent in this research is to contribute to solving this paradox of developing flexible organizations in an inflexible way. The objective of this study is to conclude an approach for successful implementation by studying complementary views to it; what are the important aspects of organizational change implementation. The commonly known success factors of organizational change, such as perceived need for change, employee involvement, strong leadership and progress control (e.g. Salminen, 2000; Kotter, 1996; Beer and Walton, 1987) provide a basis for the study. The aim is to further understand how to achieve the presence of these well-known success factors. The interest is especially on implementing change in a large organization involving multiple units that incorporate diversity due to differences in e.g. geographical locations, types of customers and products and services delivered. In this context, change implementation involves the challenge of duplicating similar change in various organizational units in an effective and efficient manner. Organizational change in a large corporation is studied using an example change program called BIRD

(Breakthrough Inventory Rotation Days), carried out in Nokia Networks 1999-2000. The BIRD program involved implementing a strategic change of supply chain business processes.

1.2 Research Questions

The objective of this research is to study how to successfully implement organizational change in a large organization. The study deals with an approach for implementation that incorporates both systematics and flexibility. Within the domain of organizational change, this research focuses on business process change, more specifically the supply chain processes. The main research question can be formulated as follows:

- *How to successfully implement organizational change?*

It can be further divided to the following sub-questions:

- *How to carry out implementation according to the existing theories of organizational change?*
- *What are the characteristics of a successful approach for implementing organizational change?*

The first sub-question is studied by reviewing the applicable models and concepts for change implementation presented in the relevant theories about organizational change. Then, a successful approach is elaborated and proposed by reflecting a real-life case with the existing body of knowledge.

2. RESEARCH METHODOLOGY

This chapter presents the research methodology applied in the study. To avoid confusion related to overlapping terms, such as research methods, research strategy (e.g. Yin, 1994), research approach (e.g. Kasanen et al. 1991) and research design (e.g. Easterby-Smith et al. 1991), in this study methodology is approached in three levels: 1) the underlying scientific paradigm, 2) the applied research approach that guides the research design and 3) the actual research design, defined by Yin (1994) as the actions for getting from the initial set of research questions to the set of conclusions and for ensuring that the data and methods used are suitable for answering the initial questions stated. The chapter ends with a definition of the quality criteria set for this study including the measures taken for fulfilling them.

2.1 Scientific Paradigm

The concept of scientific paradigm was introduced by Kuhn (1970), who argues that scientific work takes place within a specific framework or paradigm, which determines the key concepts and methods, research designs and significant problems to be studied. Thus, work within a specific paradigm cannot be understood or criticized from the premises of another. Guba and Lincoln (1994) define scientific paradigm as the basic belief system or worldview that guides the researcher, not only in choices of methods but also in ontologically and epistemologically fundamental ways. Ontology refers to the beliefs of the form and nature of reality, whereas epistemology to the relationship between the researcher and the objects of research. Paradigm also determines how the researcher creates new knowledge and thus guides in selecting methods that comply with the paradigm. The beliefs incorporated in a paradigm are basic in the sense that their ultimate truthfulness can not be established, but they must be accepted simply on faith, however well argued. (Guba and Lincoln, 1994).

Positivism

The traditional and dominant approach of natural sciences is referred to as the positivist paradigm. The essential assumptions according to positivism are that reality is external and objective and knowledge is significant only if it is based on observations of this external reality (Easterby-Smith et al. 1991). The ontology thus is realistic with the aim of producing context-free generalizations and cause-effect laws by discovering the “true” state of affairs. The epistemology emphasizes objectivity and thus considers influence between the researcher and

the research objects in either direction a threat of validity. (Guba and Lincoln, 1994; Alasuutari, 1994) The methodological implications of these basic beliefs involve independence between an observer and object, value-freedom, causality, hypothetico-deductive reasoning, operationalization, reductionism and generalization (Easterby-Smith et al. 1991; Guba and Lincoln, 1994).

According to positivism, the aim of science is prediction and control of natural phenomena. Positivism focuses on verifying and post positivism on falsifying a priori hypotheses through experiments. (Guba and Lincoln, 1994) Easterby-Smith et al. (1991) conclude the main strengths of the positivist paradigm and the associated quantitative methods as coverage of wide range of situations, fast and economical research and considerable relevance to policy decisions, particularly when statistics are aggregated from large samples. Concerning the drawbacks of positivism, Guba and Lincoln (1994) distinguish between the critiques internal and external to the paradigm. The internal critique refers to ignorance of context, exclusion of meaning and purpose of the human actors, inapplicability of general data to individual cases and exclusion of emergent findings. These internal weaknesses can be overcome by greater use of quantitative data, so more severe is the external criticism about the assumptions of science as free of theoretical frameworks and values, and the notion that instead of creating scientific findings through objective observation of the external reality, they are created through interaction between the researcher and the objects. (Guba and Lincoln, 1994) Easterby-Smith et al. (1991) claim that the methods related to positivist paradigm tend to be rather inflexible, artificial, ineffective in understanding processes or the significance that people attach to actions and not very helpful in generating theories.

Hermeneutics

As a reaction to the application of positivism to the social sciences, a new paradigm has arisen during the last half century. The paradigm stems from the view that the world and "reality" are not objective and exterior, but that they are socially constructed and given meaning by people (Husserl, 1956). Guba and Lincoln (1994) note that, except of positivism, the scientific paradigms are still in a formative stage, which is well visible in the terminology concerning the new paradigm. The alternative paradigm for positivism has been labelled as hermeneutics (Gummesson, 2000), critical theory and constructivism (Guba and Lincoln, 1994), interpretive research (Kasanen et al. 1991), phenomenology (Easterby-Smith et al. 1991; Taylor and Bogdan, 1984) with the associated variants such as interpretive sciences (Habermas, 1970). The

variants involve some differences in applications and the emphasis they place on the most inappropriate features of positivism (Easterby-Smith et al. 1991), but for the sake of clarity the alternative paradigm including all its variants is here labelled as hermeneutics.

Whereas positivism relies on quantitativeness, elimination of values from science and extensive coverage of data, hermeneutics accepts certain subjectivity (Kasanen et al. 1991). The aim of research differs from prediction and control emphasized in positivism to understanding and reconstructing of constructions initially held. The ontological basis is relativism, considering realities as apprehendable in the form of multiple intangible mental constructions, socially and experimentally based and local and specific in nature. Constructions are not in any absolute sense more or less true, but simply more or less informed and sophisticated. The epistemology is transactional and subjectivist, assuming that the researcher and the object are interactively linked so that findings are literally created as the investigation proceeds. The methodology concerns interpreting the constructions using conventional hermeneutical techniques. (Guba and Lincoln, 1994).

The strengths of the hermeneutic paradigm and associated qualitative methods are concluded by Easterby-Smith et al. (1991) as the ability to look at change processes over time, to understand people's meanings, to adjust to new issues and ideas as they emerge, and to contribute to the evolution of new theories. The methodology also provides a way to gather data that is seen as natural rather than artificial. The drawbacks involve the great deal of time and resources that data collection can take and the difficulty of analysis and interpretation of data. (Easterby-Smith et al. 1991) As well, problems related to subjectivity of the research, limited extent of evidence and thus the generalizability of the results are associated with the hermeneutic paradigm, as will be further discussed in chapter 2.2 in connection with the research approach.

Recognizing the paradigm underlying the research methodology is important as it informs and guides the actual research inquiry. But, although positivism is commonly associated with quantitative methods and hermeneutics with qualitative methods, both methods may be used appropriately with any research paradigm (Guba and Lincoln, 1994; Taylor and Bogdan, 1984). The distinction between the two paradigms may be very clear at the philosophical level, as Burrell and Morgan (1979) argue, but when it comes to the use of quantitative or qualitative methods and to the issue of research design, the distinction breaks down (Bulmer, 1988; Punch, 1986). Loyal to the hermeneutic paradigm, Guba and Lincoln (1994) note that also paradigms are human constructions and hence subject to human error.

The aim of this research is to understand *how* to implement change. The objective is to reach a level of understanding that goes beyond the managerial recipes, presented as check lists or model processes, which remain superficial to the reader with little reference to the context of change. Creating such profound understanding seems difficult without participating in a change effort, which implies interaction between the researcher and the phenomenon under study leading to certain level of subjectivity and interpretation. As well, despite of the vast body of knowledge concerning change management, there is relatively little knowledge of change implementation and it is somewhat ambiguous. Thus, to form and test explicit hypotheses of the phenomenon under research seems difficult. Quantitative operationalization of the concepts would inevitably restrict the possibilities to understand the manifold interrelations and complexities involved. Based on the above reasons, the *hermeneutic* paradigm is considered the most natural in this study. However, relying primarily on the hermeneutic paradigm does not mean complete ignorance of the positivist ideal. Consistent with Alasuutari (1994), this study - like all scientific research - is guided by the aim of logical argumentation and certain objectivity by relying on the evidence, i.e. data, instead of subjective preferences.

2.2 Research Approach

The selected scientific paradigm has implications to the research approach, but it does not simply determine it. The debate on research approach is culminated on the relationship between data and theory (Easterby-Smith et al. 1991). The classical distinction is made between inductive and deductive strategies, where the predominant deductive strategy starts from a theory that is considered to represent the truth and deduces it to a specific problem or field of application. Inductive strategy then starts from specific empirical findings that are generalized to induce new theory. (Olkkonen, 1993) This study follows the logic of inductive theory building, aiming at inducing a more generic theory by reflecting the evidence obtained from the research data with the existing body of knowledge. Research approach also determines the type of evidence looked for and the nature of the data to be used. Referring to the object of research, the aim may be to gain evidence representing a complete population, or alternatively the focus may be on fewer especially relevant cases (Stake, 1994). Collection and analysis of research data may either be quantitative or qualitative in nature. In addition to being *inductive*, the research approach applied in this study is *qualitative* and the one of a *case study*.

Research can as well be categorized based on its intended results: basic research aims merely at producing theoretical contribution, whereas applied research also involves solving practical

problems (Kasanen et al. 1991; Gummesson, 2000). Action research, as a distinctive form of case study, then is research that itself should lead to change. Classical action research starts from the idea that to understand something well, you should try changing it. (Easterby-Smith et al. 1991) The approach is based on a collaborative problem-solving relationship between the researcher and a client. Action research is developed from the work of Kurt Lewin and it involves a cyclical process of diagnosing a change situation or a problem, planning, gathering data, taking action and finding facts about the results of the action for planning and taking further action (Lewin, 1946). At its core, action research is a research approach that focuses on simultaneous action and research in a participative manner (Coghlan and Brannick, 2001).

This research shares many characteristics of action research (Gummesson, 2000): it is holistic, recognizes complexity, aims at understanding and implementing change and incorporates interactive and total involvement of the researcher. However, my role in the case program was not to consult or solve problems, but to focus on practical change execution. Despite of deep involvement in the change, this research was not about changing the implementation approach in the case program, but about inducing a generic implementation approach by observing and studying the case. Thus, this study can be considered to include elements of action research, but it is by no means the dominant research approach. Rather, this study can be characterized as applied science, as in addition to theoretical contribution through new understanding, it aims at providing means for better change implementation.

Research approach can be further characterized based on other dimensions. Complementing the work of Neilimo and Näsi (1980), Kasanen et al. (1991) present a typology of different research approaches in business economics. Figure 1 applies the typology that categorizes research to rational[1] or empirical and to descriptive or normative.

[1] The original term theoretical is here replaced with rational to avoid confusion, as all scientific research is theoretical.

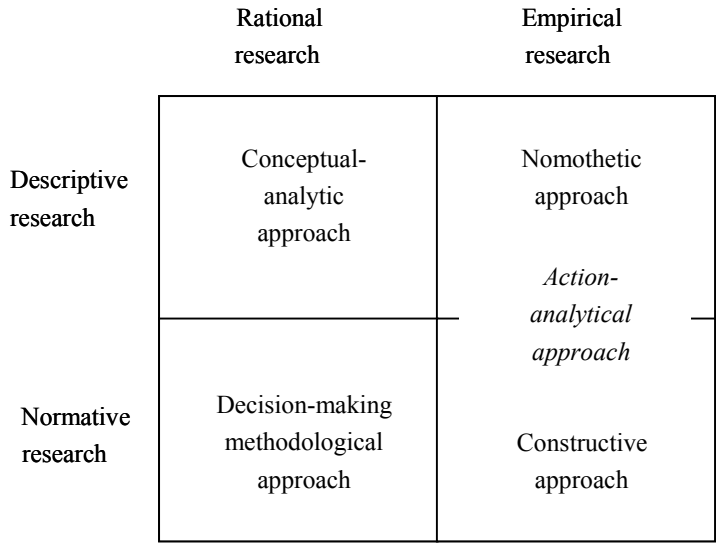


Figure 1. Research approaches in economics (adapted from Kasanen et al. 1991, p. 317).

According to the typology, the approach of this research is positioned as action-analytical, which is connected with the qualitative methods to understand and diagnose phenomena in their real-life context (Neilimo and Näsi, 1980). This research also shares characteristics with the constructive approach, as the intended end results can be considered an innovative construct derived from theory to solve a relevant practical problem (Kasanen et al. 1991). However, this study does not aim to test the construct by solving a specific practical problem, so it does not comply with all the essential features of constructive research.

As the further classifications do not have significant additional implications on the actual research design, this chapter focuses on the qualitative research and the case study approaches, especially inductive case study. The purpose is to provide reasoning for the selected research approach. Although it is possible to have both qualitative and quantitative features in case research (Stake, 1995; Eisenhardt, 1989a), qualitative inquiry dominates in them (Stake, 1994). Thus, the theory of qualitative and case study is somewhat overlapping, so common issues presented in connection with one of the approaches will not be repeated when describing the other.

2.2.1 Qualitative Research

Qualitative methods for gathering and making sense of data are closely associated with the hermeneutic paradigm (e.g. Guba and Lincoln, 1994; Taylor and Bogdan, 1984), as can be seen in Table 1 that presents the main characteristics. Bryman (1989) also notes that qualitative

research is not simply quantitative research without numbers, but it stands for a quite different set of beliefs about how organizations and their inhabitants ought to be studied. Qualitative researchers focus on understanding the complex interrelationships of a phenomenon and not on cause-effect relationship (Stake, 1995). Van Maanen (1983, p. 9) defines qualitative methods as "an array of interpretive techniques which seek to describe, decode, translate and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world".

Characteristics of Qualitative Research
• Emphasis on subject's interpretation through researcher being an insider in the organization • Notion that organization reality is something constructed and maintained by individuals rather than a prior entity that is independent of people • Emphasis on process, the unfolding and interconnections of events over time observed as they happen • Flexibility as the researcher is able to capitalize on chance remarks or unexpected events that propel a new line of investigation (not prescribed structure) • Emphasis on context • Close proximity to the phenomena under study, possibility to observe the flow of interaction at first hand and no layer between the researcher and the object

Table 1. Characteristics of qualitative research (adapted from Bryman, 1989).

In qualitative research, data is gathered informally beyond the formal occasions of data collection (Stake, 1995). Typically multiple methods of data collection are used, the most important ones being direct participant observation, interviews and documents (Stake, 1995; Bryman, 1989; Taylor and Bogdan, 1984). In addition, Yin (1994) mentions archival records and physical artefacts. Typically priority is placed on direct observation, as it best facilitates the understanding of a phenomenon (Stake, 1995; Yin, 1994). According to Bryman (1989) participant observation, also called field studies (e.g. Alasuutari, 1994), requires a fairly prolonged immersion of the researcher in the context that is to be studied. The purpose is to gain first-hand knowledge (Bryman, 1989). According to Yin (1994), participation allows unique opportunities for collecting data, as it may sometimes be the only way to have direct access to the phenomenon under investigation. Additionally, Bryman (1989) mentions unstructured interviews as useful means for obtaining multiple realities of a phenomenon and documents that may fulfil various functions in qualitative research: provide information on issues that cannot be readily addressed through other methods, check the validity of information deriving from other methods and contribute a different level of analysis from other methods (Bryman, 1989). Yet, Yin (1994) warns that documents are to be viewed critically, because they do not always present

and contain the absolute truth about the subject in concern, although a researcher may easily believe so.

The role of the participant researcher varies. He or she may or may not assume an employee role besides being a researcher, and the researcher role may be explicit or not (Easterby-Smith et al. 1991; Bryman, 1989). Bryman (1989) labels the different roles as 1) covert participation when the researcher is also an employee and no-one knows about the researcher role, 2) full participation when both the researcher and employee roles are explicit and 3) indirect observation when the researcher does not possess an employee role. Full and especially covert participation typically enable better access and eliminate the problem of the researcher affecting the normal flow of events, but covert participation may incorporate ethical dilemmas as well as crisis of identity (Bryman, 1989; Easterby-Smith et al. 1991). When making the choice of role, Easterby-Smith et al. (1991) advise to consider the purpose, cost and time available for the research, the possibilities to gain access and the extent to which the researcher would be comfortable in the role.

Bryman (1989) claims that all social research is subject to trade-offs. Even when researchers do their hardest to match the research problem with the method and design, it is rarely possible to avoid certain pitfalls or disadvantages in the choices made. The weaknesses of qualitative research involve problems in gaining access to the data as well as problems of analysing typically overwhelming amounts of data when trying to balance between openness to emergent themes and an explicit focus for organizing and conceptualizing the data. (Bryman, 1989) In this study, access of data did not constitute any problems, as the data collection was part of the researcher's normal work as an employee in the case program. Also in this study the collected data was extensive. But, the research constructs - developed based on the literature review and the experiences gathered during the fieldwork - restricted the selection of data that was systematically analysed. The researcher's role mainly as a covert participant and the exact data is presented in more detail in chapter 2.3.2.

Interpretation and subjectivity are an essential part of ensuring useful and reliable results in qualitative research, unlike in quantitative research where they typically reflect shortcomings (Stake, 1995). However, if subjectivity is falsely used, it can jeopardise the validity of the research outcome, which invites a consideration of how to make sure that interpreting organizational reality is correctly done. The means for overcoming the problem of false interpretation are concluded by Bryman (1989) as: close alignment of the researcher's and

subject's perspective through e.g. respondent validation, researcher's proximity with the subject and methodological triangulation by using multiple but independent methods. Stake (1995) concludes a good qualitative study to contain interpretations that are validated and to hold characteristics such as holistic, empirical, interpretive and empathic. Thick descriptions with researcher's interpretations, experiential understanding and multiple realities are prominent features of qualitative research, but despite of emphasis on subjectivity and common sense, there is definite need for discipline, guidelines, and protocols.

2.2.2 Case Study

Yin (1981a, 1981b) defines case study as an empirical inquiry that:

- Investigates a contemporary phenomenon within its real-life context; when
- The boundaries between phenomenon and context are not clearly evident; and in which
- Multiple sources of evidence are used.

A case is a specific and complex entity operating within a number of contexts. Holistic case study calls for examination of these complexities and for connecting ordinary practice in natural environments to the abstractions and concerns of academic disciplines. A case is unique in multiple ways, such as its nature, its historical background, the physical setting and other contexts including economic, political and legal. Each case study is a concentrated inquiry into a single case, although ultimately more interest may fall on a phenomenon or a population of cases than in the individual case. (Stake, 1994)

According to Yin (1994), the applicability of case study depends on the type of research question, the extent of control over behavioural events and the degree of focus on contemporary as opposed to historical events. Case studies are the preferred way when "how" or "why" questions are asked, when the relevant behaviours cannot be manipulated, and when the focus is on a contemporary phenomenon with some real-life context. Eisenhardt (1989a) suggests case study approach for understanding the dynamics present within single settings. Case studies have a special role in evaluation research, because they 1) can explain the causal links in real life interventions that are too complex for being analysed e.g. by surveys or experimental strategies, 2) describe a real life situation and 3) contain illustrative and descriptive parts, which may help the evaluation (Yin, 1994).

The case approach can be used to accomplish various aims: to provide description and test or generate theory. The final product may be concepts, a conceptual framework, propositions or

mid-range theory. Case studies are especially applicable in the early stages of research on a topic or for providing freshness in perspective to an already researched topic; when little is known about the phenomenon, current perspectives seem inadequate with little empirical substantiation or conflict with each other or common sense. (Eisenhardt, 1989a) The aim of this research is precisely to extend the apparently ambiguous theory of change implementation by studying a real life change implementation and explaining the complex interconnections involved. The case study approach thus seems well applicable for achieving deep understanding on the various aspects of change implementation in the context of large and multi-unit organization, without a possibility to control the events.

A case study may involve either single or multiple cases and numerous levels of analysis. The strength of a multiple case study is that it allows replication, i.e. verification and comparison across several cases, which potentially increases the validity of the research. On the other hand, single case design is justified if it is likely that the case meets the conditions to confirm, challenge or extend extant theory. A single case that represents significant contribution to knowledge and theory building is called critical case. Other reasons for a single case design are that the case represents an extreme and unique case or a revelatory case, referring to a unique access opportunity. Moreover, case studies can employ an embedded design that contains multiple levels of analysis within a single study. (Yin, 1994) Stake (1995) makes a difference between intrinsic and instrumental case studies, the intrinsic emphasizing understanding of a particular case as such. Instrumental case study then is used as a means for answering a research question, solving a general problem or building theory. Stake (1994) also assures that selecting cases for the study should not be based on representativeness of the whole population, but on maximizing learning from the specific case.

As this study aims at contributing to the generic theory of change implementation, it is instrumental of nature. Orlikowski and Hofman (1997) have recognized a discrepancy between how people think about change implementation and how they do it in practice. Thus, the only way to gain deep understanding on the dynamics of change implementation is through intimate connection with empirical reality, which makes it practically challenging to study an extensive number of change programs. In this study, the single case program provides the profundity looked for. Based on the experience from participating in the case program, it can also be presumed that the case program is both critical with its novel approach to change implementation and revelatory as I as the researcher have gained especially intimate access to the case through various employee roles in the case program. To further reveal the specific

issues related to change in a multi-unit organization and to increase the validity of the research, the single case embeds multiple smaller cases within it. In addition to the program as a whole, the customer specific local implementations (24) included in the program thus provide another level of analysis. The role of the multiple embedded cases in this research is to enhance the understanding of the program as a whole rather than being of interest as individual cases, which differentiates the embedded single case design applied in this study from a traditional multiple case study. For practical reasons, the embedded cases are however referred to as cases A-X further in this study.

Eisenhardt (1989a) considers analysing the data as the heart of a case study: within-case analysis for becoming intimately familiar with an individual case and cross-case analysis for looking at data in divergent ways if multiple cases. Stake (1995) calls the different ways of analysis as direct interpretation of the individual instance and aggregation of instances within a single case or across cases. Three basic ways of analysing qualitative and case data have been introduced: content analysis (Easterby-Smith et al. 1991), pattern matching (Yin, 1994) and "grounded theory" introduced by Glaser and Strauss (1967) and labelled as explanation building by Yin (1994). Content analysis emphasizes frequency and codification of data and thus bases more on the positivist tradition (Easterby-Smith et al. 1991). So does also pattern matching, which means comparing an empirically based pattern with a predicted one and, if multiple cases, replication across cases until the patterns coincide (Yin 1994).

The fundamental difference in grounded theory is that the final explanation may not be fully stipulated before data collection and analysis the data, but tentative propositions are revised during the study (Yin, 1994). The grounded theory is a methodology for inductive theory building that is grounded in systematically gathered and analysed data. Theory may be generated initially from the data, or elaborated from existing theories as incoming data is carefully played against them. In any case, the theory evolves during actual research through continuous interplay between analysis and data collection. The verification of the resulting statements of relationships between concepts is done throughout the course of a research project, rather than through following quantitative methods. (Glaser and Strauss, 1967; Strauss and Corbin, 1994; see also Eisenhardt, 1989a and Yin, 1994) In this study, there are no predefined patterns for verification and replication in the cases, but rather only tentative constructs that are to be used for focusing the interplay between the practical evidence and theory. Grounded theory thus most closely resembles the method of analysing data in this study.

Eisenhardt (1989a) concludes the strengths of theory building from cases as 1) likelihood of generating novel theory as creative insight often arises from the juxtaposition of contradictory or paradoxical evidence, 2) theory with less researcher bias than theory built from incremental studies or arm-chair, axiomatic deduction and 3) theory that is likely to be empirically valid. The weaknesses then account for the risks that the theory describes a very idiosyncratic phenomenon or that the researcher is unable to raise the level of generality. Kasanen et al. (1991) also note that when using limited data, the problem from the positivistic point of view is generalizability. Thus, although the importance of generalization in all research has been questioned (Feagin, Orum and Sjoberg, 1991), in instrumental case study it cannot be completely ignored.

Yin (1994) introduces two alternative ways of generalizing: statistical and analytical. Case study is not sampling research (Yin, 1994; Stake, 1994), so analytical generalization is commonly used and generalization is formed already in the phase of theory development (Yin, 1994). As a means for analytical generalization, Yin (1994) proposes replication across multiple cases that may be either literal or theoretical, the former predicting similar results and the latter producing contrasting results for predictable reasons. Also Eisenhardt (1989a) suggests that convincing empirical grounding often requires several cases or an embedded case with several mini-cases. She also advises to compare the emergent concepts, theory, or hypotheses with the extant literature: what is this similar to and what does it contradict with. Enfolding literature enhances the internal validity, generalizability, and the theoretical level of the case study research as the findings often rest on a very limited number of cases. On the other hand, Alasuutari (1994) claims that if all readers of a study can recognize the phenomenon and relate it to their own situation, there is no need for actual generalization of the results. As well Stake (1994) argues that readers learn more from the case description directly than from designed comparisons between cases. He also notes that despite of the drawbacks in creating generalizable grand theories, case studies serve establishing limits to existing generalizations and thus refining theory and suggesting complexities for further investigation.

As this study involves an embedded design, replication in the lower level of analysis, i.e. local implementation, is possible and will be used to enhance generalizability. Mainly, the replication will be literal of nature, as the aim is not to explicitly compare the individual implementations with each other. The whole program as the main unit of analysis is however a single case, so generalization in the program level is done using enfolding literature. As well, the aim is to provide a rigorous case description for the reader to make his or her own conclusions about the applicability of the research results. For ensuring the quality of case study research, Yin (1994)

proposes the following means: multiple sources of evidence, a case study database and a chain of evidence referring to explicit links between the questions asked, the data collected and the conclusions drawn. Eisenhardt (1989a) concludes good theory built from a case study as novel, testable and empirically valid.

2.3 Research Design of This Study

Based on the guidelines provided by the selected scientific paradigm and especially the research approach, this chapter describes the actual execution of this research.

2.3.1 Research Process

In the area of organizational change, the research issue of this study evolved from a more content-specific topic to the issue of implementation. Data collection took place during the case program as part of the normal program documentation. During that time the specific research questions and constructs were still unclear, so there was not yet perfect understanding what data exactly would be needed. Thus, no data specific to the research was collected in addition to the generic program documentation. Thanks to the relatively extensive and highly relevant documentation in the case program, the data proved sufficient when the research questions and constructs started to become shaped. The open research settings during the case program also eliminated the problems related to the researcher's role: effect of the research on the normal course of events and the ethics related to covert participation.

A literature review took place mainly after the case program had been finished, and as a result of the review and the experiences of the program, the research constructs for systematic data analysis were defined. As well, the research methodology decisions were finalized and formalized based on the research questions and the opportunities and restrictions provided by the data. Finally, the data were systematically analysed as directed by the research constructs. The constructs also guided the data selection; all the data available from the collection phase were not used.

Table 2 roughly presents the process applied in this study compared with the processes proposed in literature. Both Stake (1994) and Eisenhardt (1989a) have given their proposals for the case study process and Easterby-Smith et al. (1991) provide the researcher with a model process focusing at data analysis based on the grounded theory approach. The numbers in the model processes represent the original order proposed by the author, whereas in the process of this

research they naturally represent the chronological order of the phases, although iterative and highly overlapping. Additionally, the table includes the most relevant chapters in the thesis concerning each phase. An illustration of the research process in relation to the case program progress is presented in Appendix A.

Process in this study:	Corresponding phases in:		
	Process of data analysis according to the grounded theory (Easterby-Smith et al. 1991):	Responsibilities of qualitative case researcher (Stake, 1994):	Process of inducing theory using case studies (Eisenhardt, 1989a):
1 Case selection and research issue definition (spring 1999-spring 2000) *Chapter 1*		1) Conceptualize the object of study, i.e. the case 2) Select phenomena, themes or issues, i.e. research questions, to emphasize	1) Getting started: research question and possible a priori constructs 2) Selecting cases: theoretical sampling
2 Data collection (spring 1999-end 2000) *Chapters 2, 6*	1) Familiarization: read the data for emerging first thoughts		4) Entering the field: overlapping data collection and analysis
3 Literature review (autumn 2000-summer 2001) *Chapters 3, 4*			7) Enfolding literature: conflicting and similar literature
4 Conceptualization of research constructs (winter 2000-spring 2001) *Chapter 5*	2) Reflection: evaluate the data in the light of previous research, models and ideas and common sense explanations 3) Conceptualization: define set of concepts or variables that seem to be important for understanding what is going on		1) Getting started: research question and possible a priori constructs
5 Methodology formalization (winter 2000-spring 2001) *Chapter 2*			3) Crafting instruments and protocols: data collection methods
6 Systematic data analysis (spring-autumn 2001) *Chapters 2, 6*	4) Cataloguing concepts: reference concepts with data 5) Recording: refine concepts based on the data	3) Seek patterns of data to develop the issues 4) Triangulate key observations and bases for interpretation	5) Analyzing data: within- case and cross-case analyses 6) Shaping hypotheses: evidence for constructs, replication
7 Results (summer-autumn 2001) *Chapter 7*	6) Linking: connect variables into more holistic theory, empirical data with more general models	5) Develop assertions or generalizations about the case	7) Enfolding literature: conflicting and similar literature 8) Reaching closure: theoretical saturation
8 Evaluation (autumn 2001) *Chapter 8*	7) Re-evaluation: criticism and recognition of contradictions.		

Table 2. Process of this research compared with relevant generic processes.

2.3.2 Data and Its Collection

As advised by the authors of qualitative and case study approaches, multiple data sources were used also in this study to ensure the validity of the research. All the data, except the observations, have been stored in electrical format in a program database located in the case company.

Participant observation

The main data contributing to the understanding of the phenomenon was gathered through participant observation. I was involved in the case program as an employee in various different roles, both in the individual implementation level, referred to as cases A-X, as well as in the program management level overseeing all the implementations. This provided both local and global viewpoint to the issues. I started being involved in the program from its very beginning in January 1999 and continued until its end in December 2000. During the first two months I had no official role in the program, but I was preparing for the participating the implementations as soon as they would start. The different roles I assumed in the program are presented in Table 3.

Time	Role	Responsibilities	Notes
03-06/1999	Rollout expert and co-leader of pilot case C.	Facilitating the implementation in case C. Both project management tasks (planning, progress control, reporting, documentation) and content specific tasks (target process definition, IT system usage, interfacing with logistics partners and plants) collaboratively with the rollout manager. Also acted as the link to other pilots and program management.	During the time, I spent appr. 3 days per week in the respective country.
08/1999 - 01/2000	Rollout manager of case D.	Managing the overall implementation in case D, both as a project as well as the content of implemented solutions.	During the time, I spent on average appr. 1 day per week in the respective country.
09/1999 - 03/2000	Rollout manager of case I.	Managing the overall implementation in case I, both as a project as well as the content of implemented solutions.	During the time, I spent on average appr. 2 days per week in the respective country.
01/2000 - 12/2000	Program management team member / process expertise	Supporting implementation concerning the content of the target process: consult in defining the appropriate process, provide formal descriptions of the global target processes including guidelines for IT system usage, help in solving related problems, organize related training and communication for the implementation teams, provide feedback and learnings to other development efforts in the corporation.	Consultation was carried out mainly by meeting the rollout team members once or twice in the respective country in addition to the global meetings.

Table 3. Researcher's responsibilities in the case program.

Having participated in one of the pilots, I was also tightly involved in formalizing the process content and implementation approach for further implementations based on the pilots in summer and autumn 1999. My role in that work was to bring in the experiences of the actual implementation taking place locally. In addition, I participated in rollout team meetings, several workshops and preparation or kick-off meetings of other implementations. The tables containing other data sources used in the study include more specific information of the meetings, events and workshops that I observed as a participant in addition to analysing the related documentation.

Meeting Minutes

Minutes of meetings are used mainly for validating the observations and for providing detailed and specific data of the events. The minutes contain valuable information e.g. on decisions made, problems encountered and issues discussed among the program stakeholder. Concerning the steering group meetings, the minutes are the primary data source, as I was not part of the group and thus did not participate the meetings. Table 4 lists the meetings, the minutes of which are used as data in the research, including the title, time and topics of the meetings according to the minutes. Some terminology used in the table may be specific to the case and thus become completely clear only after reading the case description. My presence in the meetings is noted in connection with the time.

Title	Time	Topics
Steering group meetings		
Steering group meeting #1	8.1.1999	• Program induction and structure • Program steering • Pilot project plans, short term actions and critical success factors • Program communication
Steering group meeting #2	12.2.1999	• Status of action points • Status of account specific implementation • Status of general implementation • Demand planning • Status of pilot A • Status of pilot B
Steering group meeting #3	12.4.1999	• Status of action points • Program general status • Status of pilot A • Customer services related issues • Status of pilot B • The influence of program in strategy • Implementation plan • General implementation

Steering group meeting #4	3.5.1999	• Approval of the plan for BIRD implementation after pilots
Steering group meeting #5	10.6.1999	• Action point status • Status of contract review as part of general implementation • Status of pilots • BIRD implementation plans and resourcing needs, standard approach and supply chain processes
Steering group meeting #6	10.9.1999	• Action point status • Inventory situation • Customer Service's (CS) experiences from BIRD • Status of on-going implementations and issues confronted • Regional Distribution Centre (RDC) feasibility study results and decision on piloting • Plan to enhance delivery capability of one product line
(Steering group meeting #7)	10.12.1999	Minutes not available
Steering group meeting #8	1.3.2000	• Status of on-going implementations • CS strategy • RDC implementation and country warehouse closing plans • BIRD expansion to new areas and products
Global BIRD rollout team meetings		
Global BIRD rollout team meeting #1	19.8.1999 (present)	• Status of all on-going implementations • Standard implementation approach including the supportive tools • Communication tools in the program • Status reporting of the implementations to program management • Targets and plans related to logistics partners • Discussion on issues confronted in implementations
Global BIRD rollout team meeting #2	21.9.1999	• Status of all on-going implementations • Status reporting of the implementations to program management • Presentation of on-going case E • Learnings from case A • IT system support availability and issues experienced in implementations • Presentation of the metrics reporting
Global BIRD rollout team meeting #3	20.10.1999 (present)	• RDC principles • Status of all on-going implementations • Status of development of processes to be utilized in BIRD • Presentation of on-going case D • BIRD in year 2000 (description, scope, structure) • Results from first follow-up audits in customer projects already implemented
Global BIRD rollout team meeting #4	18.11.1999 (present)	• Feedback from strategy discussions to BIRD program • Metrics results of the on-going implementations • Measuring BIRD business impact

Global BIRD rollout team meeting #5	1.3.2000 (present)	• Tour in one product line • BIRD program overview (greetings from steering group, BIRD program expansion and country warehouse closing plan) • Status of RDC • Learnings from case G • BIRD rollout status and metrics • Handling of locally managed products in case I • Presentation of case P implementation
Other program level meetings		
Preparation meeting	10.12.1999	• Action points from the meeting • Ideas on standard processes: pull mode, co-ordination of deliveries, IT system related issues, delivery capability of a specific product line • Ideas on program organization: communications tools and materials, resources • Agreement of making an evaluation of the pilot countries A and B
BIRD pilot implementation planning meeting	13.1.1999	• Feedback from steering group meeting • Project management structure • Program and project targets • Customer service (CS) participation
BIRD deliver process acceptance meeting	21.-22.6.1999 (present)	• Overview of modular process approach • BIRD implementation concept, toolkit and plans • Overall development in supply chain area • Country buffer process (generic modular process and pilot case B) • Direct delivery process (generic modular process and pilot cases C and A) • Acceptance of generic country buffer and direct delivery processes • Plans for further development of the modular processes
Direct delivery implementation workshop	27.-28.1.2000 (present)	• Metrics • Drop-off point management • BIRD program organization and responsibilities • Logistics partner management • Generic direct delivery process • Demand planning process • IT system issues in BIRD process • Model implementation approach • Experiences in case D
RDC implementation workshop	14.-15.4.2000 (present)	• RDC operations • BIRD RDC achievements • Visit to RDC • RDC effects in the country • Preconditions for RDC mode • How to launch RDC concept to customer and project organization • Implementation specific action plans

Table 4. Meeting minutes used as data in this study.

Presentation Material

In addition to the meeting minutes, some presentation material is used as data. Most of the material was presented in meetings already mentioned in relation to the meeting minutes. Yet, concerning few meetings where minutes were not prepared, the presentation material is the primary data source. The presentation material data contributes most to process solutions, targets and objectives and the management structure of the program, as well as the plans related to the implementation approach. Table 5 lists the presentation material, presenter or creator and the time and occasion of the presentation.

Presentation material		
Topic	**Presenter / creator**	**Time and occasion**
BIRD program and project structure	Program manager	Steering group meeting 8.1.1999
BIRD program communication set (1st version)	Head of global supply chain development	Steering group meeting 8.1.1999
BIRD implementation plan and approach (version 0.3)	Program manager and program office manager	Steering group meeting 3.5.1999 and implementation approach workshop 7.5.1999 (present)
BIRD implementation concept for further implementations after pilots (version 1.0)	Program manager and program office manager	Steering group meeting 10.6.1999
BIRD program targets, plans and structure in year 2000	Program manager	Global BIRD rollout team meeting 20.10.1999 (present)
BIRD rollout status – inventory evolution	Program management team member, rollout operations	Steering group meeting 1.3.2000
BIRD rollout status – inventory evolution	Program management team member, rollout operations	Steering group meeting 23.5.2000
New model implementation approach	Member of rollout operations team	E-mail announcement in June 2000 (received)
New BIRD program structure	Program manager and management team member responsible for processes	E-mail announcement in July 2000 (received)
BIRD Program – status review including actions/decisions needed	Program manager	Meeting of the new, generic steering group 23.8.2000

Table 5. Presentation material used as data in this study.

Data on Individual Implementations

In addition to the data concerning the overall case program, numerous data specific to the local implementations, i.e. the embedded cases, is also used. The cases (24) represent all the implementations included in the program, except the ones that involved only minor process adjustments, as they were already operating almost according to the target processes as a result

from earlier development efforts (6) and the ones that could not be completed during the BIRD program, but were handed over to the operative organization for finalization mainly due to issues in the customer interface, such as on-going contractual negotiations or expected but unclear changes in the overall business situation (6). One local implementation is not included due to insufficient data.

A summary of all implementations, which was prepared in the end of the program by the program management team, is one of the data sources. An extract of the summary containing the relevant and non-confidential parts is presented in Appendix B. In addition, Table 6 illustrates other documentation per each implementation, referred to as a case, which was used as data. My participation in some preparation and kick-off meetings is indicated. The documents included in the table were typically produced by the leader of the local implementation, called rollout manager, or a rollout expert supporting the manager. In few cases, the program office manager, in later phase of the program called rollout operations manager, completed the documents based on the discussions with the local team. Unfortunately, not a complete set of documentation was made by all implementation teams. Generic content of Account Analysis, Project Plan, Process Description, Final Report and Project Summary are presented in Appendices C-G.

	Account Analysis	Project Plan	Process Description	Final Report	Project Summary	Minutes of preparation meeting	Minutes of kick-off meeting	Other documents
Case A	X	X	X	X	X	-	-	
Case B	-	X	X	X	X	-	-	
Case C	-	X	X	X	-	-	-	
Case D	X	X	X	X	X	X	X	X[1]
Case E	X	X	X	X	X	X	X	
Case F	X	X	-	-	-	X	X	X[2]
Case G	X	X	X	X	-	X	X	X[3]
Case H	X	X	X	-	X	X	X	
Case I	X	X	X	X	X	X	X	
Case J	X	X	X	-	-	-	X	
Case K	X	X	X	-	X	-	X	X[4]
Case L	X	-	X	-	-	-	-	
Case M	-	-	X	-	-	X	-	
Case N	X	X	X	X	-	-	-	
Case O	X	X	X	X	X	-	X	
Case P	X	X	X	-	-	-	-	
Case Q	X	X	X	X	X	X	X	
Case R	X	-	X	-	-	X	-	
Case S	-	X	X	-	-	-	-	
Case T	-	-	X	X	X	-	X	
Case U	X	X	X	-	X	-	X	X[5]
Case V	-	X	X	-	X	-	X	X[6]
Case W	-	-	X	X	X	-	X	
Case X	X	X	X	X	X	-	X	

: Indicates the researcher's participation in the meeting

1: E-mails received during the local implementation process, agenda for the BIRD kick-off meeting and minutes of meeting (4.10.1999) held with the customer concerning the BIRD process
2: Minutes of BIRD rollout status meeting (9.3.2000), contents: current status of BIRD rollout, status of CS project, description of the local site process, discussion on the implementation of BIRD principles within the CS rollout process and definition of future actions and timetable
3: Subproject summary (25.11.1999), minutes of RDC meeting (24.11.1999) and project meetings (23.11. and 6.12.1999, 4.1. and 15.2.2000), local BIRD bulletin (issues 1, 2), status reports (10.3., 10.4., 20.4., 5.5. and 26.6.2000)
4: RDC process description document, Minutes of BIRD planning meeting (17.5.2000), BIRD rollout status reports (7) 07/2000-12/2000, Minutes of closing meeting (1.2.2001)
5: Minutes of closing meeting
6: Presentation on the account status

Table 6. Documents used in this study concerning individual implementations.

Other Data

To evaluate the success of the BIRD program, archives containing the periodical inventory values and IRD are used. The data was retrieved from an IT system used for managing orders and deliveries in the account teams. The values used represent the operative inventory values without any financial corrections, as they better illustrate the supply chain performance. For cases A and C, the inventory values are retrieved from the financial system including the corrections, as in the beginning of the program the operative IT system did not yet support the reporting. For case B, the data is received manually from the local rollout manager. As well,

generic customer satisfaction surveys carried out yearly are used. An external party for Nokia through face-to-face interviews or via Internet carries out the surveys. The number of customer respondents varies from one to five persons, representing customer's top management in functions like operations, technical expertise, engineering and purchasing. The survey covers the overall relationship between the customer and Nokia: relationship, products and deliveries as examples.

In addition, some e-mails received during the program were used for checking individual details related to for example the people involved and the timing of events. Individual details related to the initiation of the local implementations were checked from the program office manager (later program manager) and the rollout manager of cases B, G, N and P when writing the thesis. Nokia annual reports 1998 and 2000 were used as data sources for introducing the case company.

2.3.3 Data Analysis

The research is designed as an embedded single case, so the units of analysis are the case program in the higher level and the individual implementations (24) in the lower level. For the sake of practicality, the former (higher level) is called program or BIRD and the latter (lower level) case or local implementation in this text. In the program level - the main unit of analysis - the analysis thus resembles a single case. In the embedded case level, the analysis differs from a traditional multiple case design as the aim is to create understanding on the single program through the embedded cases and not about the cases as individuals. A separate within-case analysis of the local implementations is thus not carried out for two reasons: 1) the importance of an individual local implementation is secondary and mainly needed for understanding the complexities of the implementation program as a whole, and 2) the amount of data related to each implementation multiplied with the number of implementations is so vast that presenting even a compressed analysis would be practically difficult. Thus, the analysis of data is built around the research constructs rather than individual cases and so it resembles one of the alternatives proposed by Yin (1994) where information of the individual embedded cases is scattered in different parts of the report according to a structure based on the issues under investigation.

The research constructs defined for this study ultimately stem from the data collection phase when I was employed in the case program. At that time, without systematically analysing each local implementation or the program as a whole, I familiarized myself more or less with each

case while participating the program. At the end of the program I started to make an extensive literature review that demonstrated two alternative theories of change implementation as a basis for the data analysis. Conceptualization and elaboration of the extant theory produced the research constructs. The constructs supported analysing the novelty of the implementation approach applied in the case program.

Applying the method of grounded theory means that there are no complete patterns to be verified and replicated by the cases, but the case itself is the means for developing the patterns through constant comparison between the data and theory. After defining the research constructs, I familiarized myself again with the case program data, especially with the ones that concerned events that I had not participated. Then, the systematic analysis was about finding out explicit indicators concerning each construct. The indicators concerned the program as a whole, individual implementations, the relations between the program and local implementations, or the relations between the local implementations. The evidence was gathered from any available source of data. The starting point in the systematic analysis thus was the structure based on the research constructs, to which the case data were reflected. So, characteristic in analysing the data of this research is that multiple indicators relate to a single construct measure, as Eisenhardt (1989a) also notes when presenting the process of inductive theory building.

To ensure the validity and reliability of the inferences, the attempt in the analysis is to link each indicator of a construct measure with an explicit data source. My own understanding gathered through participant observation is mainly utilized for finding out and selecting the indicators and their explicit evidence from the vast data, as well as discovering connections between individual and seemingly separate issues that are linked, for example through being indicators of the same construct. Figure 2 concludes the data analysis process of this study.

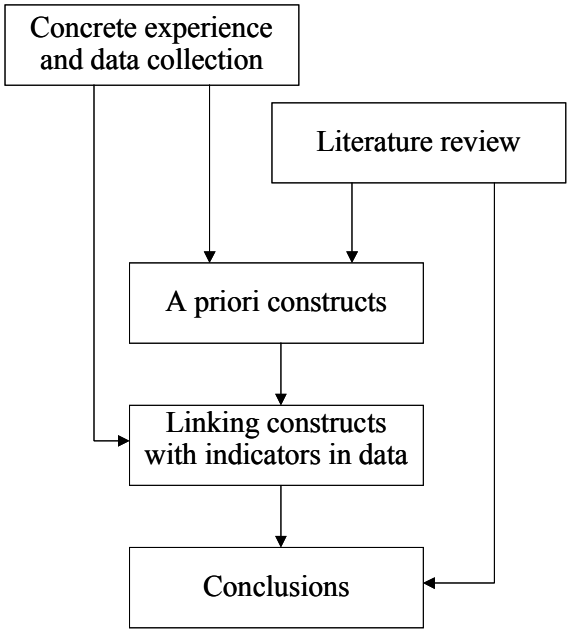


Figure 2. Data analysis in this study.

2.4 Quality Criteria of This Study

Widely used generic criteria for judging research design are reliability and validity. Validity consists of construct, internal and external validity. (e.g. Kidder and Judd, 1986) Description of the criteria and means for improving the quality are summarized as follows:

- Construct validity for establishing correct operational measures for the concepts to be studied (Kidder and Judd, 1986):
    - Establishing a chain of evidence between research questions, evidence and conclusions, and respondent review of draft case description (Yin, 1994)
    - Multiple sources of evidence (Yin, 1994; Eisenhardt, 1989a)
    - Definition of a priori constructs prior to data collection and analysis, iterative and constant comparison of theory and data (Eisenhardt, 1989a)
- Internal validity referring to establishing a causal relationship. This is relevant in explanative and causal studies, whereby certain conditions are shown to lead to other conditions. (Kidder and Judd, 1986) In case study, internal validity is to be considered more broadly as the correctness of inference based on evidence (Yin, 1994).
    - Pattern-matching, explanation-building and time-series analysis (Yin, 1994)
    - Comparison with conflicting literature (Eisenhardt, 1989a)
- External validity for establishing the domain to which a study's findings can be generalized (Kidder and Judd, 1986):

- Replication logic in multiple case-studies (Yin, 1994)
- Comparison with similar literature (Eisenhardt, 1989a)
- Thick description for the reader's own judgement (Stake, 1995; Alasuutari, 1994)

- Reliability demonstrating that the operations of a study, such as the data collection procedures, can be repeated with the same results (Kidder and Judd, 1986):
  - Use of case study protocol, case study database (Yin, 1994).

Based on the selected research strategy, the quality of this research is to be judged not only based on the generic criteria related to research design, but also based on the specific characteristics of qualitative and case study approaches. The relevant and most important criteria including the specific measures taken to ensure the quality of this research are summarized in Table 7.

Quality criteria	**Measures taken to ensure quality of this study**
Research design (Kidder and Judd, 1986)	
Construct validity	Respondent review of the case description by 3 members of the program organization. Use of multiple data sources and collection methods. Definition of research constructs to guide data collection and for linking theory, data, conclusions and research questions tightly.
Internal validity	Matching the data with the research constructs defined based on data collection of the case program through participation and existing theory. Comparison also with conflicting theory.
External validity	Multiple embedded cases inside the main unit of analysis. Analytical generalization by reflecting enfolding literature. Rigorous case description for reader's own judgement.
Reliability	Case database containing all data used in this study (documents, archives) in electrical format for verification.
Qualitative approach (Bryman, 1989; Stake, 1995)	
Validity of interpretations	See above the measures for ensuring validity
Close proximity to the phenomenon under study	Full-time participation in the case program for two years as an employee, not explicitly as a researcher
Flexible research structure	Entering the field with only the research issue in mind without hypotheses and theories
Multiple realities through holistic data	Different responsibilities and roles assumed in the program, multiple data sources and collection methods
Case study approach (Yin, 1994; Stake 1994 and 1995; Eisenhardt, 1989a)	
Validity of empirical data	See above the measures for ensuring validity
Understanding dynamics of single settings	Full-time participation in the case program for two years as an employee
Analytical generalization	See above the measures for ensuring external validity
Novelty of outcomes	Practical evidence reflected with ambiguous theories established based on extensive literature review

Table 7. Quality criteria and the measures taken to ensure the quality of this study.

3. DEFINITIONS AND SCOPE

In this chapter, the focal terms and concepts used in the study are defined. In addition, the scope of the study is restricted according to what type of organizational change it concerns. The scoping is done based on a presentation and summary of various theoretical categorizations of organizational change.

3.1 Definitions

For French and Bell (1999, p. 2) "change means the new state of things is different from the old state of things". Van de Ven and Poole (1995) define that change is an empirical observation of difference in form, quality, or state over time in an organizational entity or in the overall organization. Organizations then are social inventions designed to achieve economic or other purposes while at the same time fulfilling member needs. Organizations can be viewed as systemic entities as they consist of numerous subsystems like people, structures, processes, culture, procedures and practices, information systems and manufacturing systems. As well, organizations are dynamic as they change and adapt based on continuous interaction among the subsystems and with the environment. (Beer, 1980; see also Cleland and King, 1983) Building on the presented definitions, the term *organizational change* is defined in this study as:

> *Empirically observable change in one or more organizational sub-systems, such as people, structures, processes, culture, procedures and practices, information systems and manufacturing systems.*

The focus is especially on change in organizational activities instead of less tangible changes in mindset, values or competence. Organizational change in this study is not restricted to any specific discipline or theory concerning the phenomenon. Whereas Salminen (2000) makes a distinction between organizational and operational change, and relates the former merely to people related issues like roles and values and the latter to operational processes such as manufacturing, logistics and customer service processes, in this study operational change is included in organizational change. Accordingly, changes in business processes are a type of organizational change that involves the processes and the interrelated subsystems. In this study, a definition of a *business process* is adapted from Davenport and Short (1990) as:

> *A set of tasks performed to achieve a defined business outcome.*

The business processes under change in the case program of this study more specifically concern supply chain processes, for the sake of practicality also referred to as logistics processes or supply chains further in this thesis. The definition of the supply chain process as a type of business process is formulated as (adapted from Heikkilä, 2000; see also Christopher, 1998):

> *A process involving several organizational units working together to supply goods and services to meet the ultimate customer need.*

The broad definition of organizational change used in this study is based on the body of research that indicates how changes in the organizational subsystems are interconnected: applying new technology triggers changes in tasks and jobs, in the organization of work, in organization structures and in organizational mission and strategy (McLoughlin and Clark, 1989; Buchanan and Boddy, 1992; Safayeni et al. 1991). Therefore, as Buchanan and Boddy (1992) state it is unrealistic to identify operational or technical change and organizational change as separate and distinct phenomena.

Cummings and Huse (1985) describe organizational change as the transition state between the current and desired future states. This conventional modern idea of change dating back to Lewin (1947) typically assumes that change involves movement between some discrete and rather fixed “states”, so that organizational change is a matter of being in State 1 at Time 1 and State 2 at Time 2. Among many other authors, Kanter et al. (1992) consider this linear and static conception inappropriate, yet they admit that it offers a very straightforward way of planning change actions by simplifying an extraordinarily complex process.

Nadler and Tushman (1989) note that managing organizational change involves managing the "what" as well as the "how", the former concerning the content of the change - what strategies and elements of organization will have to be changed to enable the organization effectively to anticipate, respond to, and even shape the challenges to come. In this study, the *"what" interchangeably refers to the content of change or solutions*. The *"how" then concerns the process* of managing reorientations. Compared with Lewin's (1947) transition model, the content concerns the factual difference between states 1 and 2, whereas the process is the transition between the states. MacIntosh and MacLean (1999) note that research in strategy is also divided into content and process driven schools, the first representing the “what” in forms of competitive superiority through the reconfiguration of resources, competencies and linkages,

and the second approach focusing on the management processes which support strategic change and innovation.

In addition to the content and process of change, Pettigrew (1985) emphasizes the importance of the *context* of change (see also Dawson, 1994). He claims that formulating the content of any new strategy requires managing its context and process and thus strategic change should involve the interaction between ideas about the context, the process and the content of change. He considers that ahistorical, aprocessual and acontextual analyses of an individual organizational change project fail in providing insight to the form, meaning and substance of the change events. Such studies on organizational change are primarily concerned of the problematics of narrow changes rather than the holistic and dynamic analysis of changing. (Pettigrew et al., 1992) To further describe paradigmatic and radical change, labelled as second-order change by Levy (1986), he adds another aspect to organizational change as he approaches it from three perspectives: content, process and the driving forces determining *why* change occurs as illustrated in Figure 3.

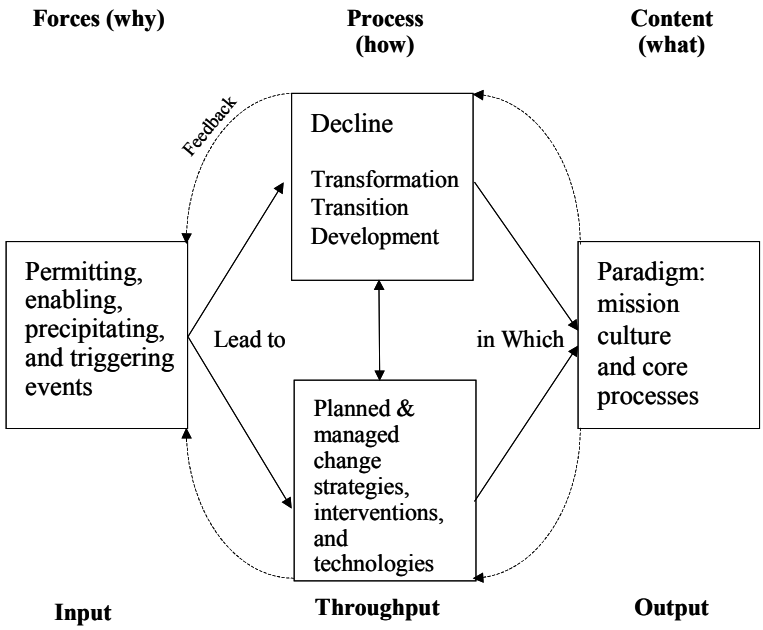


Figure 3. Model for understanding second-order change (Levy, 1986, p. 17).

Organizational change can as well be considered an innovation, as innovation has been defined as a technology, product or practice "being used for the first time by members of an organization, whether or not other organizations have used it previously" (Nord and Tucker, 1987, p. 6). Whereas Nord and Tucker (1987) include the use of an innovation as part of the

innovation itself, Klein and Sorra (1996, p. 1055) make a distinction between an innovation and its implementation, the latter defined as "the process of gaining targeted organizational members' appropriate and committed use of an innovation". In the context of IT change, implementation has also been defined as "ongoing process of preparing the organization for the new system and introducing it in such a way as to assure its successful use" (Davis and Olson, 1985). Analogous with the definition of Nadler and Tushman (1989), innovation may thus refer to the "what" and innovation implementation to the "how" of organizational change.

Based on the definitions of organizational change presented above, it can be concluded that the focus of this study is primarily on the process of change instead of concentrating on the solutions demonstrating the content of the change: optimal supply chain structure or organizational set-up. Defining a target for organizational change is also out of the scope in this study. Thus, despite of the importance of the topic, this study does not aim at answering questions like: when should an organization change, what should an organization be like after a change, what are the strategic objectives that should be set for organizational change? Thus, implementation is considered as a part of the change process that additionally can involve e.g. defining the objectives, designing the solutions and maintaining the change. However, focus on implementation will not mean total ignorance of the other elements of organizational change – purpose, content and context – but they will be considered when relevant in enabling deep understanding of the implementation. Building on Klein's and Sorra's (1996) definition of innovation implementation and Davis' and Olson's (1985) definition of IT implementation, *implementation of organizational change,* also referred simply to as implementation further in this text, is defined in this study as the process of:

> *Building conditions for appropriate use of new solutions and taking them in use to affect the organization.*

Thus, change implementation is considered as part of change management, a widely used generic term referring to systematic approach to planning, implementing and controlling organizational change.

Concerning the success of change, the ultimate purpose of organizational change in a business organization should be to create a better fit between the company and its environment, a more effective and efficient way of doing business. Salminen (2000) has defined success of a change effort in a manifold and comprehensive manner as being the degree to which it fulfils the

following criteria: 1) meets the goals set for it, 2) is implemented on schedule and within budget, 3) generates positive operational and economic results that in a reasonable time frame outweigh the costs of implementing the changes and 4) is perceived as successful by most internal and external stakeholders. Adapting Klein's and Sorra's (1996) theory of innovation implementation, the success of organizational change depends both on the quality of the solution and the effectiveness of the implementation, and implementation may result in one of the following three outcomes:

a) Implementation is effective, and the use of the innovation enhances the performance of organization
b) Implementation is effective, but organization's performance is not developed
c) Implementation fails.

According to this logic of Klein and Sorra (1996), successful implementation could result in overall negative change outcomes if the solutions are bad or inappropriate to the context, which emphasizes the independence between the content and process of change. This viewpoint is associated with the content driven school of strategic research where the premise of change is a predefined target state that is to be implemented (MacIntosh and MacLean, 1999). The success criteria 1) and 2) of complying with the goals, schedule and budget proposed by Salminen (2000) also aligns well with this viewpoint. However, as Salminen mentions himself, the problem is that the goals, schedule and budget may be ill defined and the implementation can meet or even exceed the goals set for it, but still fail to provide the company with better performance. In the worst case, implementing an effort all the way according to its original goals and plans may even decrease the performance. As Stace and Dunphy (1994) note, successful change interventions should promote the emergent strategy of the organization, which thus may not be constant, but dynamic.

As a contrast, according to the process driven school there is no clear plan or picture of the target state of the change to start with, but it is formed during the implementation. Whereas the content-driven school aims at improving the success of change with better solutions designed for implementation, the process driven school emphasizes facilitation of emergence (MacIntosh and MacLean, 1999). The fundamental difference seems to be whether implementation is considered as a mechanistic execution of plans to implement solutions once created, or whether implementation and the solutions are more intertwined and directed by the business impacts. If content and implementation are perceived as intertwined, the success of implementation should be determined by the positive impact of the change and not primarily by the compliance with the

plans. The success criteria 3) and 4) related to positive operational and economic results and the perceived success in Salminen's (2000) list relate to this alternative viewpoint. Consequently, successful implementation is not possible without successful overall change. In the case of ill-defined or inappropriate solutions, successful implementation requires replacing or improving the solutions or in the worst case even terminating the change.

Although implementation is identified as a distinctive element of organizational change as the primary focus of this study, it is considered closely interconnected with the content of change and the success of overall change. Whereas compliance with targets, schedule and budget are definitely appreciable if they contribute to positive change, in this study they are considered as secondary success criteria. It is assumed that even if a change implementation lasted twice the time scheduled, overran the budget and ended up implementing different solutions than planned, it may still be successful if it results in significant positive change. In this study, determining the success of implementation regardless of the overall change success is not considered meaningful and thus implementation is not regarded only as execution of plans, but also as the ability to assess and improve the solutions based on the implementation experience. Successful implementation of organizational change is defined - observing Salminen's (2000) notion to consider both effectiveness and efficiency of the change - in this study as:

> *Implementation, which improves organization's performance in a way that outweighs the time and resources used.*

This simpler definition also makes it less difficult to determine whether a specific change effort was successful or not, which Salminen (2000) considers challenging according to his manifold list of success criteria. However, demonstrating a cause-effect relationship even between an individual change effort and the overall economic performance of a company may be extremely difficult (French and Bell, 1999; Beer and Walton, 1987; Eccles and Nohria, 1992).

In the context of this study, the relevant indicators of the implementation success are based on the supply chain performance. Christopher (1998) states how supply chain management can contribute to competitive advantage through 1) value advantage and 2) productivity advantage. Langley and Holcomb (1994) refer to the same topics with the potential of enhanced service, increased customer satisfaction and reduced costs. Value advantage stems from tailored services, reliability and responsiveness (Chistopher, 1998) and the basic performance indicators include lead times, in stock availability and on-time delivery percentage (Sterling, 1994). The

productivity advantage then is for example about minimum direct costs, maximum capacity utilization and asset turnover. Concerning the supply chain costs of a high value technology product, the asset turnover makes up the dominant cost factor. Accounting researchers like Cooper and Kaplan (1991), Cryzewski (1991) and Campbell (1995) have also pointed out how the share of direct costs is continuously decreasing in industries overall. Sterling (1994) notes that concerning supply chain management, evaluating inventory should be viewed as one of the most opportunistic and rewarding activities when looking for an immediate payback or profit improvement as often more than 50 percent of a company's current assets are tied up in inventory (Christopher, 1998). This is especially valid in industries where technological innovation drives a rapid introduction of new products to the market and price erosion thus is a major problem causing risk for obsolete inventory. In the telecommunications industry the magnitude of price erosion has been in the range of 20 to 30 percent a year. (Hoover et al., 2001)

The concrete indicators to be used in this study for evaluating the organization's performance and hence the success of implementation are 1) *customer satisfaction,* 2) *lead time* referring to the value advantage through responsiveness and 3) *inventory value* referring to the productivity advantage. The indicators represent the most relevant aspects of supply chain management in the context of the study. As well, the selection is influenced by the availability of data so that for example on-time delivery is not measured, because comprehensive and reliable results are not available, especially from the time before the case program.

3.2 Types of Organizational Change

Organizational change can and has been classified in various ways. Van de Ven and Poole (1995) make a distinction of categorizing changes based on their *outcome* and the *process* and unlike most of the theories of organizational change, they concentrate on the process. The outcome of change refers to the theories of radical or discontinuous versus incremental or continuous change (e.g. Tushman et al., 1985). Mintzberg and Westley (1992) propose a framework of organizational change consisting of 1) contents and levels, 2) means and processes, 3) episodes and stages and 4) sequences and patterns of change, the first referring to the outcome and the second and third to the process of change. Sequence and patterns of change then classify the pattern how different changes follow each other, which is not limited to an individual change effort and thus beyond the scope of this study. In addition to the outcome and process of change, Nadler and Tushman (1989), present the position of the change in relation to

external events as a further dimension for classification, here referred to as *origin* of change. Thus, they make a distinction between anticipatory and reactive change. The three dimensions - origin, outcome and process of change - are used for further understanding the different characteristics of change and the scope of this study.

3.2.1 Origin of Change

Organizations may be objects of changes in the environment, such as the social change from industrialized to knowledge-based economies and from regulated domestic economies to internationally competitive environments (Stace and Dunphy, 1994). As well organizations can act as initiators and active participants of change. Thus, organizational change may concern *unintentional* changes that happen to an organization and its members, or it can be seen as *intentional* and deliberate actions of the organization itself (Kanter et al. 1992). However, also deliberate change may be triggered and affected by events that happen to the organization and even if change is considered deliberate by its initiators, others in the same organization may perceive it taking place without their influence (Kanter et al. 1992).

Nadler and Tushman (1989) present a classification of organizational change where one differentiating factor is how the change relates to the key external events. Changes that are initiated clearly in response to an event or series of events are called *reactive*, whereas the ones initiated in anticipation of external events are named *anticipatory* changes. The reactive changes occur in response to an immediate problem due to e.g. actions of a competitor, changes in market needs or new technology. On the contrary, anticipatory changes are not driven by a performance crisis, but they are proactive.

3.2.2 Change Outcome

The most common way to categorize organizational changes is perhaps based on the radicality of change (e.g. Dunphy and Stace, 1988; Nadler and Tushman, 1989; Gersick, 1991). The classification dates as far as to Darwin's model of evolution, as the Darwinian gradualism based on incremental, cumulative and continuous change has been challenged with the model of punctuated equilibrium (Eldredge and Gould, 1972). The punctuated equilibrium paradigm considers evolution as relatively long periods of stability, punctuated by compact periods of qualitative, metamorphic change. The periods of stability are referred to as equilibrium, and a highly durable underlying order or deep structure persists and limits change during the

equilibrium periods. The fundamental issue in punctuated equilibrium is thus whether change happens within the existing deep structure or disassembles it. According to the model, change obeying the existing order is incremental and gradual as opposed to revolutionary, transformational change. (Gersick, 1991) Adapted from Dunphy and Stace (1988), other related concepts of radicality of organizational change are summarized in Table 8.

	Classification	**Essential difference**
Gersick, 1991	• Gradual change • Revolutionary change	• Sustains existing deep structure or underlying order • Breaks and replaces existing structure or underlying order
Dunphy and Stace (1988)	• Incremental (evolutionary) change • Transformational (revolutionary) change	• Continuous, small • Discontinuous, large-scale
Levy (1986)	• First-order change • Second-order change	• Change within the basic rules of the system • Paradigmatic change that involves change in the "metarules" (the rules of the rules) of the system
Tushman et al. (1986)	• Convergent (incremental, evolutionary) change • Frame braking (transformational change, upheaval)	• Compatible with the existing organizational structure • Discontinuous, system wide. Concurrent shift in strategy, power, structure and controls
Fiol and Lyles (1985), - organizational learning	• Lower-level learning • Higher-level learning	• Behavioural change, occurs within a given organizational structure • More cognitive change, adjusts overall rules and norms and not only specific activities or behaviours
Miller & Friesen (1984)	• Evolutionary (incremental) • Revolutionary (dramatic)	• Low number of contemporary changes, piecemeal • High number of contemporary and extreme changes, multi-faceted
Greiner (1972), -organizational life cycle	• Evolution • Revolution	• Uses the dominant management style to achieve stable growth • Due to a problem, creates a new management pattern before stable growth can continue

Table 8. Some related classifications in the organizational change literature (adapted from Dunphy and Stace, 1988).

What is considered the most essential difference between the types - here labelled as radical versus gradual change - varies between the concepts. Agreeing with Gersick (1991), Levy (1986), Tushman et al. (1986), Fiol and Lyles (1985) and Greiner (1972) make the distinction based on whether the change happens *within existing structure*, or replaces it with a new one[2]. Some other concepts make the distinction to *continuous and discontinuous* change (Dunphy and Stace, 1988), and some based on the *number of contemporary changes* in the organizational elements (Miller and Friesen, 1984; Dunphy and Stace, 1988). The Figure 4 presents a model of an enterprise and its subsystems according to Salminen (2000) that may all be altered to change

[2] Gersick (1991) uses the term deep structure, Levy (1986) calls it the system's core or a paradigm and Greiner (1972) refers to management style or pattern.

simultaneously or a change may impact mainly one of the sub-systems having only minor effects on few other elements.

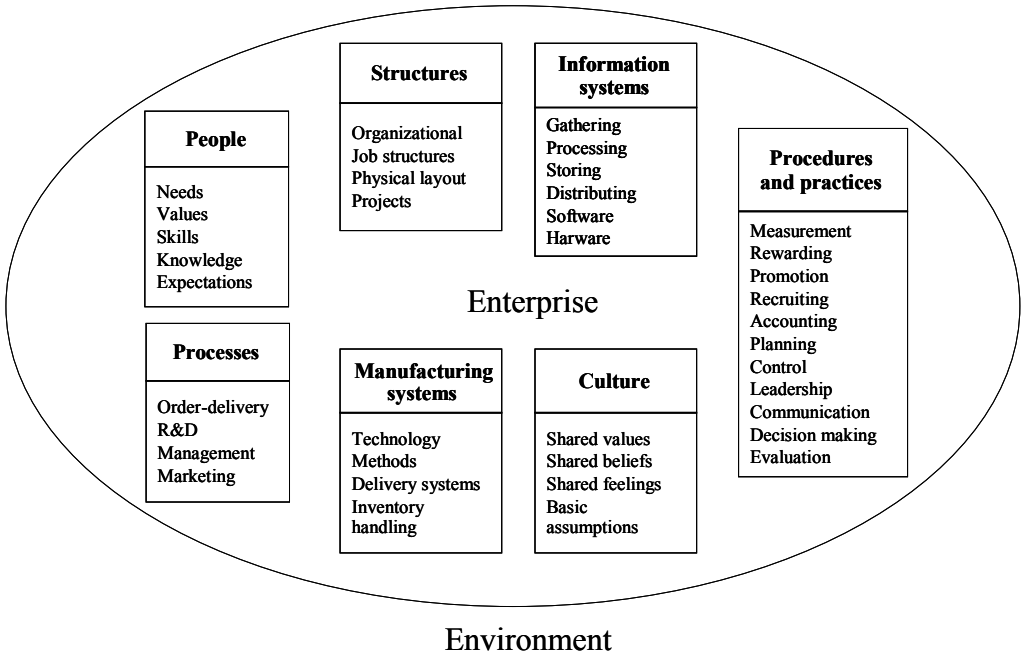


Figure 4. Enterprise and its subsystems (Salminen, 2000, p. 42 based on Beer, 1980 and Cleland and King, 1983).

Confusion of the fundamental difference has resulted in disagreement of the terminology and the relationship between radical and gradual change: are they alternative, nested or complementary concepts. Whereas Gersick sees both gradual and radical change as different types of evolution, many other authors (e.g. Dunphy and Stace, 1988 and Pettigrew, 1985) consider evolutionary change an opposite to radical change. As well, numerous authors claim that large scale, strategic change requires radical change (e.g. Greiner, 1972; Stace and Dunphy, 1994; Nadler and Tushman, 1989; Greenwood and Hinings, 1996). Miller and Friesen (1984) explain the importance of radical change to be economic: the interdependency between structural elements of an organization requires multifaceted change that is expensive, so rational companies postpone change until a critical state of incongruence with environment is reached. Therefore, as change occurs seldom it must be radical to remedy the serious mismatch between the organization and its environment (see also Miller, 1982). The drawbacks of the logic are that change is motivated merely by its costs and not by its benefits, and the cost of change is considered fixed regardless of how and when the change is carried out.

Quite the contrary, Eisenhardt (1989b) argues that in high-velocity industries a relentless and continuous change is crucial for survival and Nonaka (1988) suggests to continuously renew organizations in dynamic co-operation with their environment. Mintzberg and Westley (1992) also note how broad, more conceptual strategic change should - in addition to conceiving of the higher level - include work also in the lower, more concrete level. Brown and Eisenhardt (1997) actually challenge the whole distinction to either incremental or radical change and propose that there is change that is continuous and yet rapid and innovative. Also Reger et al. (1994) suggest a third approach, tectonic change as the most appropriate model instead of gradual or radical change that only rarely fit to the context of change. By tectonic change they refer to change that is driven by a gap between the current and ideal organizations, which is wide enough to make the change seem necessary, but still attainable without destructive stress.

Furthermore, despite the numerous models, the distinction between radical and gradual changes is not even theoretically clear. Gersick (1991) gives an example that in the context of a basketball game, a radical change would be taking the hoops away, whereas a gradual change would be moving the hoops higher as it does not change the rules or the playing field design. But, is taking one hoop away first and the other one after some time, a series of gradual changes or a radical change? In the context of complex organizational change the distinction is even more difficult to make, because a change may include various changes of structures in different levels.

A more practical classification from the managerial implications' point of view is the *extent* of change, referring to how extensive organization is affected by the change. Salminen (2000) categorizes change based on the scale; an example of a small-scale change is reorganization of job structures at the workplace level, whereas changing the organizational structure of a whole enterprise would represent large-scale change. According Stace and Dunphy (1994), the different levels of change including examples of typical interventions within the levels are:

1. Macro intervention affecting the whole organization or system: Strategic analysis, vision or mission development, strategic benchmarking, corporate business process redesign and corporate restructuring or rightsizing
2. Major intervention affecting a business unit: Business unit formation, strategic repositioning or business planning, TQM and continuous improvement programs, recruitment of new leadership and re-engineering the work system
3. Intergroup intervention: Intergroup team-building strategies, restructuring of work teams and work process redesign

4. Personal intervention: Personal development, professional development, job redesign, and leadership development.

As a conclusion, to avoid taking a stand on the role and relationship between radical and gradual change, the scope of this study concerning change outcome will be defined based on four separate dimensions that may or may not be connected: 1) structure-replacing versus structure-sustaining, 2) continuous versus discontinuous, 3) number of contemporary changes and 4) the extent of the changes in the organization.

3.3 Change Process

Classifying change based on the process refers to the means and progression of events in the changing organization. A practical way to classify change processes is based on the *duration* of the process or the *resources*, such as money and people, invested in carrying out a change. In addition, a change process may be categorized according to its nature. Related to the nature of the change process, Van de Ven and Poole (1995) performed an inductive examination of different theories that explain change processes in the disciplines of social, biological and physical science. Although the theories varied in substance or terminology, most of them could be grouped into four basic schools of thought: life cycle, teleology, dialectics and evolution theories. The four groups are distinguished from each other based on either unit of change or mode of change as illustrated in Figure 5.

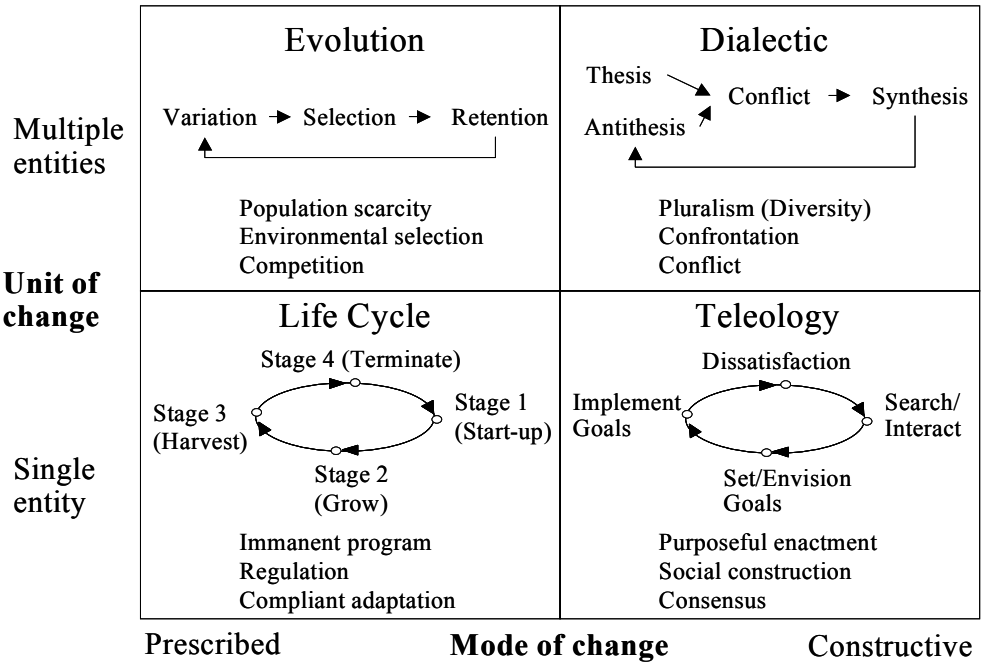


Figure 5. Process theories of organizational development and change (Van de Ven and Poole, 1995, p. 520).

The unit of change can either be a single entity - individual or organization - or the focus can be in the interactions between people or relationships between organizations. The mode of change describes whether the sequence of events is prescribed by deterministic or probabilistic laws, or constructed by the changing entity itself as the change process progresses. (Van de Ven and Poole, 1995).

Evolutionary change refers to change through continuous cycle of variation, retention and selection among numerous organizational entities regardless of the rate of change. The outcome of the evolutionary process may thus be either radical or gradual depending on the timely distribution of the variation, retention and selection events throughout the organization. The *dialectic* school assumes that an organizational entity exists in a pluralistic world of colliding forces and contradictory values that compete with each other for dominance and control. When the opposing values or events gain sufficient power to confront and engage the status quo, change occurs. (Van de Ven and Poole, 1995) Concerning change implementation, an evolutionary process could be construed as a competition of various changes taking place throughout the organization, some of which gain dominance over others. Dialectics then would mean implementing a solution constructed by integrating conflicting changes in the organization.

Life-cycle theory considers that the developing entity has within it an underlying logic or program that prescribes the process of change and moves the entity from the point of departure towards an end, which is prefigured in the present state. Thus, the events progress in a linear and irreversible sequence of prescribed stages. (Van de Ven and Poole, 1995) Life cycle thus implies that there is actually no change implementation, but the organization is being changed by forces outside its control and change is thus unintentional. According to *teleological* change a purpose or a goal is the final cause for guiding movement of an entity. The developing entity by itself or in interaction with others constructs an envisioned end state, takes action to reach it and monitors the progress. (Van de Ven and Poole, 1995) Teleology is considered the dominant process model in the theories of organizational change (Van de Ven and Poole, 1995; Salminen, 2000) and it implies change implementation to resemble a project with clearly defined targets and straightforward execution. Compared with evolution and dialectics, teleology seems to neglect the unexpected factors - both internal and external - that may affect change implementation.

Another classification that suggests two distinct fundamental processes of change - here labelled as *planned* and *emergent* change according to e.g. Burnes, (1996), Macredie and Sandom (1999), Farrell (2000) and Weldon (2000) - confirms the dominance of teleology, but also provides an alternative approach. Corresponding to teleology, planned change is defined as change that "originates with a decision by the system to deliberately improve its functioning" (Levy, 1986, p. 6). Whereas planned change is characterized as formal, the alternative emergent change is informal, even ad hoc (Weldon, 2000). The emergent approach has been defined as change whose impetus originates outside the organizational system and which is an adaptive response typically focused on the alteration of relatively clearly defined and often narrow segments of the organization (Porras and Robertson; 1990). Lippitt et al. (1958) describe unplanned change as spontaneous, evolutionary, fortuitous, or accidental.

Planned change as a term is rather established in the field of organizational change and is commonly considered as the process suggested by the Organization Development (OD) theories (e.g. Burnes 1996; Porras and Silvers, 1991). According to Burnes (1996), emergent change then stems from the theories of continuous improvement and organizational learning and is mainly based on the scepticism towards planned change, rather than being a uniform model of change process itself. The distinction between formal, planned change and informal, emergent change also appears in Mintzberg's (Mintzberg, 1983; Mintzberg and Waters, 1985; Mintzberg, 1990) discussion of how organization strategies develop and change.

Kanter et al. (1992) have as well presented a related distinction to "bold strokes" and "long marches". Bold strokes are changes characterized by decision making at the top, high control of a leader that can command results and clear acts as the initial results of the change. Conversely, the long marches cannot be mandated in practice, but require initiatives throughout the organization and involve a more extended process of changing organizational habits. (Kanter et al. 1992) Change process has also been classified as deductive or inductive. Deductive change is considered as proceeding from the conceptual to the concrete, from thought to action, as broad changes in concepts or perceptions are worked through deductively to their most tangible manifestations. But, organizational change can also be inductive, from the concrete to the conceptual, as the implications of tangible changes are generalized into broader perceptions either deliberately or in emergent fashion. (Mintzberg and Westley, 1992)

Planned change is defined as proactive change that organization members deliberately initiate and implement to anticipate or respond to alterations in the environment or to pursue new

opportunities. The planned approach is further described as change that is initiated from inside the organization to deal with anticipated environmental demands and that typically affects many segments of the organization (Porras and Robertson, 1990). Rather than being a response to problems that have already occurred, the planned change approach advises to anticipate events and search for opportunities to improve (e.g. French and Bell, 1999; Cummings and Huse, 1985; Kotter, 1995). Mintzberg (1990) further characterizes the approach of formal planning with the notion of a big picture, grand strategy or an overall concept of the future state as a result of a tightly controlled process of conscious thought. An essential feature of planned change is also the importance of leadership and top management (e.g. Burnes, 1996; Farrell, 2000). In Farrell's (2000) study about the relationship between the change process, market orientation and learning orientation, one of the measures indicating planned approach to change was that the change emanates from senior management. Also Burnes (1996) points out that in planned change top management is not only responsible for initiating the change, but also planning and implementation is carried out centrally.

A pivotal element in planned change is, as the title manifests, planning of the change. The change process is sequential (Burnes, 1996) as implementation follows only once the strategies have been formulated (Mintzberg, 1990). Farrell (2000) operationalizes the planned approach as a change that occurs through a systematic process of well-managed events and is monitored through regular progress surveys. According to Weldon (2000), in planned change the process is a formal and calculated procedure that is introduced and actively managed, usually by top management, and the change process is distinct from the usual activities of the organization. The formal approach to change holds a strong implication that the target state and the means towards it appear fully formulated and explicit, ready to be implemented as the final conception (Mintzberg, 1990). Also Burnes (1996) recognizes the tendency for creating holistic and complete plan and projections as the basis for implementation.

Alternatively, change can be seen as *emerging* from the ongoing activity of organization actors as they respond to problems and opportunities (Weldon, 2000; Orlikowski and Hofman, 1997; Weick, 1993 and March, 1981). Porras and Robertson (1990) claim that if change is triggered primarily by something outside the organization that requires a coping response, it tends to be unplanned and mainly adaptive. Emergent change is also seen to be driven bottom-up: empowerment and participation in learning at all organizational levels is emphasized (Farrell, 2000). The ideas for change are generated while pursuing normal work activities, integrated into daily work (Weldon, 2000), and thus arise spontaneously from local innovations that are not

originally anticipated or intended (Macredie and Sandom, 1999). The top management's main responsibility in change is creating the vision and purpose of the change, whereas the actual implementation is carried out by the employees throughout the organization (Burnes, 1996).

Emergent change relies on a continuous process (Macredie and Sandom, 1999) of experiment and adaptation and thus allows iteration as well as trial and error. According to the emergent change the activities carried out during the change process should result in deep understanding through learning, information gathering and communication instead of only changing organizational structures and practices according to the plan (Burnes, 1996). Emergent change occurs through continuous learning about the environment and thus requires encouraging employees to understand and adapt to changing circumstances in the environment (Farrell, 2000). As opposed to a holistic big picture, emergent change is implemented incrementally: through many small-scale changes that over time can amount to a major organizational transformation (Macredie and Sandom, 1999; Burnes, 1996; Dawson, 1994). Orlikowski and Hofman (1997) also argue that although there is some understanding up-front of the magnitude of a change, the depth and complexity of the interactions among the activities under change is fully understood only as the changes are implemented.

While the planned approach to change represents the teleological process, the emergent approach involves common characteristics with the evolutionary process. In its extreme, the emergent approach could mean completely locally implemented changes throughout the organization for solving problems and reacting to opportunities locally prioritized. However, even the emergent approach involves a common vision or goal for the change throughout the organization, which directs the individual smaller change activities to sum up as more significant change.

The extant body of research provides ambiguous results regarding the superiority or applicability of the alternative approaches. The dominant theory of organizational change has been and is still based on the planned approach (e.g. DeCock, 1996; Dawson, 1994) and also recent studies have highlighted the importance of control and planning of the change process as a means for successful change (Salminen, 2000). On the other hand, Farrell (2000) argues that planned change strategies are less likely to lead to internalization of favourable attitudes (see also Fiol and Lyles 1985) and Narver and Slater (1991) found significant positive relationship

between the emergent approach[3] and market orientation, and no significant relationship between the planned approach and market orientation. In contrast, Farrell (2000) encountered positive impact between market orientation and both the planned and emergent approaches providing tentative support for the proposition that the planned approach may be successful if strictly focused on preparing effective experiential learning. Mintzberg shows that strategy formation in organizations involves both deliberate, intended strategy formulation and ad hoc, emergent strategy formulation (Mintzberg, 1983; Mintzberg and McHugh, 1985). These results do not justify restricting the scope of this research to study implementation according to either planned or emergent approach.

3.3.1 Scope of This Study

Figure 6 presents a summary of the various classifications of organizational change presented in this chapter. The three dimensions, origin, outcome and process of change, have been further divided, and the types of change that are of primary interest in this study is highlighted. The classifications support in understanding the phenomenon of organizational change and the scope of the study, but they are also somewhat problematic. Nearly each presented dimension is relative in nature and should rather be seen as a continuum between two extremes. Evaluating dimensions like speed or scale of change is difficult in absolute terms and thus makes sense only when done as a comparison between different change efforts. Also the categories in different classifications are idealistic and in reality a phenomenon may incorporate elements of more than one category. As Buchanan and Boddy (1992) note, categorizations are always perceptual, as changes perceived revolutionary in one organization may be commonplace in another. Thus, change can be categorized only in relative terms and bearing in mind the context.

In these specific classifications of organizational change, another problematic issue is the relations between the different dimensions: how do the dimensions of origin, process and outcome of change relate to each other? Is reactive change in a crisis situation necessarily quicker than anticipatory change as Nadler and Tushman (1989) claim? Is discontinuous change always fast? Although the number of resources used and the time spent in a change effort is meaningful only when considering also the impact and scale of the change, in this study the dimensions are treated separately for not restricting the viewpoint to change implementation.

[3] Narver and Slater (1991) use the term “market back” for an approach here labelled as emergent and “programmatic” approach for planned change.

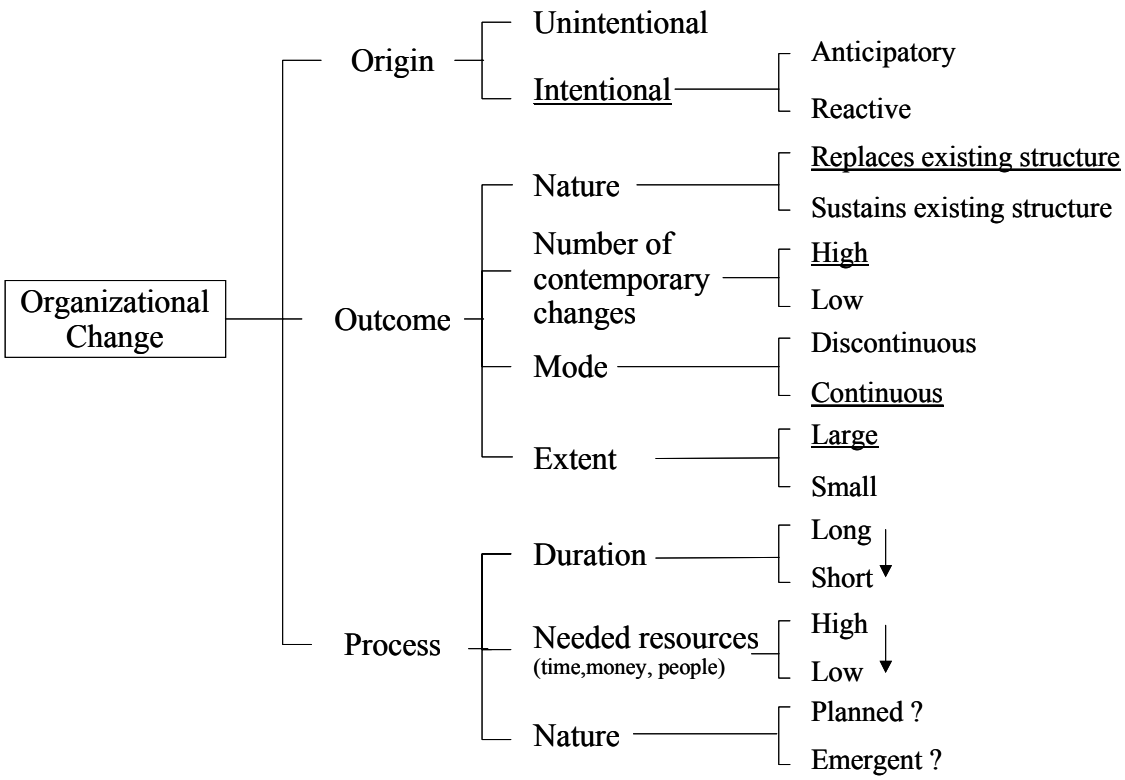


Figure 6. Scope of this study based on classifications of organizational change.

The focus of the study is on organizational change that is intentionally commenced by the organization itself. The changes happening to an organization without its own intent do not explicitly involve change implementation and thus excluded. The focus of this study is not on change due to a crisis, but on change for significantly improving business performance, which may be either anticipatory, reactive or most likely involve both characteristics. Concerning the change outcome, the primary focus of the study could be defined as change that replaces the existing organizational structure within the scope of the change. In the context of strategic business process change, it means a fundamental change in the structure and logic of the processes as opposed to improvements in executing the existing processes better. A fundamental change in business processes involves several subsystems of an enterprise, such as the specific business processes, related information systems, skills and knowledge of the people and procedures and practices. Thus, the number of contemporary changes is high rather than low, although changing the whole strategy and structure of a corporation including changes in what products it produces, in what markets it competes or what customers it serves, is not the primary focus of this study.

Further, the interest in this research is on continuous rather than on discontinuous change. For example, acquiring or selling a unit of a corporation is a discontinuous event that is not the primary concern in this study, but the changes that may need to be implemented prior and after the event are of relevance. Yet, continuous change as the scope of the study does not refer to never-ending change, but rather to change that requires implementation that continues for some time. Furthermore, the focus is on extensive organizational change that involves a large number of organizational units and members, as manifested already by the title of the study. More specifically, the emphasis is especially on large organizations that consist of numerous individual and diverse units operating in different environments. When managing change implementation, the aspects of time and resources used are also relevant, because they determine how efficiently an organization is able to implement change. Successful implementation must be efficient, and thus the study aims at elaborating an approach for producing change relatively fast and using moderate amount of resources. However, as the focus is on change that produces major improvements in business performance, the exact cost or schedule of the change is not of primary interest as long as it clearly undershoots the gains of the effort.

Rather than restricting the scope, the theories about the nature of change process provide interesting viewpoints to the study of change implementation. Evolution, dialectic, life cycle and teleology provide generic categories of change processes that are linked to extant theory of organizational change by the concepts of planned and emergent change. Despite of the dominance of the planned approach as an application of teleology, there is no undisputable evidence of its superiority. The emergent approach provides an alternative to the teleological process as it considers organizational change as an accumulation of individual changes in different parts and levels of the organization, like the evolutionary process. Thus, the concepts of planned and emergent change provide an interesting juxtaposition as a basis of this study that will be used for defining the research constructs in chapter 5.

4. THEORIES CONTRIBUTING TO ORGANIZATIONAL CHANGE IMPLEMENTATION

Implementing change in an organization is a topic that involves numerous different actions related to various elements of the organizational system. The change process types planned and emergent change presented in chapter 3.3 offer some basic viewpoints to change implementation. In addition, there are number of theoretical domains that provide specific models and suggestions for how to carry out organizational changes. In this chapter, change implementation is studied by presenting the most relevant theories related to organizational change. The main differences between the theories relate to the content and outcome of the change, but this chapter primarily deals with how they view implementation as part of the change process.

Organization Development theories look at change from the behavioural point of view. Theories of Organization Transformation highlight the relation between organizational change and corporate strategy. When considering change in business processes, the Business Process Reengineering paradigm cannot be ignored as it complements the behavioural aspects with the more content-specific elements as well as provides practical guidelines for implementation. An intentional change effort is typically carried out as a project and thus relevant parts of Project Management theory are also reviewed in this chapter. The theory of Organizational Learning then considers change implementation as a part of learning and thus provides a valuable and differentiating viewpoint.

4.1 Organization Development

Organization Development (OD) aims at improving organizational effectiveness and employee well being (Beer and Walton, 1987). Organization development focuses on the behavioural elements of change like organizational culture, processes and people as object of the change, and collaboration of the organizational members with an external change agent as a means for the change (Cummings and Huse 1985, French and Bell 1999, McCalman and Paton 1992). Altering organizational culture is often considered a prerequisite of permanent change (French and Bell, 1999). Beckhard (1969) defines organization development as a planned, organization-wide effort that is managed from the top to produce planned interventions in the organization's "processes", using behavioural-science knowledge.

There are a large variety of OD activities called interventions. Changes in organizational variables such as the formal structure, cost control systems, machinery, policies and procedures or job designs and responsibilities all target at changing the organizational members' behaviour that then alters the effectiveness of the overall system (Porras and Robertson, 1990). Typical OD change efforts involve innovative plant designs, participative management approaches, use of task forces to identify and solve problems, off-site team-building or mission-building sessions, employee ownership and quality circles (Kanter 1983; Porras and Silvers 1991). Cummings and Huse (1985) classify OD interventions to four types:

- Human process programs aimed at people within organizations and their interaction processes: team building, survey feedback and intergroup relations interventions
- Technostructural methods directed at organization technology and structures for linking people and technology: interventions concerning organization design, job enrichment or self-regulating work groups
- Human resource management interventions aimed at successfully integrating people into the organization: goal setting, reward systems or career planning and development interventions
- Strategic programs directed at how the organization uses its resources to gain competitive advantage in the larger environment

Porras and Robertson (1990) classify the implementation theory of OD to three levels: strategy, procedure and technique theories. The strategy theories describe the broad strategies that can be used to change human systems, the procedure theories then include descriptions of the major steps that must be taken in executing a complete change process: prescribing intervention steps, identifying the diagnostic variables, choosing a specific intervention, understanding conditions for effective change and characteristics of effective change agents. Technique theories then consist of perspectives that focus primarily on one of the core steps identified in the procedure theory, such as diagnostic theories, planning theories, micro-intervention theories and evaluation theories. Porras and Robertson (1990) consider the procedure theories most useful for the actual implementation, which also applies in this research.

An OD effort begins with awareness of a need for improvement (Ackerman, 1982) or with developing the need (Lippitt et al. 1958). An important element of OD theory thus is diagnosing the general problem areas of the organization prior to any intervention (Burke, 1982; Ackerman, 1982; Frohman et al. 1976; Bowers et al. 1975). Cummings and Huse (1985) see the diagnosis as a collaborative process involving both managers and consultants in collecting and analysing

data as well as drawing conclusions for action planning and interventions (see also Frohman et al. 1976). After assessing the present state, the next step is to develop an ideal model of the desired end state (Blake and Mouton, 1968).

Designing the ideal model is management-driven (Beckhard and Harris, 1977) and involves the entire organizational system, defined as being relatively free to determine its own plans and future, let it be an entire enterprise, a business unit or a rather independent department (Beckhard, 1969). Also French and Bell (1999) emphasize the interdependency of organizational components and the systemic nature of change. Thus OD in its purest form always deals with changes within a total system and its scope is overall organizational change targeting organization's culture (Burke, 1982; French and Bell, 1999), structure, processes (Cummings and Huse, 1985) and congruence among the various key organizational factors (Beer, 1980). The description of the organization's desired future state should be detailed and comprehensive and specify all the organizational elements (Beckhard and Harris, 1977; see also Porras and Robertson, 1990).

Clear definition of the target state is an essential element of OD, but so is a plan of how to reach that state - including timetables, intermediate goals and the activities to be carried out (Cummings and Huse, 1985; Dawson, 1994). Planning constitutes a key part of most OD intervention procedures (Porras and Robertson, 1990), and an essential part of the theory are the so-called phase models (Pakstys and Stoudt, 1998; Cummings and Huse, 1985; Bullock and Batten, 1985) that relate closely to the concept of planned change. Many different models of organizational change process have been presented, one of the earliest being a three-stage model (unfreeze-move-freeze) by Lewin (1947). Based on an analysis of a large number of phase models, Bullock and Batten (1985) conclude that a good model of organizational change consists of a linear sequence of change phases and reversible change processes that occur in each phase as illustrated in Figure 7. The idea of the model is that whereas the phases form a linear sequence, the processes can take place in whatever order and even iteratively inside the corresponding phase.

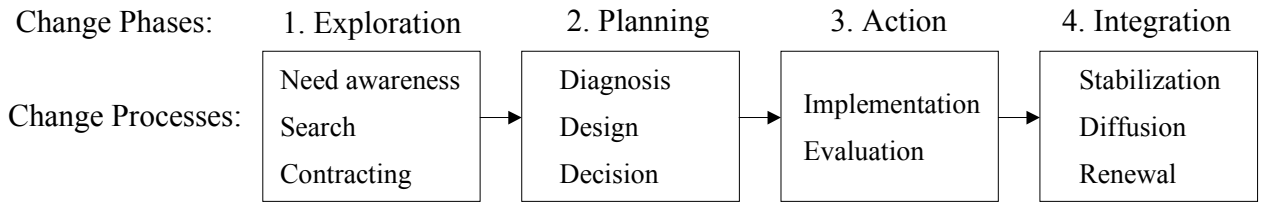


Figure 7. Outline of the four-phase model of organizational change (Bullock and Batten, 1985).

Yet another essential characteristic of OD is that the efforts are supported and managed from the top (Porras and Robertson, 1990; Beckhard, 1969; French and Bell, 1999). The top management's role is to articulate and propagate a vision or agenda of the future organization (Beer and Walton, 1987). In addition to top management involvement, a common feature of the OD theories is the emphasis that is put on the role of a consultant acting as a change agent (e.g. Dunphy and Griffiths, 1998). An external change agent, nominated and supported by the top management, typically designs and sequences the interventions following his or her diagnosis of an organization's needs and shortcomings (Beckhard and Harris, 1977; Beer and Walton, 1987). The OD consultant helps organization members examine current difficulties and their causes (Burke, 1987). The role of an OD consultant or change agent is usually one of a facilitator that conducts interventions, which are reflective and self-analytical by nature (French et al. 1989; Dunphy and Griffiths, 1998), but he or she can also be seen as the project manager of the change (Buchanan and Boddy, 1992).

According to Porras and Robertson (1990), the degree and quality of organizational member involvement is one of the most important conditions for effective change. Thus, in addition to top management involvement, the commitment and involvement of all other organizational members is considered essential (Beer and Walton, 1987). Involvement of the organizational members is seen as a means for overcoming change resistance, which according to Reger et al. (1994) can be either passive or active. Passive resistance results from a failure to fully comprehend the change and active resistance from direct conflict between the new initiative and the valued elements of current organization.

The OD approach has also been object to criticism. Harrison and Storey (1996) claim that OD fails to connect the social issues with the technical and operational side of change. Porras and Silvers (1991) acknowledge that OD produces appreciable, but not radical, change in individual

employees' cognition as well as behaviours. Porras and Robertson (1990) also note how the OD theories emphasize process over outcomes. They claim that an implicit assumption in many views has been that improvements in organizational processes will automatically lead to improvements in system outcomes. A widely shared view is that the OD approach to change is related to environmental stability, which is not the case in the contemporary organizations struggling with massive organizational and economic restructuring (Stace and Dunphy, 1994; Dawson, 1994). These changes in the environmental conditions have increasingly called for large-scale organizational change involving total structures, management processes and corporate cultures instead of just few components of organization (Beer and Walton 1987; Kimberly and Quinn 1984; Miller and Friesen 1984; Schein 1985; Kilmann et al. 1985; Harris 1985), although the theories of OD clearly indicate that the scope involves overall organizational or system wide change (Beckhard 1969; Beer 1980; Cummings and Huse, 1985). The discrepancy may stem from a difference between the OD theory and its practical applications.

Beer and Walton (1987) criticize the consultant-centric view of OD and propose having general managers at the centre of change for bringing in more knowledge of the business and tasks, understanding of the competitive environment and the opportunities for change. However, Dunphy and Stace (1988) note that the business environment is often so complex and turbulent that it is impossible also for senior managers to accurately anticipate the future conditions that represent opportunities and threats to further development. Pasmore (1994) thus considers true workforce participation as a potent force to enhance organizational survival and criticize it being viewed only as a “gimmick” to increase satisfaction and motivation. Also Beer et al. (1990a) raise up the problem of programmatic change where changes are imposed from the top to provide "off-the-shelf" standard solutions that do not meet the individual needs of different parts of the organization.

Buchanan and Boddy (1992) doubt the assumption that change unfolds in a sequential manner as proposed by the phase models. They argue that the main emphasis in these models lies with the clear statement and definition of objectives, responsibilities, deadlines and budgets. Consequently, successful change implementation is attributed to the clarity of specifying those dimensions and to the effectiveness of monitoring and controlling that the project stays on target. It is claimed that change can not be carried out by following a grand master plan once made, but there needs to be a continuous readjustment of the direction and goals (Pettigrew 1985). McLean et al. (1982) further claim that it should be possible to identify opportunities and

take advantage of emerging events during the change, whereas Boulden and Lawlor (1982) call for learning by doing.

Based on the critics, alternative approaches to OD have also been suggested. Systemic task alignment presented by Beer et al. (1990a) as an alternative for the typical programmatic approach of carrying out OD interventions emphasizes the importance of local unit level implementation even in a centrally led effort. Task alignment is considered to obtain the benefits of both top-down and bottom-up change while minimizing their disadvantages. To succeed, systemic change in a series of targeted smaller units such as individual manufacturing plants and divisions is proposed. Whereas the programmatic change efforts aim at behavioural change as a consequence of changes in individual knowledge, attitudes and ideas, the primary focus in the systemic task alignment is behavioural change, followed by changes in attitudes. Dawson's (1994) processual approach views change as a complex and dynamic process and provides a framework for the process of transition. Although argued to be an alternative approach for OD, the processual approach seems like a framework for analysing change rather guidance for the practical change implementation.

As a summary, it can be stated that OD theory suggests implementation ideally to be:

- Initiated based on a designed description of future state as a result of a diagnosis of the organization
- Managed by top management and external change agent that involve employees
- Sequential process defined in a plan made in the beginning of implementation
- Realization of the complete description of the future state that is a prerequisite for implementation.

4.2 Organization Transformation

Organization transformation (OT), also called second generation OD (Porras and Silvers, 1991), strategic change (Dunphy and Griffiths 1998) or strategic transformation (Salminen, 2000), is considered an enhanced approach arisen from the critics of OD that supports radical and large-scale change. With its strategic focus, OT also relates to the stream of strategic management that emphasizes strategy implementation in contrast with strategy as competitive positioning (Porter, 1980) or core competence definition and development (Hamel and Prahalad, 1990 and 1994). The concept emphasizes the magnitude and urgency of change and implies that a structure-breaking, strategic approach is required in the circumstances that many enterprises currently

operate (Dunphy and Stace, 1988). Pasmore (1994) states that during the past two decades changes like globalization, desire for speed, technology, environmental consciousness, diversity of people as consumers, quality and downsizing have resulted in a need for organization transformation, irreversibly. Thus, as opposed to transferring an organization from its current state to some future state or developing it to be better at what it does, transformational change means emergence of a totally new, unforeseen state out of the remains of the old (Ackerman, 1986).

Organization development is considered having focused too narrowly on internal efforts and thus neglected the role of environmental factors (Beer and Walton, 1987). On the contrary, organization transformation is initiated or at least affected by external factors and often also related to a crisis situation. According to Cummings and Huse (1985), both environmental and internal disruptions may trigger transformations. Dunphy and Stace (1988, p. 320) claim that organizational transformation is caused by an externally imposed change or as the "only way to bring the organization back into fit with its environment". Thus, transformational change applies under conditions of widespread economic restructuring, recession and discontinuity. When the organization is markedly out of fit or the environment changes dramatically, a more discontinuous change process is needed for the organization to survive. (Dunphy and Stace, 1988)

Transformation is closely linked to strategic business issues and thus it is not a question of changing only organizational process or style (Nadler and Tushman, 1989; Vollmann, 1996). Transformational change requires abrupt shifts in most parts and components of the organization, such as total structures, information systems, human resource practices, management processes and corporate cultures (Vollmann, 1996; Beer and Walton 1987; Kimberly and Quinn 1984; Miller and Friesen 1984; Schein 1985; Kilman et al. 1985; Harris 1985). Porras and Silvers (1991) differentiate transformation from the traditional organization development based on the object of change: whether it is only the works settings or involves the organizational vision as well. According to Nadler and Tushman (1989), transformational change affects an entire organization, whether it be a corporation or a business unit, rather than individual strategic business units or departments. On the other hand, Hall et al. (1993) present a contradictory finding that the most successful transformations are not considered as a once-and-for-all effort, but as a series of waves washing over the organization for a period of years, leaving a system for continuous improvement in place.

While the scope and magnitude of change are considered distinctive to OT, the process of transformational change commonly applies similar phase models as OD (Kotter, 1995; Walton, 1995; Porras and Silvers, 1991). According to Dunphy and Griffiths (1998) the transformation approach focuses on planned, purposive competitions and begins by looking outward from the firm, scanning the competitive environment. Once a viable strategy is determined, an implementation plan is put into place that will reposition the organization so as to capitalise on the new strategy. Kotter (1995) presents eight steps to transforming an organization: 1) establish a sense of urgency, 2) form a powerful guiding coalition, 3) create a vision, 4) communicate the vision, 5) empower others to act on the vision, 6) plan for and create short-term wins, 7) consolidate improvements and produce still more change and 8) institutionalise new approaches. He stresses that none of the stages should be skipped, but the change process typically operates simultaneously in different stages in different sub-projects of the complete transformation effort. Cummings and Huse (1985) present a different view to the deterministic phase models as they state that undertaking transformational change is much more uncertain than fine-tuning the organization, and thus requires considerable innovation and learning, which occurs at all levels of the organization and the process is likely to be substantial.

Different views also exist on the pace of a transformation. Some authors justify the whole paradigm of transformational change based on the slowness of organization development (Dunphy and Stace, 1988; Miller and Friesen, 1984). On the other hand, Nadler and Tushman (1989) claim that just like in incremental change, also in transformation the pace depends on whether the organization is anticipating or reacting to an external change. Based on the need for continuous learning during the transformation, Cummings and Huse (1985) note that the effort is likely to persist as long as the firm needs for adapting to the change. Yet, they do recognize that the time frame rarely is unlimited because the environment is likely to be very dynamic during the change process. Kotter (1995) agrees that real transformation takes time, but compelling evidence of the ability to reach the expected results should be available within 1-2 years, whereas Anderson et al. (1985) studied 17 transformation efforts, each of which lasted 5-10 years.

Due to being closely linked with the corporate strategy, a transformation effort is considered to be initiated by the leaders of the organization rather than consultants of human resources specialists (Nadler and Tushman, 1989; Beer and Walton, 1987). Cummings and Huse (1985) assert that the senior executives and line management that are responsible for the strategic direction and operation of the organization have to lead the transformation. They decide when to

initiate transformational change, what the change should be, how it should be implemented and who should be responsible for directing it. Also the studies of Pettigrew (1985) indicate the importance of strong, persistent and continuing leadership to create strategic change. Dunphy and Stace (1988) state that both OD and OT may apply either coercive or collaborative approach to leadership. They make a distinction between dictatorial and charismatic transformations and propose that the charismatic approach is applicable when the key organizational stakeholders accept the need for large-scale transformation and when there are no widely divergent views on how to bring the organization back to fit. Conversely, dictatorial transformations are more common in turbulent recession times when major organizational restructuring may conflict with the interests of key internal groups and thus external force or authoritative coercion may become the only means to ensure organizational survival. (Dunphy and Stace, 1988) On the other hand, close involvement of those who will be most affected by the change has been recognized as a condition also for successful strategic change (Burnes, 1992).

The underlying assumptions of organizational transformation have also been criticized. Dunphy and Griffiths (1998) state that the newly dominant strategic approach is based on rational assumptions that senior executives have the power to introduce rationally devised strategic plans and implement them as planned, which has lead to major debate on the field about the relative value of deliberate and emergent strategies (e.g. Mintzberg and Waters, 1985; Prahalad and Hamel, 1990; Macintosh and Maclean, 1999). As a consequence, the problematics of strategy implementation have gained increased importance. Strategic management is no longer seen as simply the formulation and linear execution of strategy, but it is recognized that strategies may be thoroughly reworked and elaborated as more and more organizational units and stakeholders become involved in the process of corporate change and influence the emergent strategies (Dunphy and Griffiths, 1998; Quinn, 1980). Also Liedtka and Rosenblum (1996) note that the broad institutional vision must not only be locally executed, but it must also be shaped and defined in an iterative and on-going way using local knowledge. Ghoshal and Bartlett (1995) point out that in this opportunistic approach that relies on local knowledge, decision-making authority must be shared in order to encourage and support entrepreneurial initiative taking.

As the theory of transformational change is relatively young, it is not as well defined as the theory of OD. Whether it provides a truly alternative approach to OD or only a difference of emphasis in terms of the object and magnitude of the change, remains somewhat unclear. Recognizing the different views related to the locus of power during change or linearity and

pace of the change process, the dominant views of organization transformation to change implementation are summarized as follows:

- Initiated through a vision based on strategic need, often due to external changes
- Lead centrally by top management
- Sequential and linear process, although more responsiveness called for
- Involves most parts and elements of the organization at once.

4.3 Business Process Reengineering

Business Process Reengineering (BPR) emerged from two different paradigms: 1) total quality management (TQM) that proved to have limited contribution to radical transformation while focusing on improvement of current practices in an incremental and continuous manner and 2) sociotechnical systems that considers change to affect both the people and the technical elements of an organization (Jaffe and Scott, 1998). According to Hammer and Champy (1993, pp. 31-32) business process reengineering is the "fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed". Reengineering is not about incremental improvements in the old processes, but about inventing a better way of delivering value to customers. The Reengineering Handbook (Manganelli and Klein, 1994a) further defines reengineering as rapid and radical redesign of strategic, value-added business processes and the systems, policies and organizational structures that support them, which implies that reengineering can also be seen as an application of organization transformation. However, Fisher (1996) notes that although aiming at innovative process solutions, the scale of a BPR effort can still vary from improving a single existing process to revolutionizing the way in which a company operates.

BPR originally focused on radical process changes enabled or implemented through innovative use of information technology (Hammer 1990), but IT is not always the primary driver of reengineering efforts (Dixon et al. 1994). Reengineering triggers changes of many kinds, not just of the business process itself: the organizational elements associated with the process, such as job design, organizational structure and management systems, must be refashioned in an integrated way. Thus, reengineering mandates change in many areas of the organization (Hammer, 1990). As Manganelli and Klein (1994b) put it, business processes do not exist in a

vacuum, but are facilitated by a support infrastructure, which must be aligned with the newly reengineered process flows.

In line with the presented definitions, Davenport and Stoddard (1994) list five primary concepts that make up reengineering:

- A clean slate approach to organizational design and change
- An orientation to broad, cross-functional business processes, or how work is done
- The need for, and possibility of, radical change in business performance
- Information technology as an enabler of change in how work is done
- Changes in organizational and human arrangements that accompany change in technology.

Burgess (1998) states that BPR requires practitioners to move beyond their current perception of the world and question the very foundations upon which they do business. At the heart of reengineering is the notion of discontinuous thinking; recognizing and breaking away from the outdated rules and fundamental assumptions that underlie operations (Hammer, 1990). However, Davenport and Stoddard (1994) make a firm distinction between clean slate design and clean slate implementation and agree that it is useful to design a target state of outright processes to direct the development, but the development may still be piecemeal over several years.

Business process reengineering is based on viewing business as processes instead of functions, and the aim is to optimise processes so that they bring maximum value to the customers as efficiently as possible. While in a functional organization work has mainly been organized as a sequence of separate tasks and complex mechanisms to track its progress (Hammer, 1990), important characteristic of a process is that it has either an internal or external customer and it crosses organizational boundaries (Davenport and Short, 1990). Optimized processes can be realized through changes like combining several tasks together, bringing decision-making part of the actual work and performing work where it makes the most sense regardless of the functional boundaries (Pollalis 1996). Manganelli and Klein (1994b) claim that not all processes are relevant in reengineering, but only the strategic and most value adding ones. According to Miller et al. (1992) reengineering focuses on the key value creation processes, such as order fulfilment (the customer supply chain process), product development, order creation (selling and configuration) and customer service (post product delivery processes). Furthermore, BPR should be motivated by objectives derived from the strategic business vision, such as cost reduction,

time reduction, output quality or quality of work life. Whatever the objectives in a specific effort may be, they should be clearly defined and even quantified. (Davenport and Short, 1990)

Reengineering is carried out through projects or programs with clear start and end (Dixon et al. 1994), as well as defined targets (Davenport and Short, 1990). The initiatives are considered to consist of different phases, and several practitioners and researchers have proposed their own sequential models of how reengineering should be carried out in an organization. Lowenthal (1994) proposes a four-stage model that consists of 1) preparing for the change, 2) outlining the change, 3) design of the change and 4) evaluation of the change. Petrozzo and Stepper (1994, pp. 6-9) also divide reengineering into four phases called "discover", "hunt and gather", "innovate and build" and "reorganize, retrain, retool". A third model outlines general phases of reengineering project to include 1) determining the requirements, 2) designing the new process and system, 3) building the new process and system with organization structures, roles and responsibilities and 4) implementing and deploying the change (Moosbroker and Loftin, 1998).

The main focus of business process reengineering is on achieving major business benefits through designing optimum business processes. Davenport and Short (1990) claim that managing process change is similar to managing any other types of change, except that its cross-functional nature increases the number of stakeholders and thereby the complexity of the effort. It is clear that no process improvements can be implemented in an organization without successful change management (Grover et al. 1995). Thus, the generic change management theories have been applied in reengineering initiatives as well. Dixon et al. (1994) state that reengineering efforts tend to be managed top-down and numerous other studies confirm that in addition to excellent process solutions, successful reengineering efforts include strong leadership engagement (Jaffe and Scott 1998; Tulloch 1993; Johansson et al. 1993; Hammer, 1990; Davenport and Short, 1990). As well, employee participation to eliminate change resistance and motivate people has been recognized as an important success criterion (Jaffe and Scott 1998; Tulloch 1993; Lowenthal 1994; Johansson et al. 1993).

Business process reengineering as a tool for implementing change has been criticized for its assumption of a deterministic process with no support for flexibility due to internal or external reasons. Wilson (1999) states that as the world today is unpredictable and fast changing, it is unrealistic to believe that major business benefits could be realized through reengineering programs that typically last for more than one year. The real business complexity should not be ignored by simply executing the plans once made through a rigid approach that relies on

planning, measuring and controlling. Jarrar and Aspinwall (1999a) claim that instead of relying on perfect planning, the best way to learn how to reengineer or implement change is by doing it.

As a summary, it can be stated that BPR theory suggests change implementation ideally to hold the following characteristics:

- Initiated based on a process redesign derived from strategic vision and motivated by (measurable) performance improvements
- Strong leadership as well as participation to overcome change resistance
- Sequential process
- Implementation based on a holistic design of optimal, cross-functional business processes and related organizational elements.

4.4 Project Management

If a project is defined as "a temporary endeavour undertaken to create a unique product or service" (PMBOK 1996, p. 4), an organizational change effort can also be considered to be a project (see also Turner and Cochrane, 1993). Project management then is the planning, organizing, monitoring and directing of project activities to produce the desired output and business value (Sieli 1991). The essential role of a project manager thus involves co-ordinating the work of others through planning, scheduling, organizing, leading and controlling. Planning includes the definition of the results to be achieved and the means for achieving them. Organizing means converting the plans into tasks and assigning authority. Leading requires the manager to create and maintain close contacts with individuals in the project organization to influence them to accept and work towards the organizational goals. Controlling constrains the activities to ensure that the actual outcomes are consistent with the planned ones. (Davies 1994, see also Lewis, 1997) In short, the most obvious tasks of project management thus are to plan the work, “work the plan” and monitor achievement (Sharratt and McMurdo 1991).

Successful project management has been commonly modelled as project lifecycle. A project lifecycle consists of sequential phases, for example such as conceptualizing, planning, execution and termination (Adams and Barndt 1983). Based on different, but analogous models (see e.g. Morris, 1982; Roman, 1986; Maylor, 1996 and Kerzner, 1998), a generic four-phase model can be concluded. A project begins to take shape in the first phase when the need of a project is identified, preliminary analysis is carried out and the first plans are presented to top management to gain their commitment. In the next phase project plans, including work

breakdown, costs, schedule and organization, are completed and resources allocated to the project. Next, when the physical realization takes place the task of project management is preliminary to motivate, control and direct. Finally, the outputs of the project are handed over and the project is evaluated. (Salminen 2000)

Project management theories view implementation as execution of the project plan. In the beginning of a project, the project mission is defined and more specific goals and objectives are derived from it (Pells, 1993). The hierarchy of targets defines the results that must be achieved in order for the overall mission to be accomplished. Project planning - estimating the time, cost and resources of a complete project – is advised to be done top-down by dividing the complicated task into several smaller tasks (e.g. Dinsmore, 1993). This process can be continued until the task can no longer be subdivided, and the result is called the Work Breakdown Structure (WBS) of the project. (Lewis, 1997) Although it is recognized that a project scope and plan seldom remain totally constant, project management theory emphasizes proper and comprehensive definition of the project outcome and tasks prior to implementation (Lewis, 1997; PMBOK, 1996; Pells, 1993). The ideal is that the scope and tasks of the project remain constant throughout the project; deviations from the plan are considered as failures that are to be corrected preferably by getting the project compliant with the plan, or if impossible, modifying the plan according to the changed reality (Lewis, 1997).

Time, cost and quality are commonly considered as the main success factors of a project (e.g. Turner, 1993), but also more detailed and extensive lists have been defined including elements like project mission, top management support, project schedule and plans, client consultation, personnel, technical tasks, client acceptance, monitoring and feedback, communication and troubleshooting as the ability to handle unexpected crises and deviations from plans (Pinto and Slevin, 1988). Although organizational change can be considered a project, it differs from many other types of projects, because both the goals of the project as well as the methods used are not well defined (Turner and Cochrane 1993). According to Turner and Cochrane (1993) developing the actual solutions leading to the goals is itself an important part of an organizational change project, whereas the classical project management theory considers having clear goals, targets and methods as pre-requisites for project success.

The classical project management approaches relying on the assumption that planned change unfolds in a logically sequenced manner, and that the participation of those affected is just a one step in the implementation process, have been criticized (Buchanan and Boddy 1992). Cleland

(1994) proposes that the project lifecycle models should be treated as a flexible, ever changing framework, as no matter how thorough the planning phase is, some aspects will process differently and replanning needs to be done. Roman (1986) emphasizes that despite the requirement of systematic project control it is impossible to generate an all-encompassing control system and that project and situation specific features have to be taken into account and creativity and innovativeness used for coping with diffused projects. Sharratt and McMurdo (1991) recognize the behavioural aspect to be an important element in projects where drastic changes in people's work may cause unpredictable reactions. The behavioural aspect thus means recognizing the motivational factors, resisting factors, and working hard to modify behaviours and attitudes.

As a summary, it can be stated that the classical Project Management theory suggests change implementation to be:

- Initiated based on explicitly defined goals
- Managed centrally by project manager and supported by project sponsor
- Sequential process defined and controlled by a project schedule
- Directed by a complete hierarchy of goals and tasks.

4.5 Learning Organization

A learning organization is commonly considered as the target of organizational change (Beer and Eisenstat, 1996; Albert 1998), but it can also be seen as an alternative approach for bringing about organizational change (e.g. Nonaka, 1988). An additional viewpoint to the relation between organizational change and learning is to acknowledge elements of the learning organization theory as essential aspects of planned, transformational change (Cummings and Huse, 1985) or reengineering (Jarrar and Aspinwall, 1991a). Roth et al. (1994) view BPR as a tool for executing actions as part of an organizational learning process and on the other hand a facilitator of learning.

As opposed to performance improvements through periodic innovations, the concept of learning organization is based on continuous improvement at all levels and parts of the organization. The roots of the learning organization paradigm lie in the Japanese kaizen philosophy that relies on incremental improvements and daily small-scale activities. The ideas of kaizen were carried further in the theories of Total Quality Management (TQM), defined as a managerial innovation that emphasizes an organization’s commitment to the customer and to the continuous

improvement of every process through the use of data-driven problem solving approaches based on empowerment of employee groups and teams (Dean and Bowen, 1994). Based on the work of Anderson et al. (1994) and Waldman (1994), Westphal et al. (1997) have summarized the manifold theory of TQM to four basic aspects:

- Customer focus. Improvement of processes for both internal and external customers
- Continuous improvement
- Structured, problem-solving processes for identifying and solving problems and finding opportunities for improvement, modelled as the Plan-Do-Check-Act cycle (Deming, 1993)
- Employee empowerment. Continuous improvement is most likely to occur in groups of individuals who are provided with knowledge, skills, motivation and authority to take action (Crosby, 1984). Most of the knowledge to improve a product or service is thought to rest with those directly involved in producing the good or service, and this knowledge must be exploited (Juran, 1989).

Theories that see change as a process of learning and continuous improvement also emerged in management literature related to organizational change. As change is developing and unpredictable of nature, creating a learning organization is understood as a means to cope with the increasingly turbulent environment (e.g. Beer and Eisenstat, 1996). Continuous improvement is considered essentially a learning process as it necessarily requires first learning something new. In the absence of learning, change may remain cosmetic and improvements are either fortuitous or short-lived. (Garvin, 1994)

Organizational learning can be defined as the capacity or processes within an organization to maintain or improve performance based on experience (Nevis et al., 1995). Individual learning is imperative for organizational learning but not sufficient as such (Argyris and Schön, 1978; Marquardt, 1996; Mumford, 1994). Senge (1990) makes a distinction between adaptive and generative learning and accounts increasing adaptiveness only as the first step in moving toward learning organizations. At its heart, the impulse to learn is about being generative and creative (Senge, 1990). Sarala and Sarala (1996) define learning as a co-operative developmental activity by which existing modes of operation are either improved or quite new ways of action are created. Accordingly, Argyris (1993) divides learning to either single loop or double loop learning. Single loop learning is focused on how to execute current actions better, whereas double loop learning is more about setting the right targets and only then acting towards them. Double loop learning calls for deeper understanding: identifying a mismatch between the

desired and achieved results, and accomplishing the reconstructive actions. Double loop learning is not only better execution of tasks to achieve results based on the governing variables, but questioning even the targets set for the actions. As Sirkin and Stalk (1990) put it, the difference is in whether the organization is learning from problems or continuously fixing the same ones over and over again. Single loop learning is sufficient in routine-like, repetitive situations, whereas solving more complex problems requires double-loop learning. Both types of learning are needed in a learning organization and for any type of learning a common requirement is implementing the corrective actions in practice; just observing a problem and defining a solution is not enough. (Argyris, 1993)

A learning organization then has an enhanced capacity to learn, adapt and change. It is an organization in which learning processes are analyzed, monitored, developed, managed, and aligned with improvement and innovation goals (Gephart et al., 1996). Based on the different definitions that describe the characteristics of learning organizations (Argyris, 1993; Marquardt, 1996; Mayo and Lank, 1994; Senge 1990), Pankakoski (1998, p. 52) summarizes the features of a learning organization as a "systemic entity that has the ability to e.g.:

- Use the learning capabilities of its members to achieve common goals
- Create a supportive climate that aims at continuous improvements
- Encourage the members to critically question, correct and reform the ways of action
- Create, acquire and share know-how and continuously adapt and renew itself in response to the changing environment."

Nonaka (1988) views change, i.e. renewal, as a process of self-organization through chaos. He presents that self-renewal takes place irreversibly as existing knowledge is restructured to create new missions and domains for the organization, but it requires systematic incorporation of the opportunity for creating information beside daily work also at the employee level. For fostering creation of new information, it is more desirable for an organization to have coexisting countercultures than to be dominated by a single value. As conditions of the renewal process, the creation of new information should be promoted and finally organized into knowledge. Information creation is fostered by maintaining a condition of instability, selectively amplifying certain fluctuations with a core team and resolving discrepancies within an organization. (Nonaka, 1988)

Garvin (1994) states some more concrete ideas of how to achieve a learning organization. Learning organizations are skilled at five main activities: 1) systematic problem solving, 2)

experimentation with new approaches, 3) learning from their own experience and past history, culminating to recognizing the value of productive failure over unproductive success, 4) learning from the experiences and best practices of others, and 5) transferring knowledge quickly and efficiently throughout the organization for learning to be more than a local affair. As examples of experimentation Garvin mentions involving incentive systems that favour risk taking and launching demonstration projects that involve holistic, system wide changes introduced at a single site, but undertaken with the goal of developing new organizational capabilities. Characteristic for such demonstration projects is that they (Garvin, 1994):

- Are the first projects to embody principles and approaches that the organization hopes to adopt later on a larger scale. Thus involve mid-course corrections and considerable learning by doing
- Implicitly establish policy guidelines and decision rules for later projects
- Often encounter severe tests of commitment from employees who wish to see whether the rules have, in fact, changed
- Are developed by a strong multi-functional team reporting directly to senior management
- Tend to have only limited impact on the rest of the organization.

The first steps towards a learning organization are recognized as fostering an environment conducive to learning, opening up boundaries and stimulating the exchange of ideas and creating learning forums, such as strategic reviews, systems audits, internal benchmarking reports and delegations that are sent to study leading organizations around the world to better understand their performance and distinctive skills (Garvin, 1994).

As a summary, it can be stated that Organizational Learning theory suggests change implementation ideally to involve:

- Behavioural change as a result of observing a problem
- Carried out in all levels and by all members of the organization
- Constantly on-going process
- Accumulation of continuous incremental and individual changes.

4.6 Summary of the Theories

Summarizing how the different theories of organizational change contribute to change implementation is challenging, because rather than being a uniform model, each theory is a

collection of somewhat ambiguous concepts, guidelines and frameworks. Despite of the different viewpoint, the theories also overlap and complement each other. Due to the different origin of each approach, the main difference is related to the targeted outcome of the change. OD emphasizes employee well being along organizational effectiveness, whereas OT aims at large-scale change as a means of strategic management. BPR then concentrates on measurable performance improvements through business process change. The theory of organizational learning does not explicitly restrict its object of change, but aims at an adaptive and continuously renewing organization. Project management is also a generic theory for carrying out any temporary task that stresses the planning and control of the execution. The ultimate aim according to all the theories is anyhow improved business performance, and the variance stems from different assumptions of the means, whether it should employee empowerment, streamlined processes, ability to learn or something else.

However, the outcome of change is of secondary importance in this study as long as the change is beneficial, and the focus is on the process of reaching the outcome. Thus on the subject of implementation, OD highlights participative diagnosis of the improvement needs, careful planning of both the target state as well as the interventions for reaching it. The phase models describing the change process are a focal element, as well as the change agent role supported by top management. The theory of OT has grown from the critics of OD. The contribution of OT to the actual implementation consists of suggesting change initiation not based on a diagnosis, but on a strategic intent affected by external change. OT diminishes the importance of a change agent and stresses the role of line management in the change. In terms of the implementation process, the view of sequential process dominates also in OT, although many authors have called for a more adaptive and flexible process that facilitates learning in the uncertain conditions of today's business environment.

BPR theory views implementation rather similarly than OT, but more clearly relies on the phase models and holistic approach. While some authors in the field of strategic change (e.g. Mintzberg, 1990; Quinn, 1980) are extremely doubtful of making a complete and holistic definition of the target state as a detached task before implementation, holistic planning and implementation approach is the definite view in BPR. The BPR theory essentially views change as a project and supports the assumption of the traditional project management theory of being able to determine the target of the project in a detailed and exact manner at the start. Project management relies on planning, control and monitoring and considers a project successful when the execution and the outcome conform to the plan.

Organizational learning holds a fundamentally different view to change as it views change as a result of learning and thus change implementation as part of learning. Organizational learning emphasizes that change is carried out in all levels and parts of the organization while each member of the organization learns besides their practical work. As a means for coping in the constantly changing environment, the theory stresses the continuous and incremental nature of change. Rather than concentrating on controlling change, the role of management is to foster circumstances that support the organization members in learning and generating new ideas and knowledge.

5. CONCLUDING EXTANT THEORY OF IMPLEMENTATION

This chapter concludes what the presented theories state about implementing organizational change and provides a framework for analysing the empirical data. Figure 8 illustrates how the theoretical contribution to change implementation is concluded and how this chapter is structured. First, the research constructs are defined based on the presented change process types, planned and emergent, the theoretical basis of implementation (OD, OT, BPR etc.) and the researcher's practical experience in the case program. Next, the extant implementation approaches are concluded and defined using the research constructs and comparing the features of planned and emergent change with the theories of organizational change. Finally, a rational evaluation of the approaches is provided based on the different theories of organizational change.

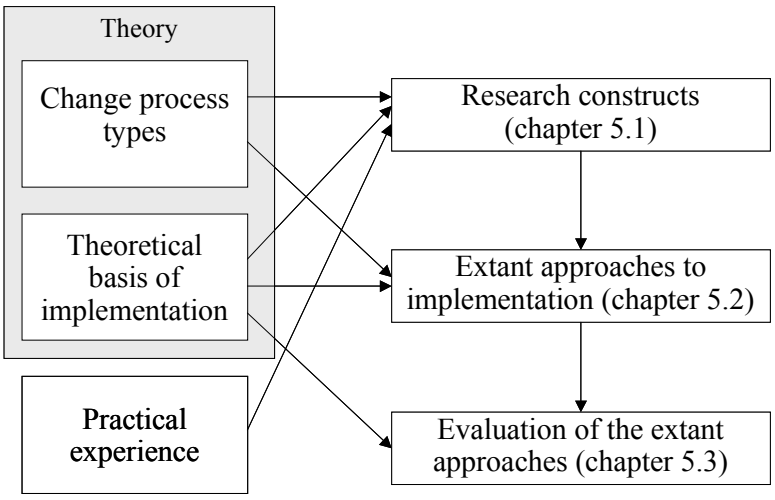


Figure 8. Concluding the extant theory of organizational change implementation.

5.1 Research Constructs

The research constructs are defined for the following purposes: 1) as a framework for concluding the theoretical contribution to organizational change implementation and 2) as the guidance for the case analysis and structure for the description. The constructs stem from two equally important sources: the review of the extensive, but dispersed theory of organizational change focusing especially on implementation, and the practical experience gathered during the case program. Based on the review of the different change process types and the theories on organizational change, their contribution to change implementation can be broadly divided into four main categories: *1) initiation, 2) management structure and 3) process of implementation*

and 4) change advancement, as will be demonstrated in this chapter. Change advancement refers to whether change is built up as incremental development during implementation or through implementing a complete solution throughout the organization at once.

The practical experience of the case program also indicated that the uniqueness of the implementation was related to topics like: how the change was motivated, how the responsibilities were shared among the global and local members of the program organization and how they collaborated, how schedules for the future were left open and how the content of change developed along the implementation. These topics comply with the four categories identified in the theory, which thus form the research constructs of this study that indicate the essential elements of implementing organizational change. This chapter presents the constructs and summarizes the characteristics attached to them in the theories.

5.1.1 Initiation

Perceived need for change is considered one of the most important conditions for successful change (Kotter, 1995; Burke, 1987; Ackerman, 1982) and thus a prerequisite for implementation initiation is having clear reason and target for the change[4]. The need may arise from defects in the existing organization or the appeal of the target state. In line with the planned approach to change, OD, BPR and project management theories all view change to be initiated proactively and internally by designing a comprehensive and uniform *vision* of the target state. The importance of a vision and visionary leadership is widely shared in the theory of organizational change (e.g. Kotter, 1995; Beer et al. 1990a; Pettigrew, 1985; Tichy and Ulrich, 1984). Vision provides a picture of the future and shows how the members of the organization will fit into that future (French and Bell 1999). Thus, a good vision shows the direction for development (Lanning, 2001). Kotter (1996) describes how the most successful change efforts begin with a hard look at a company's competitive situation, market positions, technological trends and financial performance and claims that in every successful transformation effort there is a picture of the future that is relatively easy to communicate and appeals to the stakeholders. In OD the target state is based on the diagnosis of the organization, in BPR it consists of the target process design and in projects it is the explicit goals of the project. Organization transformation also mainly relies on an explicitly formulated strategic vision as the impetus for change, although the vision is triggered or at least greatly affected by changes in the external environment.

[4] Based on the scoping of this study, the actual definition of reason and goal of organizational change are not considered as part of implementation, but as a prerequisite for it.

By contrast, the point of view in the theory of organizational learning is that change implementation is a response to an *observed problem or opportunity* (Argyris, 1993; Nonaka, 1988) rather than implementation of some designed target state. In a learning organization, the role of a vision is merely to set the direction for the change, but not to act as the main cause of change implementation, so change initiation according to organizational learning theories complies with the characteristics of emergent change. In the theories, implementation initiation is thus characterized either by a common vision designed by the organization itself or observed concrete problems and opportunities.

5.1.2 Management Structure

In a learning organization, the whole organization is responsible for initiating and implementing changes as suggested also by the emergent change approach. Quite the contrary, the other approaches rely on top-down management and the power of committed top management or change agent and thus promote a *centralized* management structure like the approach of planned change, although the need to motivate people through involvement is recognized both in OT, BPR and project management theories and especially in OD. The emphasis that many authors (e.g. Salminen, 2000; Kotter, 1996; Beer and Walton, 1987; Anderson et al. 1985) place on the leadership of change implementation implies support for a centralized management structure as a means for gaining control and focus, which are considered important for ensuring that the effort really has an effect on the performance of the company, and for creating order in the middle of the chaos of change (Schaffer and Thomson, 1992; Denton, 1996; Moran and Avergun, 1997).

On the other hand, Beer and Eisenstat (1996) claim that even when the need for a new strategic direction is perceived at the top, too often companies employ top down programs in which the inability to create an organization capable of implementing it is a serious barrier. Therefore, Kanter (1983) and Burke (1985) suggest that the key to the leadership formulations is that leaders empower others. Levine and Mohr (1998) further define that successful implementation is most likely when the people who do the work are the ones engaged in the redesign. Their argument is derived from the traditional rationale according to which people support what they help to create and the diversity of knowledge mobilized through large-scale involvement leads to greater creativity and innovation (Bunker and Alban, 1997). In his review of many research findings from the 1940s to the late 1970s, Nadler (1981) also concludes that participation in the change tends to reduce resistance, build ownership of the change and thus motivates people to

make the change work. Salminen (2000) emphasizes participation with real decision-making and characterizes participation in planning as representative involving a limited number of members from every important interest group, whereas participation in implementation means that the members of the changing organization take part in bringing the new solutions to use.

Building on the arguments of the importance of employee involvement, the theories of organizational change go further and propose a completely different management structure in change implementation: corrective actions are initiated and taken *locally* close to where the work is done. Sashkin's (1985) suggestion for effective leaders to give away power to achieve goals through others and not to dominate them supports the local management structure. Organizations with fluid job descriptions, loose organization charts, high communication and few rules have also been found to be conducive to innovation, because they free developers from constraints, allowing them to change flexibly and create novel ideas (March, 1981; Peters, 1994). Senge (1990) supports the view of a local management structure with his notion that the old model "the top thinks and the local acts", must give way to integrating thinking and acting at all levels. Nadler and Tushman (1989) also encourage developing leadership for change throughout the organization.

Beer et al. (1990a) conclude that the top-down approach holds a promise of producing rapid change toward an elegantly conceived end state. However, employee commitment to the newly aligned organization may be low, and employee knowledge of how things get done may not be considered in the solution. A bottom-up approach allows, even demands participation by employees, which seems to address many of the failings. But, change may be too slow and ill defined to respond effectively to short-term business demands and the top management's perspective and knowledge may not become adequately incorporated into new solutions.

5.1.3 Process

Concerning the change implementation process, OD, OT, BPR and project management theories seem to follow the same pattern. Despite of the critics to the phase models and the demands for a more flexible approach, a *linear* process that has a clear start and end and consists of pre-defined phases dominates the theories. Although the phases may overlap, they should still be performed in the specified order and not be reversed. The phase models as a core characteristic of planned change resemble the project life cycle and thus imply that change implementation is a project with a clear start and end.

As an argument for the sequential process, Burgess (1998) claims that the most successful re-engineering projects involve careful planning of the approach to be taken, with realistic milestones. Kotter (1995) further advises that none of the eight steps of his model for transforming an organization should be skipped. Bullock and Batten (1985) claim that in a good model the phases must be linear, i.e. the sequential ordering of the phases should never be reversed, but they do agree that a phase description must incorporate fluidity so that the phases can overlap and interconnect. Burke (1982) agrees that although it is useful for understanding change to conceive of distinct phases, in actual practice they blend and overlap.

As a contrast, organizational learning - in line with the approach of emergent change - does not view change as a project at all, but instead as a *continuous* process that forms a constant cycle. As opposed to arguments for the sequential process, some research clearly argue that change does not obey the linear, phased plan of a manager or consultant and that the pre-programmed phase models may be unrealistic (Beer and Walton, 1987). McLean et al. (1982) note that despite of the heavy use of the planned change model it often breaks down, for example because a phase results in insufficient data for action and cycles back to data collection. Also a number of other authors have challenged the extent of the domain within which the linear approach to change may be effective (e.g. Mintzberg, 1978; Pasmore, 1994; Pettigrew, 1985; Tosey, 1993).

DiBella's (1996) findings indicate how culture at multiple levels of analysis (group, organization, society) led to deviations in how change plans were implemented. As a part of the dynamic process of change, managers should thus continually monitor the meanings, which people give to change and not block adaptations. If a project proceeds through a sequence of lock-steps once started, it is difficult to adjust in the middle of the project to changing conditions, for example in markets and technologies (Brown and Eisenhardt, 1997). Burns and Stalker's (1961) "organic" organizations, Lawrence and Lorsch's (1967) successful plastic firms and Mintzberg's and Water's (1985) "adhocracies" are favoured exactly because of their adaptive capacities.

5.1.4 Change Advancement

The starting point in planned change is a *holistic* and complete solution that is to be brought in practice. OD and BPR, as well as most of the theories of OT also suggest that the best way to start a change effort is to make as comprehensive description of the target state as possible. Implementation then is about executing the necessary actions required for reaching the state.

These theories also support changing all the required subsystems simultaneously due to the interrelationships between them.

According to Burgess (1998) a successful BPR project is defined broadly and tackle most of the critical activities in the organization to enable the desired impact upon overall performance. Hall et al. (1993) agree that in BPR, process breadth is important, because if a process includes interrelated activities, a company may identify additional opportunities that would not surface in a single-function performance improvement effort. Identification of the appropriate strategic and organizational change is considered to come from diagnostic thinking – analysing the organization in its environment, understanding its strengths and weaknesses, and analysing the impact of anticipated changes. The most effective orientations are accounted to include a fully developed description of the desired future state, although it is difficult to predict or define exactly what a future state will be (Nadler and Tushman, 1989). On the other hand, some authors of strategic management (e.g. Mintzberg, 1990) and transformational change (e.g. Cummings and Huse, 1985) also note that in a turbulent environment the uncertainty present may also require learning along the change, which limits the possibilities of having a complete solution for implementation. Likewise, Beer and Eisenstat (1996) claim that the interdependence of various organizational design elements accounts for the failure of uni-dimensional interventions.

As an alternative to the holistic view, change advancement is seen as *incremental* in the theories of organizational learning where the idea is to implement the required change as a problem is observed. The implication thus is that change is an accumulation of incremental improvements throughout the organization as suggested also by the emergent approach. Reger et al. (1994) make a point that change efforts are often aborted, because executives are unable to transform the entire organization all at once when the initial effort meets opposition and falls short. Quinn's (1980) logical incrementalism describes how managers make plans that work imperfectly and attract a great deal of attention, disagreement, and support. The response of the system then affects and redirects the plan.

Similarly, Brown and Eisenhardt (1997) describe that successful managers explore the future by experimenting with a wide variety of low-cost probes. To support learning by doing, pilots function for testing and redefining the redesign as well as its implementation. Beer and Walton (1987) also propose that change is brought about by continually readjusting direction and goals, which places more stimulus on what Eisenstat (1984) has called behavioural learning (through

doing) as opposed to representational learning (through language). According to Reger et al. (1994), even within a single corporation, implementation must be tailored to the specific identity of each division or department. An approach proved successful in one division may be resisted in another one. On the other hand, diversity of organizational identity beliefs creates leverage or entry points where change can be implemented with relative ease. Nadler and Tushman (1989) promote small-scale efforts to experiment with the changes in a bounded manageable setting and to see whether change will really work in "our unique setting". Beer et al. (1990b) conclude that "grass-roots" change presents senior managers a paradox of directing a "nondirective" change process. Instead of mandating corporate renewal from the top, the successful senior managers specify the general direction in which the company should move without insisting on specific solutions.

5.2 Planned and Emergent Approaches to Implementation

Planned and emergent change were presented in chapter 3.3 as the distinct change processes. Using the research constructs of change implementation, it can be concluded that the planned and emergent change processes also represent fundamentally different approaches to implementation, as presented in Table 9.

	Planned implementation	**Emergent implementation**
Initiation	Initiated proactively by designing a *vision* of the target state	Initiated responsively based on an observed *problem or opportunity* in any level of the organization
Management structure	Managed, controlled and executed by a *central* organization distinct from operative work	Changes integrated into normal work activities and thus carried out *locally* where the need observed
Process	Carried out as a *linear*, sequential process	Carried out as a *continuous* process
Change advancement	Based on a *holistic* and comprehensive solution	Based on the accumulation of *incremental* improvements

Table 9. Definitions of the planned and emergent implementation approaches.

Next, the implementation approaches suggested by the various theories of organizational change – OD, OT, BPR, organizational learning and project management – are summarized in Table 10 using the elaborated research constructs. The summary reveals that the contribution the various theories make is rather a confirmation of the validity and theoretical relevance of the two alternative implementation approaches, planned and emergent, than something essentially new

or different. Thus, in addition to summarizing the theories according to the research constructs, Table 10 reflects them with the planned and emergent implementation approaches, the features of emergent approach highlighted with grey colour.

Planned **Emergent**	**Organization Development (OD)**	**Organization Transformation (OT)**	**Business Process Reengineering (BPR)**	**Project Management**	**Organizational Learning**
Initiation					
Designed vision Problem or opportunity	Designed descrip-tion of the future state as a result of a diagnosis of the organization.	Vision based on strategic need, often due to external changes.	Process redesign derived from strategic vision and motivated by (measurable) performance improvements.	Explicitly defined project goals.	Behavioural change as a result of observing a problem.
Management Structure					
Central Local	Managed by top management and external change agent that involve	Lead centrally by top management.	Strong leadership and participation to overcome change resistance.	Managed centrally by project manager and supported by project sponsor.	Carried out in all levels and by all members of the organization.
Process					
Linear and sequential Continuous	Sequential process defined in a plan made in the beginning of implementation.	Sequential process dominant, although more responsiveness called for.	Sequential process.	Sequential process defined and controlled by a project schedule.	Constantly on-going process.
Change advancement					
Holistic Incremental	Realization of a complete description of the future state that is a pre-requisite for implementation.	Involves most parts and elements of the organization at once.	Holistic design of optimal, cross-functional business processes and related organizational elements.	Directed by complete hierarchy of goals and tasks.	Accumulation of continuous incremental and individual changes.

Table 10. Summary of extant theory of organizational change implementation.

The summary verifies that the theories of organizational learning represent the emergent approach to change implementation, whereas OD advocates planned change, as has also been

noted by e.g. Burnes (1996) and Dawson (1994). The dominant views of organization transformation also support the planned approach to change, although a growing number of studies claim its rigidity in the uncertain and dynamic conditions. Although there is extensive theory concerning BPR as a distinct form of organizational change including specific models for implementation, it can be concluded based on the presentation of the various approaches that there is not much difference in implementing business process change compared to any other strategic organizational change. While being rather uniform concepts, the theories of BPR and project management most consistently comply with the definition of the planned change approach.

Reducing the manifold theories of organizational change to the four dimensions and the two distinct approaches somewhat simplifies the issue and ignores to some extent the contemporary findings that manifest how additional elements and viewpoints should be involved in any of the presented theories. The more recent theory of OD calls for flexibility to the sequential phase models, strategic transformation theories including BPR recognize the importance of organizational learning as part of the effort and project management theories acknowledge the specific nature of organizational change projects that involve a high degree of uncertainty. However, despite of the imperfection and simplifications of this framework, it can be presumed to provide a basis for creating further understanding of change implementation through the practical case. The usefulness of the framework remains to be seen when concluding this study.

5.3 Evaluation of Planned and Emergent Approaches

In this chapter, the stand that the planned and emergent approaches take on implementation is judged. The characteristics of the approaches are evaluated summarizing the reasoning for the differing views: for example, what is the theoretical basis for proposing implementation to be initiated by a designed vision or change to be built up incrementally. However, all the reasoning already presented in chapters 3 and 4 will not be repeated here.

Related to change initiation, Nadler and Tushman (1989) state that visions are developed for a number of different purposes. They are directional, signalling where the reorientation is headed. As well they are symbolic providing a point for rallying and identification, educational, energizing and help individuals to understand the events around them. (Nadler and Tushman, 1989) In addition, the parameters of the overall vision, even if they are broad, constrain the actions taken as part of the change (Kotter, 1995). In contrast, Beer et al. (1990b) describe how in their research the more successful transformations usually started at the periphery of the

corporation. General managers of individual units lead the change by creating ad hoc organizational arrangements to solve concrete business problems instead of focusing on formal systems and structures. They claim the typical "off-the-shelf" standard solutions to be irrelevant as they fail to meet the individual needs of different sub-units. Also Stace and Dunphy (1994) warn of generic-style interventions and advise to customize and internalise the interventions by the organization so that they add value to the customer. Yet it has been noted that autonomous or "grassroots" change formulation and implementation may potentially lead to loss of focus and dilution of limited resources (Liedtka and Rosenblum, 1996).

Centralized, hierarchical organizing of a change effort is favoured as it is considered useful for co-ordination as well as control (Pasmore, 1994), which according to Salminen (2000) is one of the most important success indicators of change implementation. Findings from a research related to new product innovation (Brown and Eisenhardt, 1997) also emphasize the importance of cross-project communication, which implies of the synergy benefits of central co-ordination as does Hammer (1990) in his note of eliminated redundancy as a benefit of centralization. Stjernberg and Philips (1993) also note how directive approach to change ensure that things get done in the change effort, but on the other hand, the effects of the actions may work against the participatory goals of the initiative. Beer et al. (1990a) summarize the drawbacks of a centralized management structure as low employee commitment and the ignorance of the practical knowledge of how things get done in the organization and claim that a bottom-up approach that allows and even demands participation of employees seems to address many of the failings of unilateral top-management direction (see also Pasmore, 1994). Hammer (1990) agrees that decentralizing a resource (whether people, equipment or inventory) gives better service to those who use it, but at the cost of redundancy, bureaucracy, and missed economies of scale.

Considering change implementation as a linear sequence of phases is such an established and dominant view (e.g. DeCock and Rickards, 1996; Bullock and Batten, 1985) that it often seems to be taken for granted without providing much explicit reasoning of the benefits. DeCock and Rickards (1996) agree that the linear approach can act as a binding mechanism and a source of psychological security in managing change. Systematic and motivation based project control also ensures that everything progresses as planned, whereas not having systematic project control and project management tend to cause difficulties in reaching the goals (Salminen, 2000). Burgess (1998) notes that although it is important that companies spend time planning the projects, they must also be prepared for the unexpected and arrange contingency plans. In

general, there is much praise of firms that can be responsive to uncertainty in their environments, particularly when environments are dynamic (e.g. Miller, 1982).

Considering successful change as holistic is as well dominant in the theories of organizational change. According to Burgess (1998) a successful BPR project is defined broadly and tackle most of the critical activities in the organization to enable the desired impact upon overall performance. The most effective orientations are accounted to include a fully developed description of the desired future state (Nadler and Tushman, 1989). Likewise, Beer and Eisenstat (1996) claim that the interdependence of various organizational design elements accounts for the failure of uni-dimensional interventions. However, Reger et al. (1994) point out that since every organization has a unique identity, implementation begins and proceeds at varying paces across organizations and initial successes encourage additional changes. Another claim to support the incremental way of change is that aiming at a complete design to start with does not enable learning by doing, which is claimed to be the primary way of learning in a fast changing environment (Eisenstat, 1984; see also Boulden and Lawlor, 1982).

Table 11 summarizes the evaluation of the planned and emergent approaches to change by presenting the main strengths of each approach. The weaknesses are not explicitly presented as they typically count as the negations of the strengths of the alternative approach: for example, initiating change as soon as a problem is observed may easily lead to lack of focus and common direction; a centralized management structure is not ideal for exploiting knowledge on operative activities and local context, nor gaining employee commitment; linear and sequential process has the drawback of not being responsive to changing conditions and building up change incrementally as an accumulation of individual smaller activities may risk the consideration of the interrelationships between the various small changes.

	Planned change	Emergent change
Initiation	Designed vision: • Common direction • Focus	Problem or opportunity: • Relevance • Concreteness
Management structure	Central: • Control • Synergy	Local: • Exploitation of knowledge on operative activities and local context • Commitment of employees
Process	Linear and sequential: • Systematic • Guides to action	Continuous: • Responsive to changing conditions
Change advancement	Holistic: • Consideration of interrelationships (eliminates sub-optimization)	Incremental: • Learning through incremental changes • Enables partial solutions

Table 11. Main strengths of the planned and emergent implementation approaches.

6. CASE STUDY

The case study concentrates on Nokia Networks' business process change program called BIRD, which involved implementation in numerous organizational units. Measured by the focal performance indicator used, the case study demonstrates successful change implementation: the overall inventory rotation days' value (IRD) in the respective area decreased about 50% during the two years of the BIRD program. The improvements in the most successful local implementations count as high as 80% decrease from the original inventory value. Before a more detailed analysis of the program success in the end of this chapter, the aim of this case study is to understand what happened.

The case is structured and analysed based on the elaborated research constructs that indicate essential elements of implementation: initiation, management structure and process of implementation and change advancement. Thus, the case study aims at answering the following questions concerning the case program: how was implementation initiated? what was the management structure of the implementation effort like? how was the implementation process? and how did the change advance during the implementation? In addition to presenting the case evidence, some reflection with the existing implementation approaches, planned and emergent, is presented already in this chapter.

6.1 Introduction to BIRD Program

The BIRD program aimed at improving customer satisfaction and productivity through implementing more efficient processes for the supply chains. BIRD focused on Nokia Networks' (NET) European customers and the largest division at the time, which formed a significant part of Nokia Networks' sales. The new processes were implemented for 37 customer projects in 20 different European countries within two years by the end of year 2000. The actual implementation of the changes was carried out locally in each country and separately for each customer case. The local implementations are referred to as cases A-X in the case description. A summary table of the cases is presented in Appendix B.

Nokia Networks, the second biggest business group of Nokia corporation, provides systems and infrastructure for telecommunications networks. Nokia is headquartered in Finland, but operates globally in all continents of the world. The yearly net sales of Nokia Networks summed up to 4 390 Million Euro in 1998 at the start of the BIRD program and increased to 7 714 Million Euro

by the end of 2000. In the end of 1998 NET employed 20 638 people globally, and this increased to 23 965 by the end of 2000. Further in the case description, Nokia refers to Nokia Networks (Nokia Annual Reports, 1998 and 2000).

Nokia Networks offers switching, transmission, network management and intelligent network solutions, both the equipment and the services needed for building and maintaining the networks. Mobile networks make up the main volume of the sales. A mobile network consists of switches, base station controllers (BSC) and base transceiver stations (BTS), all referred to as network elements. The switches form a so-called core network, whereas the BSC and the BTS's connected to it form a base station subsystem (BSS). BTS is the element interfacing with a mobile terminal and by far the most numerous elements in the network.

During the BIRD program, NET was organized in divisions that were responsible for developing, marketing, manufacturing and delivering a group of products. The divisions were further divided into product lines responsible for a more specific set of products. The BIRD program and thus this study focused on three product lines of the largest division, responsible for 1) BTS, 2) the transmission radio connecting the BTS's and BSC's and 3) the antennae, power supplies and other auxiliary equipment needed along the BTS. During the program time span, the responsibility of manufacturing and delivering products was concentrated from the individual product lines to a NET-wide unit that became responsible for the production and logistics of all products. Besides this product operations unit, another unit called customer operations was responsible for the customer interface. Customer operations included the cross-functional *account teams* that served specific customers and were located in sales offices throughout the world close to the customers. In addition to the sales and customer deliveries, the account teams were responsible for building and maintaining the network for the customer, if the business case involved such service. The unit inside customer operations that was responsible for the network building projects was called *customer services (CS)* and the term project manager further in this text refers to the manager responsible for the network-building project, whereas *project* and customer project refer to building a defined part of the network for an operator customer according to a contract.

The process of building a network starts from network planning that produces the approximate number and location of the network elements required in the network as well as the connections between them. The locations including the elements installed in it are called *sites*. The next phase is to acquire the exact site by negotiating a lease agreement with the site owner. Then, the

construction of the site is designed and a specification of the exact products to be installed is prepared. The outputs of the design are the drawings of the site and a kind of bill of materials and equipment, referred to as *product configuration*. Based on the design, the necessary permits that vary in each country are applied for from local authorities. When the permits are granted, the construction of the necessary foundations, antenna masts and power supplies can start. After the site construction, telecommunications implementation takes place. The BTS, antennae and other auxiliary equipment are installed and the site is integrated to the network either using a line in a fixed network or a transmission radio link. The process of building a site is called *site process* that is illustrated in Figure 9. The duration of the site process typically varies from several months to a year.

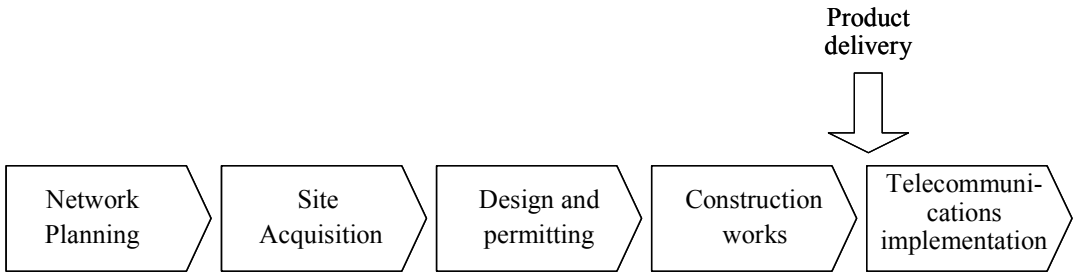


Figure 9. Site process.

The Nokia products are needed at the site for telecommunications implementation. The starting point in the beginning of the program was that product lines delivered the products to a local warehouse, from where they were delivered to a site. In some cases the products delivered to the warehouse were dedicated to certain site, in some cases not. The problem in the process was that long and varying delivery times of the products and the uncertainty related to the site process progress had resulted in high inventories in the countries for ensuring the timely build-up of the network. And yet, even the high inventory levels did not guarantee the availability of the right products in the right place at the right time. A concrete objective of the BIRD program was to reduce the country inventories by first implementing the most suitable of the defined basic supply chain structures, and later to gradually develop all supply chains towards direct deliveries of full product configurations to installation sites. The original alternative supply chain structures were: 1) customer-specific kanban-controlled *buffer* of units that could make up any needed end product configuration, and 2) *direct delivery* of final product configurations to installation sites, either from a single manufacturing plant or via a gateway where deliveries from several plants were merged as one. Later, 3) *Regional Distribution Centre (RDC)* that was

a non customer specific buffer of units serving numerous customers relatively close to them, was added as a third alternative supply chain structure.

Building a mobile network means a business relationship of several years between the customer and supplier, one reason being that it is not possible to connect base station controllers and base stations from different suppliers, although the switches can be openly combined with any base station controller. The scope of a customer project is always different: the size of the project, the product scope and the scope of services concerning the site process vary. Roughly, the customers can be divided to the following categories: box, telecom implementation and turnkey. For box customers, Nokia delivers only products and the customer is responsible for the site process. In telecom implementation, Nokia delivers products and has the responsibility of telecommunications implementation phase of the site process. In turnkey projects Nokia is responsible for the entire site process. Inside the categories there is still a lot of variation and the bottom line is that each customer project is a unique business case. The uniqueness of each case, among other reasons, had resulted in a lot of variation in the processes applied by the account teams and thus more consistent processes across the teams was one of the objectives in the BIRD program.

The customers traditionally used to be experienced state owned network operators, but in the past years new mobile operators with no telecommunications background had entered the market. Thus, the focus of Nokia Networks' business had been shifting from selling the equipment to delivering a value-added bundle of equipment and services, for example by taking more responsibility of the network planning and building in a project (Nokia Press Releases, January 04,1999; April 21, 1999; July 28, 1999; January 07, 2000 and February 03, 2000). At the same time, the industry was becoming more mature and the high-technology equipment were evolving towards commodity products bringing about the need for increased productivity. In addition to the traditional competitors in telecommunications industry, the new benchmarks were set by the agile corporations in the PC industry. Therefore, especially with the new types of customers, it became increasingly critical to manage the supply chains efficiently. Based on the development in the customer base and the market, the strategic intent to radically reduce inventory levels was set as one of Nokia Networks' breakthrough objectives for 1999 – to be implemented without risking the target of providing the fastest time to profit for the customers.

6.2 Implementation Initiation in BIRD

Program Initiation

As evident based on the introduction of the case program, the need for change was retrieved directly from the breakthrough objectives. Nokia Mobile Phones (NMP), a sister business group of Nokia Networks, also provided a benchmark for how improved supply chain processes could bring about a distinctive competitive advantage through operational efficiency (e.g. Häikiö, 2001). Establishing the BIRD program as the means for change was also affected by the positive experiences gained from a similar type of effort in NMP where a successful supply chain development program had been implemented in one of its regions, applying the so-called microcosm approach (Hoover et al. 1996) that was to be the basis also in the BIRD implementation approach. A microcosm is a miniature version of the company as a whole, a complete slice of the business from raw materials to customer delivery. The fundamental idea of the approach is that change is launched by designing, testing and implementing radically improved structure in a microcosm within several months and covering successively larger parts of the whole business through waves of microcosms. Implementation is carried out by microcosm teams with line representatives from all key activities, which are allowed to discover their own solutions within a common guiding framework and charged with creating real economic value. Besides the fairly autonomous microcosm teams, some centrally managed initiatives usually prove necessary. (Hoover et al. 1996)

Based on the strategic intent, the BIRD program was launched in the beginning of 1999 by the European (EMEA) area and logistics management. In addition to inventory reduction, another ambitious target of the program was to provide the operator customers the fastest time to profit from their network when having Nokia as the supplier. The purpose of the program was expressed in the following ways:

- Setting the twofold goal of increased productivity along with customer satisfaction
- Providing benchmarks of inventory rotation metrics in PC and telecommunications industry that clearly highlighted a big difference between Nokia and the best-in-class companies (inventory rotation days is a commonly used indicator for supply chain efficiency, which measures the average number of days that products stay in inventory)
- Stating a quantitative target for Nokia Networks' Inventory Rotation Days (IRD) by the end of 1999, which was approximately 40% lower than the value at the time of initiating

the program. (IRD is the specific indicator for inventory rotation used in NET including both the physical stock, goods in transit and the work in progress at sites). In addition to the IRD target, the potential cost savings due to the reduction were communicated.

- Visualizing the intended change in the chain as illustrated in Figure 10.

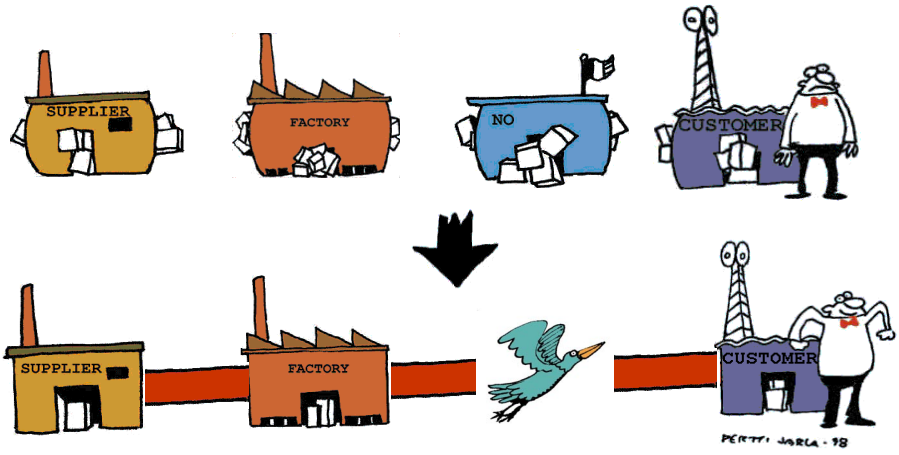


Figure 10. Visualization of the intended change (extract from BIRD Program Communication Set).

Earlier development efforts carried out 1997-1998 by the largest product line of Nokia Networks together with several of its customers served as a foundation for defining more concrete objectives for the BIRD program as the means for reaching the primary business benefits. Based on the past, and on-going development efforts, it was decided that the efficient and flexible demand-supply chain is to be reached through implementation of new processes where inventories are replaced by the high performance of the supply chain. In addition to the new processes, the change would be supported by implementation of logistics metrics and revised contractual terms between Nokia and its customers.

Initiation of Local Implementations

Initiating local implementation was mutually agreed by the program management and the local account team to fit the objectives and timing to the overall situation of the account team and the customer. Issues like on-going or coming contract renegotiations with the customer, the phase of the network building project, launches of new products and the local motivation for making the changes affected when and how the local implementation was initiated. When initiating an individual, customer specific implementation, the strategic purpose for the changes was

naturally valid. However, reducing the inventories was not considered the most critical issue by all stakeholders of each account team, so other aspects locally more important could be embedded to the implementation to make it more relevant. Table 12 presents how each of the local implementation was initiated in relation to the local situation.

	Local situation when initiating the implementation
Case A	The case was the first large-scale turnkey project, and as there was no global model for delivering products for turnkey project, there were problems in getting the products at site. BIRD was the means for solving the problems.
Case B	The standard IT system was decided to be implemented in the account team. BIRD implementation supported the IT system implementation by providing guidelines for the processes.
Case C	Contract renegotiations were started with the customer shortly before the implementation due to huge inventories tying capital. BIRD implementation was the means to carry out the related operational changes to enable the short lead times required and ensure that the changes would be in-line with the global guidelines.
Case D	Direct deliveries of BTS had been implemented by the local logistics prior BIRD implementation to increase cost efficiency, but the integration of the supply chain to customer's and Nokia project's site process had been ignored, which caused problems, for example extra visits to sites that were not ready for telecommunications implementation. BIRD implementation was motivated as the means to improve the co-operation between logistics, project and customer and to integrate the supply chain with the site process.
Case E	The case was a starting, extensive and challenging turnkey project. BIRD implementation was planned and targets were set according to the schedule of the network-building project. BIRD implementation was welcomed as support for setting up the project including logistics, which anyhow needed to be done.
Case F	A new turnkey project with the same project manager as in the pilot case A. There was will to apply the same processes as in the pilot case, and BIRD implementation was considered as a means to convince the rest of the local organization of the new processes.
Case G	Customer was expanding its own organization and changing its own processes for taking more responsibility of the site process for itself. BIRD improvements fitted well with the situation, as there was anyway a need to redefine the site process and integrate it with the supply chain, for which BIRD provided solutions.
Case H	There was a prospect to extend the network-building project from one part of the country to another. BIRD implementation initiation was started along with the new project phase.
Case I	Contract amendments under discussion included a commitment for a shorter lead-time and on the other hand more reliable orders from the customer. Replacing an existing product with a newer one affected the targets and the schedule of the implementation
Case J	The case was a starting project where the project manager was willing to obey standard processes, concerning both the site process and the supply chain. BIRD implementation was a means for implementing the standard supply chain processes.
Case K	The business was expanding with the customer, but the local logistics wished to manage also the growing number of deliveries without a warehouse. BIRD processes provided a solution, which fitted well also with the customer's expectations.
Case L	BIRD implementation was carried out locally based on the discussions between the local logistics and the customer.
Case M	The timing of BIRD implementation was aligned with contract negotiations.
Case N	The case was a pilot for electronic ordering (e-business), so BIRD was implemented along to support the new IT solution with solid processes.
Case O	Customer considered the lead times too long, which was due to longer lead times from one of the product line delivering the auxiliaries. BIRD was a means to gain consistent and shorter lead-time

	for all products.
Case P	Despite of the high inventories, express deliveries and special arrangements had been needed to support the network-building project. BIRD implementation was a way to achieve good service level with better cost efficiency.
Case Q	The local logistics was willing to get rid of the locally managed products to enhance efficiency. BIRD implementation was used for fulfilling the specific local need.
Case R	Customer was satisfied with deliveries to customer's own warehouse, so no need for major changes. Possibility to enhance customer's chain efficiency with direct site deliveries sustained as an asset for future negotiations if the customer would become motivated to the change.
Case S	The case was a pilot for another logistics development project. BIRD implementation was aligned to support the pilot.
Case T	No specific issues affecting the initiation.
Case U	The supply chain efficiency was improved for enhancing the contractual terms for the new phase to be started after the BIRD implementation; capability for faster deliveries was perceived as an asset for coming negotiations.
Case V	A new starting project where BIRD implementation supported the set-up of the project and logistics.
Case W	No specific issues affecting the initiation.
Case X	BIRD implementation was a solution for the very high inventory levels in the local warehouse.

Table 12. Effects of the local situation in the initiation of the local implementation.

To further increase the relevancy of the change, also the quantitative targets were modified to reflect what the change in the local account team really was about. The potential supply chain performance in terms of inventory levels and rotation, as well as lead times, was highly dependent on local conditions: the contractual terms between Nokia and the customer, selected supply chain structure (direct delivery or local buffer and later RDC) and the range of products and services used for the network, as some products had more stable demand than others and extensive responsibility of services typically resulted in a different invoicing scheme. Thus, it was unrealistic to expect all the customer contracts to be renegotiated as identical or the product range to be completely standardized during the change effort. So, although there was a global target value for IRD and later also for other measures like lead time, they were not directly applied as the local target, but the local targets were separately defined taking into account the local conditions. In the cases where the factors mentioned above were considered favourable for the supply chain efficiency, the targets were more ambitious, whereas in other cases more modest targets were accepted. Important was that the targets were commonly agreed by the stakeholders and they were challenging enough to effect change, but not unrealistic considering the local context.

Table 13 below presents the target IRD values of the individual implementation cases for which the data were available. The IRD target is presented in relation to the global target, e.g. global

target of 100 and local target of 53 equals to 53%. Having clearly more ambitious targets in BIRD implementations than the global target was due to the fact that the global target was generic for all products, and although BIRD involved a significant part of the business, some products were out of the program scope and they were typically the ones with slower inventory rotation.

The local inventory rotation days (IRD) target in relation to the global										
Case A:	53%	Case F:	-	Case K:	13%	Case P:	25%	Case U:	25%	
Case B:	70%	Case G:	25%	Case L:	-	Case Q:	13%	Case V:	-	
Case C:	23%	Case H:	50%	Case M:	-	Case R:	-	Case W:	25%	
Case D:	25%	Case I:	25%	Case N:	-	Case S:	-	Case X:	13%	
Case E:	53%	Case J:	-	Case O:	35%	Case T:	-	-: data not available		

Table 13. Ratio between the local and global IRD target.

In addition, the concrete changes needed for reaching the targets of each implementation were agreed in the initiation phase of each implementation. Understanding of the specific elements of the local implementation was gained by analysing the situation and business case according to an account analysis form, the content of which is described by Appendix C. The analysis was carried out in collaboration with the local account team members and BIRD program management. By comparing the starting point in the account with the targets of BIRD, the concrete changes to start with could be determined. Examples of the concrete changes identified at the initiation are listed in Table 14. However, in addition to the initially identified changes, new requirements were often encountered during the implementation.

	Concrete changes identified at the initiation of implementation	
Case D	• Postpone customer ordering to a later phase in site process • Order of complete site package instead of separate orders to product lines • Shorter product lead time • Handling of drop-off points (facilities close to the final site appropriate for keeping the equipment temporarily, i.e. 1-2 days, until the installation team picks up for installation to the site)	• Integration of invoicing and site process • Replacing local emergency buffer with express pipe • Replace old demand planning tool with the new one
Case G	• Postpone customer ordering to a later phase in site process • Standardization of locally managed items	• Order of complete site package instead of separate orders to product lines • Drop-off point locations
Case H	• Timing of internal ordering • Decrease of lead time by defining fixed schedule for activities • Ordering modules instead of units	• Timing of invoicing • Sizing of the local buffer • Changing country warehouse to a kanban-controlled buffer
Case I	• Order of complete site package instead of separate orders to product lines • Delivery of complete site package from RDC, shorter lead time • New way of communicating between the installation team and logistics • Switch from the existing transmission radio to a new one • Logistics partner operations	• Standardization of third party products with customer • Switching locally managed products to global ones • Buffer level definition for remaining locally managed products • Changing existing warehouse to kanban-controlled buffer for locally managed products
Case K	• Timing of ordering • Order of complete site package	• Standard lead time • Transportation lead times
Case O	• Decrease of lead time by defining fixed schedule for activities • Timing of ordering to be explicitly agreed with customer	• Transportation set-up • Co-operation in demand planning with customer • Elimination of locally handled products
Case Q	• Integrating delivery of locally managed products with the main delivery by a logistics partner instead of doing it in local warehouse • Transportation set-up	• Demand planning together with customer • Order of complete site package instead of separate orders to product lines
Case U	• Order of complete site package instead of separate orders to product lines • Deliveries directly to drop-off point instead of local warehouse	• Postpone customer ordering to a later phase in site process • Change of invoicing scheme • Removal of locally managed process to RDC

Table 14. Examples of concrete changes identified at the initiation of local implementations.

In the program level, the initiation was based clearly on the strategy and the corporate-wide need was thus evident. The program was a response to the external changes in the environment like new types of customers and decreasing margins, but it was proactive in a sense that the changes did not yet threaten the organization that was definitely performing in a solid manner with 22% operating margin in 1998. The starting point for the change was neither only an internally designed vision of the future organization as the result of the change, nor was it only about solving concrete and various local problems, such as delayed deliveries or costly obsolete

equipment in a stock. But, the change was initiated based on a business-relevant *challenge* that defined the targeted level of performance. The objective of an efficient and flexible supply chain provided the common direction for the changes in all sub-units, and the selected quantitative change indicators and the localization of the targets made the initiative concrete and more relevant for the various stakeholders. The features of implementation initiation in the BIRD program are summarized as:

- Explicit business-relevant goals for setting the direction
- Measurable targets for ensuring focus
- Local implementation initiation (timing and targets) fitted to the situation
- In addition to the generic objectives, the specific changes required in each implementation were defined in the initiation.

6.3 Management Structure of BIRD

The management structure of the program was altered during its two-year duration as illustrated by Figure 11. In the beginning of the program, the account specific local implementation - that was to become the core of the program - was accompanied with a parallel effort called general implementation that was carried out in a more concentrated manner during the first half a year of the program. General implementation was managed by a separate person and it was mainly about emphasizing the importance of a more efficient supply chain to the top management in the countries. The aim was to gain more discipline and focus to supply chain issues, to initiate local actions that could remedy any immediate problems and prepare for the more comprehensive and fundamental process changes covered by the account specific implementation.

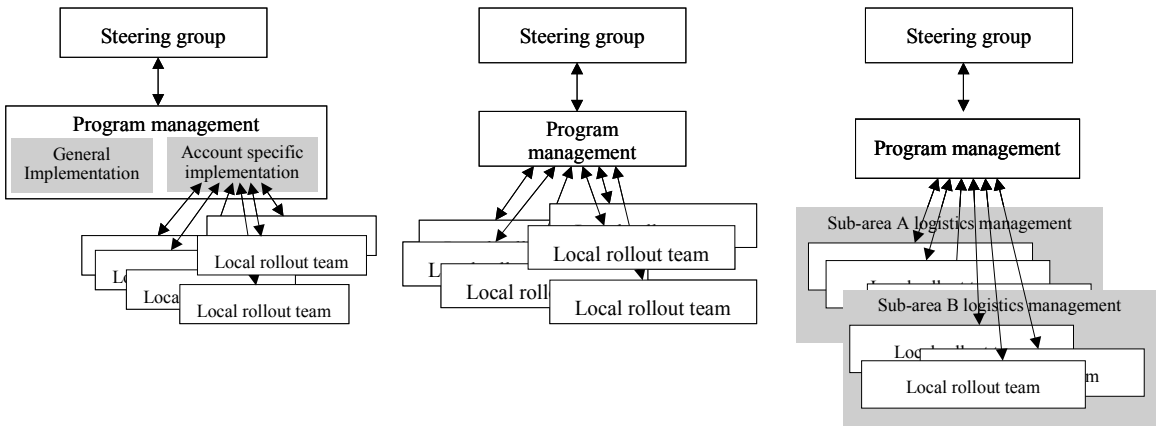


Figure 11. BIRD program's management structure throughout its duration.

After the first half a year, the program started to focus merely on the account specific implementation carried out by rollout teams, as the general implementation effort was completed. Thus, the account specific implementation and its management became equal to the whole BIRD program management. Towards the end of the program, the management structure changed again as responsibility was gradually shifted towards the operative logistics managers that were to manage the operations of the new processes. Despite of the changes in the program's management structure, the main instances managing and implementing the change remained as the centralized 1) steering group and 2) program management, and the 3) local rollout teams taking care of the account specific implementations in various countries. Figure 12 illustrates this basic set-up that, for the sake of clarity, will be referred in this text to as the BIRD program's management structure despite of the slight modifications during the program.

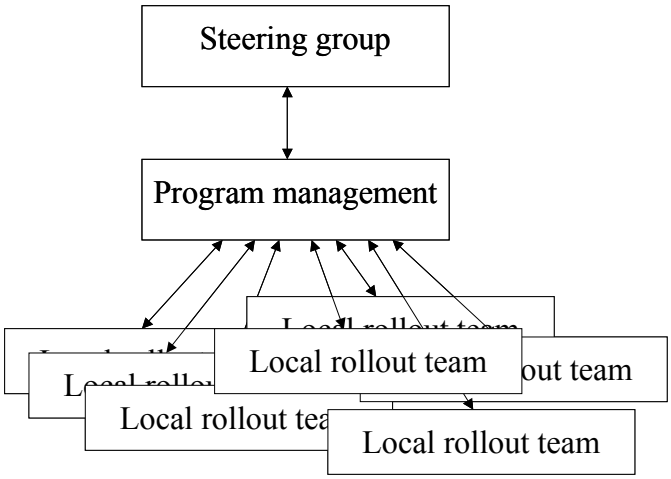


Figure 12. Generic management structure of BIRD program.

Steering Group

The steering group was chaired by the program owner, the Senior Vice President (VP) heading the area of Europe, Middle East and Africa (EMEA), in collaboration with the BIRD program manager heading logistics in the respective area at that time. In addition, the steering group consisted of senior management representing the operative management and development of supply chain, the division involved in the program, information management (IM) and the customer services (CS) organization that was responsible for the network building projects. The members of the steering group changed somewhat during the program lifespan mainly due to organizational restructuring that lead to changes of responsibilities.

The steering group met approximately every second month, and its role was defined as to set the direction of the program, approve the results and the key milestones, select and prioritize the accounts for implementation and ensure the resourcing of the rollout teams in a high level. The success of the steering group's work was determined by the program's business impact ensured by adequate resourcing. In practice, the steering group also discussed issues related to the actual process solutions in high level as well as problems encountered in the implementations or in the interfacing organizations like the product lines, and decided on corrective actions based on them. While following up the progress, mainly in terms of the business impact and the number of completed local implementations rather than any other milestones, the steering group also modified the program plans based on the experiences in the implementation. As well, the steering group reviewed the targets and plans of the program according to the half a year strategic planning cycle applied in the corporation.

The dedicated program steering group was in place until summer 2000 when, in connection with a larger organizational change of global process development and deployment, the role was handed over to a new steering team that covered all development related to supply chain, sales, network building projects and after-sales processes. From the BIRD program perspective the change resulted in less focused meetings and decrease of business ownership as the group no more reacted to the obstacles and problems encountered in the implementations and many of the problematic issues presented to the new steering group remained open without concrete actions. Additionally, the decrease of focus and priority was manifested by the fact that the BIRD program manager was not personally present in the meetings to present the program progress and issues to the steering group, but another person represented all development and deployment programs jointly.

Rollout Teams

The responsibility of implementing the actual changes locally as part of the every day work laid on the rollout teams. A rollout team was planned to consist of 1-2 members from the global development organization and four members of the local account team. The idea was to have a cross-functional team involving members of local account management, logistics and customer services (CS) organization that provided knowledge on the local context and understanding of what practical changes were needed for achieving the targets. The local members also had deeper comprehension on the effects that the changes had on other organizational elements, such as customer collaboration, workload and responsibilities of the people and IT system usage or

data. Implementing the new processes often caused changes in related organizational elements that were not taken into account in the global standard processes.

The global members, whose background mainly was in the product lines, contributed to the holistic view with their understanding of the interaction between the account team and the product lines. The global members also tended to have easier access to the information and people responsible for the program targets, plans and process solutions and issues related to IT systems. This was simply because they were more closely located and had typically met each other personally. As the program evolved, the global members were also often involved in many implementations, which contributed to the reuse of the solutions already developed in another country. The global members were dedicated to the program, so they upheld the interest in the changes if the local members were sometimes overwhelmed by the everyday stress and thus prioritized the operative work over development.

Despite of the plan to have rather standard composition of the rollout team, in practice there was relatively much variation between the teams as can be seen in Table 15 that lists the members of the various rollout teams. The table presents the number of people per role that participated in the rollout team. The rollout manager is underlined (if two persons underlined, the responsibility was shifted during the rollout) and the role abbreviations are explained in the end of the table. In some cases the role of the account (AM) and project managers (PM) was more like forming a local steering group who did not participate in the actual change implementation, but only supported and followed the progress and made final decisions based on proposals, whereas in many implementations they were really the people to carry out the changes. The crucial people to be involved were usually identified in the beginning of the implementation based on the practical changes required in the specific implementation. The number and role of the global members in the rollout team also varied based on the availability of competent resources, expected radicality and extent of the changes and the competence and experience of the local people who could also have participated in an earlier implementation as some of them were working for more than one account.

	AM	PM	CS	LM	LT	LC	RM	LE	Others
Case A	1	1	2	1	1		1	1	Management consultant
Case B	1	1		1		5	1	1	Management consultant
Case C	1	1		1	1	1		1	
Case D	1	1	(1)	1	1		1	1	
Case E	1	1	1+ 1	1		4			Local operations development manager, Regional IT system support
Case F		1	1	1	2	1	1	1	IT system development expert
Case G	3	1	1	1	1		1		
Case H	1	1		1	1	1		1	IT system expert
Case I	1	1		1		4	1	1	IT system key user
Case J				1		2		1	
Case K	1	1	1	1		1		1	System manager
Case L				1					No data available on other team members
Case M				1					No data available on other team members
Case N	1					1	1	1	Account assistant
Case O	1	1		1		1		1	
Case P	1	1		1			1	1	
Case Q				1	1			1	Product line's logistics co-ordinator
Case R				1					No data available on other team members
Case S	Exact data not available.								
Case T	1	1		1				1	Area logistics manager
Case U				1	1	3	1		Product line's logistics co-ordinator
Case V	Exact data not available.								
Case W	1	1	1	1		1		1	
Case X	1			1		1		1	Product line's logistics co-ordinator

AM: account manager; PM: CS project manager; CS: expert from the CS organization; LM: logistics manager; LTL: logistics team leader; LC: logistics co-ordinator (person taking care of the operative logistics); RM: rollout manager from the global development organization and LE: logistics expert from the global development organization. The rollout manager is underlined.

Table 15. Composition of the rollout teams.

Program Management

In addition to the steering group and the rollout teams, there was the program manager supported by a program office and later by a program management team. During the first half a year, also four management consultants were involved in the program, two of them dedicated to the first pilot cases A and B and two of them working with the program management. The consultants mainly contributed to shaping the targets of the program, creating the solutions in

the pilots as well as packaging the piloted solutions for further implementation and developing a standard implementation approach.

The people in the program office were full-time dedicated to the program, as was the program manager since the end of the piloting phase in summer 1999. The program office was complemented with one member supporting the program office manager in summer 1999 and further expanded to a program management team with additional full-time members and some part-time members in the end of year 1999. The original program office manager continued the overall co-ordination of the implementations as a rollout operations manager, but the new members had a specific expertise area, such as process content, inventory management, logistics partner management or training, communications and quality. The extension of the program management to a team was a result of expanding number of simultaneous local implementations that did not all have enough experienced global resources as support. On the other hand, having global members was not even favourable in all implementations, because it sometimes decreased the commitment of the local people and made the hand-over in the end of the rollout more difficult. Also, as the implementation progressed, local people became more aware of the new processes, targets and changes to come and their competence to handle the implementation themselves increased even if they did not have first-hand experience. Thus, sharing the support and expertise of the program management team by all the on-going local implementations was considered feasible. The arrangement of having a supportive team of experts also put emphasis on the consistency and uniformity of the solutions across the implementations.

Throughout the program lifespan, the program management was also supported by experts in interfacing organizations, such as global and divisional process development, the product lines involved, the regional distribution centre (RDC) organization and information management (IM). Table 16 summarizes how the central program management evolved during the program including the most important supportive instances.

Time:	01-06/1999	07/1999-12/1999	01/2000-07/2000	07/2000-12/2000
Members of central program management	• Program manager for account specific implementation (part-time) • Program manager for general implementation (full-time) • Program office manager (full-time)	• Program manager (full-time, former account specific implementation manager) • Program office manager (full-time) • Program office member responsible mainly for communication tools (full-time)	• Program manager (full-time) Management team members responsible for: • Rollout operations management (full-time, former program office manager). In addition, 2 full-time team members. • Processes (full-time). In addition, 1 full-time team member. • Inventory management (part-time) • Logistics partner management (full-time) • Communications and quality (full-time)	• Program manager (full-time, former rollout operations manager). In addition, 2 full-time persons working for the manager. Other management team members responsible for: • Processes (full-time). In addition, 1 full-time team member. • Inventory management (part-time) • Logistics partner management (part-time) • Communications and quality (part-time)
Main supportive instances and their role	• Four management consultants, two of them dedicated to the first pilot cases A and B and two of them working with the program management • Members of global and divisional process development to support in defining the process solutions	• Members of global and division process development to support implementing and improving the process solutions • Global BIRD roll-out team for communication between program management and rollout teams as well as between rollout teams	• RDC project organization • Global BIRD roll-out team for communication between program management and rollout teams as well as between rollout teams	• Operative RDC management to ensure delivery capability • Sub-area logistics managers

Table 16. Central program management during the program lifespan.

The program management was responsible for the operative program management based on the targets agreed in the steering group: planning the overall implementation schedule, following the progress and initiating the implementations with the local teams. The initiation of an implementation typically involved a preparation and a kick-off meeting in the respective country, organized collaboratively with the program management and a local manager, usually from logistics. In the beginning, some of the steering group members also participated in preparing and launching few individual implementations in the countries.

During the time of piloting, the program management supported the pilot teams in creating the practical solutions for implementing the changes. The program office facilitated the work of standardization and packaging of the solutions to an explicit format, such as descriptions of the generic, alternative supply chain processes including IT system usage guidelines as well as

communication and training material to be utilized in further implementations. Members of the pilot teams and global supply chain development organization contributed to the work with their experiences. The standardization work included two major workshops (7.5.1999 and 21-22.6.1999) gathering people from the pilot teams, program management and steering and the interfacing organizations like supply chain development. The extensive workshops were complemented by smaller meetings and teamwork sessions among the stakeholders during summer 1999. A model implementation approach - including supportive tools such as checklists, templates for project plan, closing report and communication material - was as well part of the standardization. The purpose of the model approach was to enable efficient change implementation and utilization of the experiences gathered so far.

Along the time the program manager's focus shifted more to marketing the ideas throughout the organization and collaborating with parties whose support and contribution was crucial to the change, although they were not directly part of the program. To act as the primary interface towards these parties, e.g. product lines, RDC, IM and external logistics partners, was also one of the main responsibilities of the whole program management. Program management took care of agreeing the plans and issues that were generic to all implementations with the parties, as well as communication of the needs common to all rollouts. On the other hand, the program management also communicated the needs and requirements from product lines and RDC in a co-ordinated manner to all rollout teams. In spring 2000, the role of the program manager was handed over to the rollout operations manager, which again meant the program manager's deeper involvement in individual implementations as the two roles were united. However, at that time part of the implementation responsibility was shared with the operative logistics managers each responsible for a sub-area of EMEA, as they were the people to manage and maintain the new processes after the change. In practice the shift of responsibility meant that the managers of logistics in several countries belonging to a sub-area gained a more active role in initiating, resourcing, planning and following up the implementation in the respective countries in co-operation with the program management. As well, members of the central program management provided concrete support and help for the rollout teams in the actual implementation concerning specific process areas.

Another role of the program management was to ensure focus, priority and commitment to the changes in the implementations by agreeing targets with the local teams and following up the progress. The program management sustained the momentum for the change by ensuring that the local development did not stop with the first obstacles, but solutions were looked for. In

addition to the meetings in the countries, these types of issues were discussed in telephone conferences organized formally from autumn 1999 until spring 2000 and later based on the need among representatives from the on-going rollout teams and the program management.

There was also some control that the projects really implemented at certain level standard processes and obeyed the global guidelines, or if not applicable the standards or guidelines could be improved based on the feedback. In practice, the rollout teams were required to produce a set of documents in a standard format including an account analysis, project plan, final report and process description (contents described in the Appendices C-F). In addition, the supply chain process to be implemented was discussed and verified with the member of the program management team responsible for the processes. The verification was carried out in the formal preparation or kick-off meetings, in informal occasions where the relevant people met or through telephone conversations. The discussions could take place several times until the details of the process became clear. However, as the program management team was not in a position to command the rollout teams - especially if the program's interests conflicted with the local interests - the global requirements and standards were more of support than of control. Thus, completely adhering to the standard supply chain processes and implementation approach proved challenging and was not always totally successful if the standards did not make sense in the local context or really contribute to the local implementation.

An important task of the program management was to facilitate co-operation across the rollout teams by organizing so called global BIRD rollout team meetings and implementation workshops for representatives from all on-going implementations. In addition to the typical program management topics like reviews of the plans, progress and steering group decisions, the rollout team meetings included communication and training of the standard processes, tools and implementation approach and even more importantly, sharing of experiences, problems and solutions between the rollout teams. The implementation workshops focused on a specific supply chain process; there was one workshop for direct delivery and another for RDC process. They were meant only for the rollout teams that were preparing for implementing the specific process, and the aim was to co-operatively plan the implementation: find out practical solutions to implement the process, discuss possible problems and exchange ideas with other teams. As an example, in one workshop there was a project manager, who had been very reluctant in the beginning of the implementation but become co-operative and even positive about the change along the process, telling his experiences of the BIRD implementation. According to the direct feedback gained, the members of the other implementation teams found him sharing his views

and opinions more authentic and thus more valuable than if the topics had been covered by the program management.

To conclude the instances in the BIRD management structure, Table 17 presents the participants, roles and responsibilities of the steering group, program management and the rollout teams.

Instance	Participants	
Steering group	• Program owner (VP of the area) • Program manager • Program office manager (later rollout operations manager) Senior management representing: • Supply chain operations • Process development • The division involved • Information management • Customer services (Replaced by a generic corporate-level steering group in spring 2000 including some of the same members)	**Role:** To ensure program's business impact through cross-functional management support
		Responsibilities: • Set the direction of the program • Ensure resourcing in high level • Discuss issues and problems related to process solutions and implementation, decide on corrective actions • Review targets and plans according to the progress • Approve results and key milestones • Select and prioritise implementations
Program management	• Program manager • Program office manager (later rollout operations manager) with 1-2 team members Program management team members responsible for: • Process content • Inventory management • Logistics partner management • Training, communications and quality	**Role:** To initiate, co-ordinate and support local implementations and to ensure consistency of the implemented changes.
		Responsibilities: • Run traditional program management tasks, such as scheduling, resource planning and progress control • Maintain commitment and focus to change e.g. by providing support for solving implementation problems • Support in the implementation work • Act as an interface towards supportive organizations that were not directly part of the program • Provide standard implementation approach and supply chain processes • Control consistency of implementations • Facilitate co-operation and learning across rollout teams
Rollout teams	• Local account manager • Local logistics • Local (CS) project management • Global process development	**Role:** To implement changes as part of every day work in the local context.
		Responsibilities: • Translate the targets and standard solutions into practical actions, i.e. execute the changes • Understand the systemic effects of the changes in the specific context and solve possible conflicts • Collaborate with local interest groups like customers, partners and employees outside the rollout team • Communicate the progress, solutions, problems and learnings to the management team and other rollout teams to support program progress and exchange of experiences • Run traditional project management tasks in the rollout level, such as scheduling, resource planning and progress control

Table 17. Summary of the members, roles and responsibilities of the instances of the management structure.

Relationship between the Parties

The different teams could be considered to form a kind of hierarchy, but in practice the management structure differs from a hierarchical one. Based on the roles, it can be stated that the steering group gave a rather high level of autonomy to the program management, as did the program management to the local rollout teams. The rollout teams planned their work independently within certain guidelines and defined the basic supply chain process based on the standard alternatives. The role of the central program management was not to give orders about the implementation or strictly control the individual rollout teams, but to support them. Nor was it formally in an authoritative position, because the program organization existed only beside the line organization according to which the local team members reported to the local management. So, the instructions given by the program management to the operative management and employees had to be based on argumentation, not on power.

However, giving autonomy within certain limits to the teams was not the only thing that distinguished the management structure from a hierarchical one. Perhaps an even more important difference was that the rollout teams had a high influence in the whole program according to the first-hand experience they had on implementing the changes. Thus, letting the rollout teams to decide on the details of the local process application was not enough; the program management also had to learn about the local solutions for exploiting the developed understanding in the overall program. The knowledge and understanding of the local employees was not used only in the respective implementation, but also more globally in the program.

Thus, there was a two-way relationship between the parties: the local rollout teams were influenced by the decisions and targets set by the central steering and management as well as the central steering and program management were influenced by the experiences and learnings in the implementation. The program management completed and modified both the implementation approach and the supply chain solutions based on the learnings from the implementations, and the steering group adjusted targets and plans according to the implementation experiences. Thus, the rollout teams contributed to the creation of the global solutions and influenced the schedules and plans just as the management team members. Table 18 describes examples of the decisions made or actions agreed in the steering group and program management based on the experiences in the local implementations. It provides firm evidence of how the possibility for bottom-up influence was not only cosmetic, but truly existed besides the more traditional top-down management.

Experience in local implementations	Consequent decision or action by steering group
Capability of one product line to deliver products as modules was identified critical for the new supply chain processes especially in pilot B.	Schedule of having the delivery capability of modules was verified from the development team and promised to be delivered to rollout managers.
Need for stronger participation of customer service (CS) representatives for implementing pilot case A was experienced.	CS top management arranged members to participate as soon as resources would be available from the coming network launch and the internal development of CS project communication and responsibilities.
Customer involvement in defining the process in pilot A was very limited as it was a turnkey project where Nokia had full responsibility of the network building.	A new account, case C, was first proposed and in the next meeting agreed as another pilot to get more customer input to the development.
After the first implementations in turnkey customers projects (A and E), CS's deeper involvement was considered crucial in all implementations for turnkey projects.	It was agreed that BIRD rollout manager in turnkey cases should come from the CS organization, if appropriate resources available.
Unreliable deliveries from one of the product lines caused problems in several implementations.	Steering group required urgently from the product line's top management a clear approach for how to handle the products. Consequently, responsibilities were clarified and instructions given to the relevant stakeholders.
The service level (lead time) of the direct delivery process was considered too long e.g. by cases A and D.	Decision of RDC project and piloting was made to provide a third supply chain process option as a compromise of the service level benefit of country buffer and cost efficiency of direct delivery.
	Consequent decision or action by program management
In pilots A and C, it was experienced that in addition to the supply chain structure, processes differ due to the business case: differences in responsibility share between Nokia and customer, product scope, contract and network maturity.	Processes were designed modular instead of monolithic, to enable possibility for variation due to the different business cases.
In case E, the country buffer process was experienced to be inappropriate for a project in a dynamic stage with unstable demand.	Instructions for country buffer process were modified in a way that took unstable demand better into account.
Rollout approach was considered too heavy in many implementations, especially the ones lead by locals.	Based on the feedback, a modified rollout approach was provided in spring 2000 to avoid extensive extra bureaucracy and documentation.

Table 18. Examples of steering group and program management actions due to experiences in the local implementations.

However, the management was not merely bottom-up or local either. As obvious from the description of the parties and roles, the program was not just a collection or accumulation of independent implementation teams united only by a common vision, but the program management worked to co-ordinate the individual implementations, ensure consistency of the supply chain processes implemented in various account teams and reuse of the solutions once made.

The management structure of the BIRD program can be described as *co-ordinated, but decentralized* and the general characteristics can be summarized as:

- Light central management to ensure progress and consistency across implementations
- Local rollout teams to provide knowledge on local context and every-day work
- Autonomy of the parties (program and the rollout teams) for utilizing the knowledge of the local members
- Two-way influence between the parties (steering group, program management, rollout teams) to ensure exploiting local knowledge throughout the program.

6.4 Implementation Process in BIRD

Figure 13 illustrates an overview of the implementation process in the BIRD program to provide a starting point for the process description, although it does not highlight all the important aspects of the process, which will be described in this chapter.

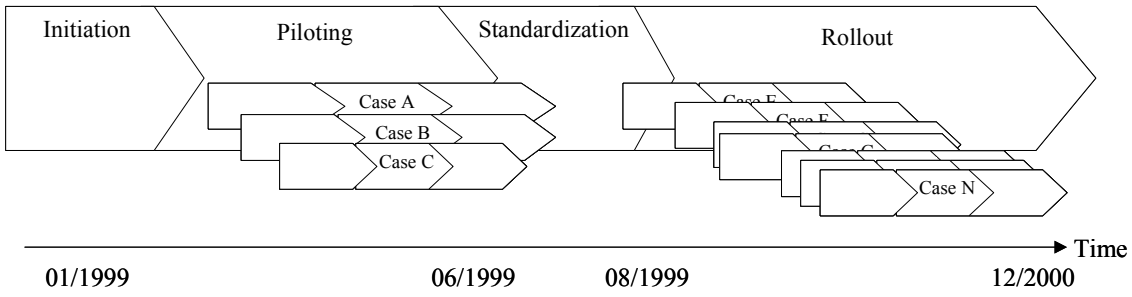


Figure 13. Overview of implementation process in BIRD.

Overall Change Implementation Process

When the program was established, the proposed targets, approach and structure for the piloting period were agreed. The purpose of the program was set and the key resources and steering were nominated. The main means for reaching the targets were agreed to be the new supply chain processes, and the principles of the target processes were concluded mainly based on experiences from an earlier development effort that had been carried out by the biggest product line with few customers. On-going development projects that were to produce solutions crucial for the program success were aligned with the program in a way that the results could be utilized and further improved based on the practical experiences from the implementations. These projects were related to new IT system version, demand planning procedures, metrics and to

developing modules of several product units as the entity to be delivered by the product lines. Also the scope of the program was agreed in terms of the geographical area and the product group to start with.

The next period in the program was piloting of the new processes, which started approximately one month after establishing the program, although the tentative discussions with the pilot account teams had already started before the official initiation of the program. The idea was to finalize the development of the target processes by implementing them in two pilot customer projects in real business context, one representing the direct delivery and the other one the country buffer process. Soon after starting the two pilot implementations, a third customer project was added as a pilot due to the limited customer involvement in the original direct delivery process pilot. Thus, the number of pilots ended up being altogether three. The piloting involved creating understanding on what practical changes were required for reaching the targets as well as deploying the changes as part of everyday work. That way the more detailed processes could be defined together with the people responsible for operating the processes under change. Also, through the pilots the solutions planned were verified to produce the targeted business benefits.

After the pilots, standardization of the piloted supply chain solutions and implementation methods took place. The process descriptions created in the pilot cases as well as the experiences about the implementation were packaged in an explicit form so that they could be utilized in the coming implementations. The output of the standardization phase was thus 1) a description of generic, global and standard supply chain processes including IT system usage guidelines and 2) a model approach for implementing the changes that consisted of generic implementation phases, proposed duration and checklists for each phase, templates for analysing the business case (account analysis), implementation project plan and closing report (see Appendices C-F). Based on the implementation plans and the standardization work, rollout - referring to full-scale implementation for achieving complete coverage of the new supply chain processes - was started. This involved implementing the changes in each account according to the local conditions. The rollout period ended to the program closure involving gathering of program documentation and handing over the responsibility of managing the new processes and completing some still on-going activities to the operative logistics line management. The main activities not completed within BIRD scope, but continued by the line management, were: planning geographical expansion of BIRD principles, applying the processes for new products and establishing another RDC.

Concerning the implementation plans, only the pilot cases were planned in relatively detailed level when initiating the program. The plans included the schedule, targets in terms of the intended business benefits and the basic supply chain process to be implemented. Proposals for the number of other implementations by the end of year 1999 were made, but no decision was made until the piloting period approached its end and the standardization had been started. The target number of accounts to be covered was decided by the steering group and followed by discussions with the local management for agreeing the specific accounts ready for implementation. The decisions on the targets were revisited every half a year as there were deliberate checkpoints for reviewing and complementing the plans based on experiences gathered in the implementations and possible changes in the program's environment.

The implementation process in the BIRD program can also be reflected with the phase models, e.g. the generic four-phase model of exploration, planning, action and integration by Bullock and Batten (1985). The model was presented in chapter 4.1 and repeated here in Figure 14 to bring it back.

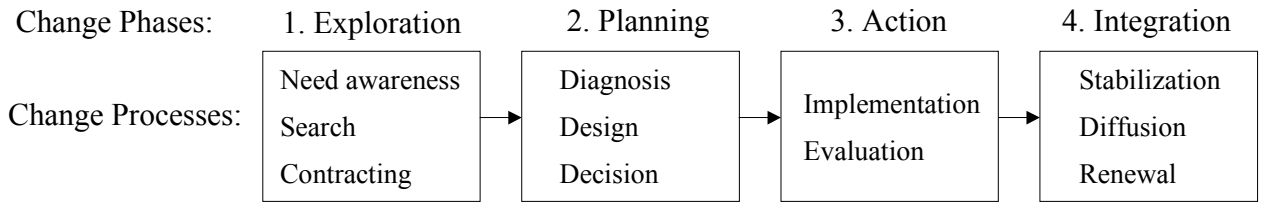


Figure 14. Outline of the four-phase model of organizational change (Bullock and Batten, 1985).

The most significant events and activities during the program are listed in Table 19. The events in Table 19 are arranged based on the order of occurrence, the timing is presented as months and the respective period in the implementation process is included in the table. As well the respective generic phase based on the model of Bullock and Batten (1985) is indicated in relation to each event or action. For the sake of readability, the activities are presented only based on their start or completion instead of illustrating the complete lifespan of each of them.

Period in BIRD	Time	Event or activity	Generic phase
Initiation	End of 1998	• Idea of the program based on expected changes in competitive environment and good experiences of a respective effort in another business group • Planning and specification of a new version of product lines' IT system started • Product lines' product module development project on-going since autumn 1998 • Discussions with pilot A and B started?	Exploration Planning Planning Exploration
	01/1999	• Program established • Overall targets, approach and two pilots to be implemented by 05/99 agreed. • Pilot preparations started for case A and B with the accounts • Account teams' IT system support for new processes verified • General implementation started	Planning Planning Planning Planning Action
Piloting	02/1999	• Target schedule revised: Pilots to be completed 06/1999, standardization to be done 06-09/1999, full-scale implementation to be started 09/1999 • Pilot case A started • Pilot case B started	Planning Action Action
	03/1999	• Pilot case C started	Action
	05/1999	• Target number of implementation for 1999 decided to be 12 • Implementation approach workshop to summarize pilot experiences • Product line's capability to deliver modules for pilot B reached	Planning Planning, Integration Action
Standardization	06/1999	• Implementation plans completed based on the pilots and approved: 6 existing accounts and 6 prospects for implementation agreed • Model implementation approach and standard target processes developed	Integration, Planning
Implementation	08/1999	• Case D and E started	Action
	09/1999	• Case F, G and H started • New version of product lines' IT system piloted in case A • RDC feasibility study done • Follow-up audits for implemented customer projects started, first audit in case B	Action Action Exploration Planning, Action Integration
	10/1999	• Targets for 1999 revised: 15 accounts as 3 of the originally decided 12 were already close to the target process as a result of a previous development effort. • Targets for 2000 set: 23 accounts by the end of 03/2000, 25 accounts 06/2000, 27 accounts 09/2000 and 30 accounts by the end of the program 12/2000 • RDC project started • Cases D and G changed to RDC pilots, case I started as RDC pilot	Planning Planning Action Action
	12/1999	• Program plans, targets and structure for 2000 agreed	Planning
	01/2000	• RDC implemented and first deliveries to case D and G started • Cases J, K, L, M and N started • Direct delivery implementation workshop for starting rollouts	Action Action Planning
	02/2000	• Case O started • Model implementation approach including the tools revised	Action Planning
	03/2000	• Cases P, Q and R started • RDC implementation approach development started based on the pilots • First country warehouse closing plan made	Action Integration Planning

	04/2000	• Cases S, T and U started • First RDC implementation plan prepared • RDC implementation workshop for starting rollouts	Action Planning Planning
	05/2000	• Planning BIRD mode for the new products started • Last meeting of the dedicated steering group	Planning Planning
	06/2000	• Case V started	Action
	07/2000	• Implementation responsibility share with logistics line management formalized • Cases W and X started • Discussions of BIRD expansion to Asia and Pacific (APAC) area and Latin America	Planning Action Planning
	09/2000	• Feasibility study for 2nd RDC	Exploration
	10/2000	• Case H upgrade from country buffer to RDC process	Action
	11/2000	• Program learnings gathering and closure documentation	Integration
	12/2000	• Case B upgraded to RDC process • RDC piloting for first new products started • Program closure and hand-over to operative management	Action Action Integration

Table 19. Most important events and activities of the BIRD program.

Table 19 provides a simplified view to the program progress as the local implementations are listed only based on their start according to the kick-off meetings. An individual local implementation also refers to only one of the generic phases, namely the action phase, although in practice the process of one implementation included all the four phases of exploration, planning, action and integration that also overlapped and iterated. However, even in its simple form the Table 19 clearly shows that the process of the case program was neither linear nor deterministic. Although the periods of initiation, piloting, standardization and rollout resemble the phase models, they do not separate the different types of activities, e.g. planning, action or follow-up, but describe more how the focus of the program changed over its duration. The generic phases iterate throughout the program duration. Planning was not completed before going for piloting or even to the actual implementation, but the plans were constantly modified and complemented based on the experiences and results in the pilots and implementations. Although the supply chain process solutions had been verified in the three pilots and standardized only after that, more learning took place constantly still during the implementation and the plans, solutions, implementation approach and tools were revised accordingly (see also Tissari and Heikkilä, 2001).

Local Implementation Process

As described above, a model process for carrying out the local implementations was developed during the standardization phase as part of the implementation approach. The model process consisted of generic process phases with suggested duration depending on the type of the business case and a checklist of activities to be done in the end of each phase. The checklists and

the duration of the phases were not used for controlling the implementation externally by the program management or the steering group, but as a tool for the rollout teams. The hand-over to the follow-up phase was the most interesting milestone as it was the basis for determining the number of completed implementations, which was one of the main success criteria of the program along the achieved inventory reduction. The model process also evolved during the program as the implementation teams applying it considered the original version too heavy and a revised one was introduced in spring 2000. Figure 15 presents both the original and the revised model processes, the suggested duration of the phases and the meetings related to each phase that gathered the rollout team and program management.

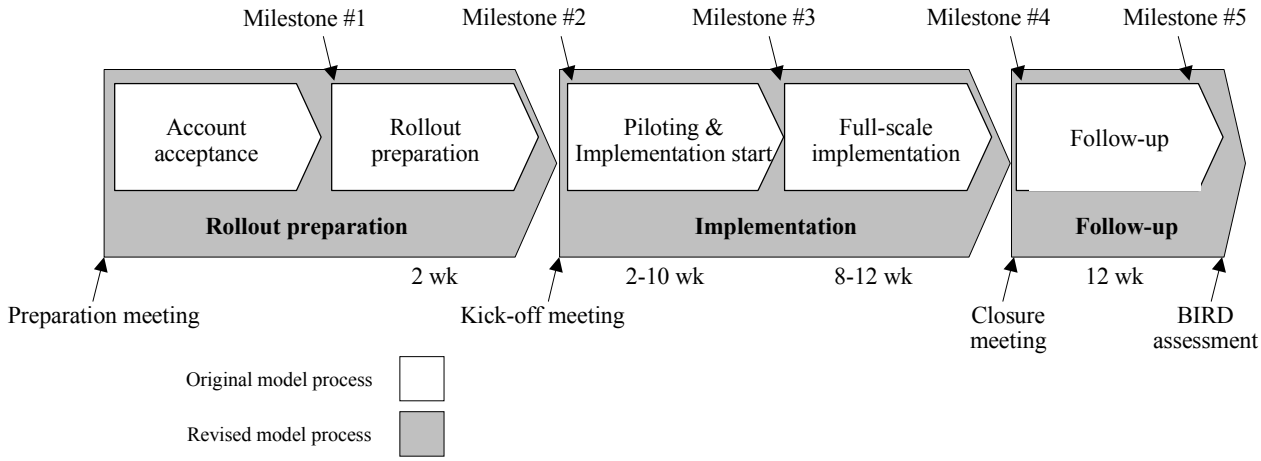


Figure 15. Original and revised model processes for local BIRD implementation.

The generic process and milestones were used as a tool to support the implementation by giving guidelines for how to start the implementation and what elements need to be changed as part of the process. To depict the practical activities involved in the process, Table 20 presents the checklists related to each phase (according to the revised model process).

Preparation	Implementation	Follow-up
☑ Customer contract reviewed ☑ Basic demand planning and key metrics in place ☑ Analysis of the business case done (account analysis) ☑ Target supply chain process selected ☑ Country management committed to the approach and timing ☑ BIRD rollout manager and local team nominated ☑ Relevant people in the country informed about the implementation and targets ☑ Clear targets set ☑ Project plan done ☑ Project kick-off meeting organized	☑ Target supply chain process designed and business impacts quantified ☑ Logistics partners selected or verified ☑ IT systems and reports mapped into new process ☑ Working instructions done ☑ Training given ☑ Piloting done ☑ Plan of switching over completely to the new process ☑ Required changes implemented as part of everyday work ☑ Follow-up procedures agreed ☑ Final report done ☑ Closure meeting organized	☑ Business impacts analysed ☑ Conclusions from the rollout documented ☑ Follow-up meeting organized to review how the new process is working

Table 20. Checklists for model implementation process phases.

An individual local implementation covered a relatively small organizational entity, which was familiar to most of the rollout team members. Even though, the implementation processes could not always be planned exactly and carried out as planned. Thus, they were seldom as straightforward as the model process. As an example of an actual local implementation processes, Table 21 describes the most important events and activities in the implementation process of case D. For further examples, see Appendix H that presents the corresponding information of the implementation processes in cases G and U. The cases were selected based on data availability and to represent implementations started in different periods of the program lifespan. As well, the cases represent implementations with relatively significant changes.

BIRD model process phase	Time	Event or activity	Generic phase (Bullock and Batten, 1985)
Rollout preparation	06/1999	• Discussions on starting the local implementation among program management and local logistics manager.	Exploration
	07/1999	• BIRD preparation meeting in the country involving program management, the prospective rollout manager and logistics expert and representatives from local logistics organization. Basic process (direct deliveries), targets and kick-off meeting date and agenda agreed.	Exploration, Planning

		• Account analysis made	Planning
		• Local workshop with the respective product line on how to manage third party products. Actions agreed and implemented.	Planning, Action
		• Preparation involving CS representatives	Exploration
Implem-entation	08/1999 - 09/1999	• BIRD kick-off meeting involving program management and local rollout team, representatives from account management, CS, local logistics and product lines. Basic process, concrete major changes, targets and rollout schedule agreed.	Exploration, Planning
		• Local workshop agreeing demand planning process	Planning, Action
		• New demand planning tool piloted and taken in use	Action
		• Local workshops concerning the detailed process, especially integrating deliveries with the site process, both the parts managed by Nokia and the customer	Exploration, Planning
		• Definition of transportation issues	Planning
		• Global performance indicators taken in use through modifications in the use of IT system	Action
		• Preliminary discussion with a customer representative on the planned changes	Exploration
		• Cross-functional preparation on the customer proposal	Planning
		• Problems encountered concerning customer's unreliable planning related to site process: unnecessary site visits and increasing inventory as a result. Problems analysed and taken into account in target process definition	Planning
	10/1999	• Transportation according to new schedule started	Action
		• Proposal of the new process presented to customer	Planning
		• New process taken into use with customer	Action
		• Due to problems with the new process, especially in integrating direct deliveries with customer's site process, discussions to change target process to RDC. Decision made.	Integration, Exploration
		• RDC kick-off for the case involving representatives from RDC project management and logistics manager of case D	Planning
		• RDC preparations started: volume estimation and product portfolio made	Planning
	11/1999	• RDC process presented to other members of case D rollout team: discussion on current problems related to direct delivery process, potential benefits of RDC process and content of new customer proposal	Planning
		• Ramp down of local emergency buffer. Express pipe process taken into use	Action
		• Problems in metrics reporting encountered. Solutions looked for by global IM	Action
	12/1999	• Local information sharing on RDC process details	Planning
		• Local RDC process documented in detail	Planning
	01/2000	• RDC transportation issues agreed with the logistics service provider	Planning
		• IT system test for RDC process involving all stakeholders (local, RDC, product line)	Planning
		• First RDC order made	Action
	02/2000	• RDC process internally taken in use in full scale.	Action
Follow-up	05/2000	• RDC process officially agreed with customer and new way to integrate deliveries with site process fully taken in use	Action
	06/2000	• Final report completed	Integration

Table 21. Most important events and activities in case D.

Comparison between the phase models and the change implementation process in BIRD exposes that the process was not linear or sequential. Aiming for better results, tasks and activities could be redone and replanned. Even new solutions could be explored due to improvement ideas based on experiences or changed conditions causing need for adjustment. Although the process was planned beforehand, to some extent especially the longer-term plans were completed and revised during the progress, and due to unexpected events and issues even the shorter-term plans were not always obeyed. The plans and schedules helped in getting started and were necessary for planning the resources for the work. Yet, the emphasis was not on complying with the plan, but on achieving the results somehow, which may have differed from the original plan. Despite of the overlapping and iteration, the process was neither a continuous cycle. The program as well as the individual implementations had a start, end and a hand-over to operative management and employees. Also, the targets were to be achieved during a specific time frame in a focused manner.

While being neither linear and deterministic nor continuous, the change implementation process in BIRD can be described as *dynamic*. The following characteristics summarize the nature of the process:

- Schedules and milestones as a basis for implementation activities
- Longer-term plans open or suggestive and completed and revised according to progress
- Process subordinate to change objectives. Activities may overlap and iterate, if it contributes to better results.

6.5 Change Advancement in BIRD

The change advancement refers to how change progresses in the organization. The advancement may be holistic: implementation aims at taking in use a comprehensive design of the target state at once in the whole organization. Or, the advancement may follow an incremental way of introducing change as smaller subsequent activities in parts of the organization. The advancement concerns both 1) the completeness and quality of the implementable solutions and 2) the progress of the change coverage throughout the organization. In this chapter, the advancement of the *implementable solutions* is indicated by unfolding the initial understanding of the change content and the modifications made to it based on learning and experiences during the implementation. In addition, this chapter aims at creating understanding why the modifications were needed during the implementation and could not be anticipated during a separate design phase before the implementation. Concerning the progress of *change coverage*,

the description of the implementation process in the previous chapter already illustrates how the change was not implemented to cover the whole organization at once, but in a few accounts at a time. In this chapter, the coverage advancement is further indicated by unfolding how an individual local implementation did not necessarily involve the complete solution, but only the most significant elements of it.

First, the initial change content was defined based on the program challenge, experiences of earlier development efforts and rational reasoning. Next, three different pilots were carried out to verify, improve and concretize the initial content by implementing it in real-life context. The experiences from the pilots were then gathered and standardized to global, generic solutions to apply in all the cases. In the rollouts, the standardized solutions were then applied in the new cases. Thus, two different trends can be distinguished in the change advancement in the BIRD program: *divergent* and *convergent* separated by the standardization effort. The pilots represent the divergent trend as they were deliberately meant for elaborating the solutions, whereas the aim in the rollout period was rather to apply the standard solutions. However, despite of the standardization aim, modifications and improvements were made during the rollout period as not everything could be anticipated based on the three pilots.

Initial Content of the Change

The supply chain process solutions to be implemented in the BIRD program were based on experiences in earlier development efforts where some of the ideas had already been tested. The first major effort to reengineer Nokia Networks' supply chains was made in 1997 and 1998. The largest product line, also part of the division involved in the BIRD program, made an attempt to improve its supply chain performance by implementing a time-based management initiative together with few customers. The aim was to increase the supply chain performance by improving the quality of planning with the customers. This initiative proved successful with some customers and failed with others, as not all the customers were ready or capable for the changes. Despite of the challenges in integrating the chain between the customers and Nokia, the effort resulted in the product line's readiness for enhanced speed and flexibility.

Based on a deliberate decision, the BIRD program was to focus particularly on implementing comprehensive solutions as a means for reaching the intended business performance improvements. Rather than designing new supply chain solutions from scratch in the BIRD program, the program was more about gathering the various ideas and on-going development efforts in the organization and directing them towards meeting the program challenge of

increased supply chain productivity and customer satisfaction. The emphasis was wilfully placed on implementing ideas that had already been introduced earlier, but not systematically and comprehensively put in practice despite of few tests or pilots. Yet, there was a need to further develop and enhance the solutions in the pilots to make them work in the real business environments.

Implementation was started as two parallel streams: general implementation and account specific implementation. General implementation involved 1) motivating immediate actions in the account teams by emphasizing the importance of supply chain and inventory management to the top management of the countries, so called "fat cutting", 2) review of the contracts between Nokia and its customers and 3) implementation of a basic demand planning process. General implementation was carried out in a concentrated manner in all account teams during the first half of 1999.

The *contract review* meant analysing the issues in the contracts that could potentially hinder efforts towards a more effective supply chain as well as suggestions for how to improve them. Based on the analysis, the account managers were responsible for implementing the enhanced terms, typically as part of the normal contract renegotiations, which in some cases happened before the actual BIRD implementation as a prerequisite activity, and in other cases as part of the BIRD implementation. Or, sometimes the new BIRD supply chain processes were a pre-requisite for amendments in contractual terms. Additionally, the effort aimed at securing reasonable terms in any new contracts. The basic demand planning process, including an interim tool, was ready for implementation at the time of the program initiation. Thus, the basic planning process was implemented in most account teams by summer 1999 independently from the yet non-existing account-specific BIRD implementation plans. The basic demand planning process implementation was relatively light, it did not necessarily require changes in other elements of the supply chain and the benefits of the planning process for the entire organization were realized only when majority of the account teams worked according to the process. As well, good demand planning was a pre-requisite for the fast lead times required by the new supply chain processes, so it made sense to implement the basic demand planning process as quickly as possible.

The other stream, account specific implementation, focused on the actual *delivery* of the products. Initially, the three alternative processes were: box delivery, site delivery and implementation buffer. The box delivery process had already been successfully implemented for

some customers in the earlier development effort. Concerning the site delivery and implementation buffer processes, the principles were known in the beginning of the program in relatively high level as described by the following definitions:

- Box delivery:
    - Delivery including products from a single product line
    - Delivery triggered based on a definite need in customer interface
    - Delivery from product line directly to a customer warehouse or a drop-off point. (Drop-off points are facilities close to the final site appropriate for keeping the equipment temporarily until the installation team picks them up for installation at the site, as the products typically cannot be delivered to a final site due to access and security reasons).
- Site delivery:
    - Delivery triggered based on a definite need in customer interface
    - Delivery of a complete site package including all products from different product lines needed for building one site
    - Products delivered as modules from the product lines and integrated into a complete package in premises operated by a logistics partner. (Modules are standard, i.e. non-customer specific and consist of several units that form a functional entity.)
    - Delivery from product line via the integration premises directly to a drop-off point without a stop in any customer-specific warehouse.
- Implementation buffer:
    - Product modules buffered in the destination country
    - Kanban-controlled buffer replenished based on consumption
    - Delivery of a complete site package from the buffer to final site or drop-off point triggered based on the definite need in customer interface.

The site delivery and box delivery processes were the globally preferred ones as they represented a more direct link between the demand and supply, and enabled better efficiency in the process. The implementation buffer process was provided as an alternative for the business cases where immediate change to direct deliveries was too challenging.

In addition to contractual terms, demand planning and the delivery process, global *performance indicators* for measuring the chain performance were to be implemented as part of the BIRD program. The indicators had been defined and the new version of the account teams' IT system

was under work to support their reporting. Table 22 sums the initial content of the change, i.e. the elements identified as part of the supply chain process solution in the beginning of the program, and the development status in the beginning of BIRD concerning each element.

Initial content of changes in BIRD program	Status in the beginning of the program
Contractual terms between Nokia and its customers to support efforts towards effective demand-supply chain	Analysis of how to improve the existing contracts started with account teams in the beginning of the program as part of the general implementation.
Systematic *demand planning* process in the account teams in collaboration with the customer	Process and interim tool nearly ready for implementation.
Replacing the traditional push mode *deliveries* from warehouse to customers with: a) Box delivery b) Site delivery c) Implementation buffer processes.	a) Already implemented with pilot customers in the previous development effort b) Principles available, process to be developed in the pilot. According to the principles, required IT system changes and product modules that were under planning. c) Principles available, process to be developed in the pilot. According to the principles, required product modules that were under planning.
Indicators for measuring supply chain performance	Global indicators defined and development started for IT system solutions.

Table 22. Originally identified content of changes in the BIRD program.

Content Modifications based on the Pilots

The three pilots were carried out especially for verifying, improving and complementing the initial content of the change. Thus, two types of modifications were made to the supply chain process solutions based on the pilots. First, the process guidelines and principles were developed to more detailed and specific process descriptions based on the practical experiences in real business environments. Second, some clear changes were made to the initial solutions as they either did not contribute to meeting the challenge at hand or could not be implemented in practice as planned.

The three pilot teams collaborated to exchange ideas, and the aim was to implement solutions as similar as possible across the pilots, especially among the two site delivery cases A and B. However, as the pilots were on purpose selected to represent different business cases, also the solutions ended up being rather different. Yet, a lot of understanding of the reasons for the differences was gained: it was not sufficient to provide variation in the local processes only based on the supply chain structure. Other factors, such as the range and format of products delivered to the customer and the responsibility share between the customer and Nokia concerning the site process, also caused differences across the implementations. Consequently, the process alternatives were modified from the initial Box, Site delivery and Implementation

buffer to two basic alternatives, *Direct delivery* and *Country buffer*. The basic processes were developed to consist of process modules that provided alternative ways to perform specific activities of the process and thus enabled variation inside the basic process. The modules were generic across the two basic process, which supported the target of standardization and yet provided the possibility for variation. Each module description also included instructions for *IT system use* in carrying out the activity. In addition, specific instructions for IT system use for both basic processes were developed based on the system verification done by the IM organization in the beginning of the program as well as the experiences of the actual system use in the pilots. The instructions focused on the differences between the old and new ways of using the system.

Integrating the product deliveries to the *site process* - whether it be the customer's or Nokia's responsibility - was fully understood as a critical element of the change based on the pilots. Especially the direct delivery pilots showed that a shorter delivery lead time alone would not contribute to the supply chain efficiency, if the products could not be installed as soon as they arrive, i.e. if the site process did not progress as it was planned at the time of ordering the products. Thus, a suggestion of how to integrate the two processes was added to the spectrum of solutions, although the detailed solution had to be defined specifically in each implementation due to differences in the site process across the network building projects and the types of sites used in the network.

Delivery capability of product modules was achieved during the pilots and the modules were used in one of them, case B with the country buffer process. Unexpected limitations in replacing the product units completely with the modules were encountered in the development: spare parts needed to be delivered as individual units, some customers wished to order product entities specified by themselves and IT system restrictions complicated the use. As well, in the direct delivery process the site package anyhow included all the units needed at the site, so it did not make a difference for the customer whether the products were packed as modules or units, whereas the product line shipping the modules encountered additional work. Thus, the *product module* use was excluded from the direct delivery process and restricted only to the country buffer process where they significantly decreased the number of products to be handled in the buffer. The objective of simpler product structures would then be further addressed already in the development phase of new products.

The country buffers were operated mainly by external logistics partners. In addition to the generic process definitions, more detailed instructions for *operating the buffer* were experienced necessary for the implementation. Instructions - including generic models for kanban cards and boards, buffer layout and the set-up of the shelves - were created in the pilot case B and further developed to be used also in other implementations. The kanban cards and boards could even be physically provided by the BIRD program office that had agreed about the availability with a product line used the same cards and boards. External logistics partners executed also the deliveries and possible integration of different product lines' deliveries as a site package. Managing the changes related to the co-operation between Nokia and its *logistics partners* was as well recognized as an integral element of the implementation. The program office started to co-ordinate the global partner-related issues in collaboration with the corporate-level logistics partner management team. Additionally, the program office created guidelines and instructions for the operative collaboration and contractual set-up with the partners to support the local BIRD implementation, as the local organization was responsible for the logistics inside the respective country.

The basic supply chain processes were developed mainly for the deliveries from the Nokia product lines, which either manufactured or assembled the products themselves or just managed and delivered products purchased from a third party. In addition, the account teams delivered to the customers a variating range of third party products that they managed, purchased and handled locally due to reasons ranging from a perceived cost or availability benefit to the desire or contractual obligation for using other than the globally provided products. These *locally managed products* challenged the possibility to deliver complete site packages. In the direct delivery mode the difficulty was to ensure the availability of the locally managed products at the same time with the delivery from the product lines, and in the country buffer mode it was the increase of the buffer size, as the demand of the third party products was typically rather unstable. Thus, standardization of the locally managed products was added to the scope of the change to eliminate or minimize the number of these products by replacing them with global ones, or to rationalize their handling. Table 23 summarizes the modifications in the solutions made during the standardization period based on the pilots.

Modifications	Reason for the modification
Box and Site delivery processes combined as Direct delivery (and Implementation buffer process renamed as Country buffer)	Deeper understanding of the processes resulted in the decision to define the basic processes only based on the supply chain structure (direct both in Box and Site deliveries). The variation possibility would be built in the modular direct delivery process.
Direct delivery and Country buffer processes defined as modular	In addition to the supply chain structure, also other factors were experiences to cause need for process variation. Modularity enabled further variation inside the basic Direct delivery and Country buffer processes.
IT system solutions defined for Direct delivery and Country buffer processes	The system verification done in the beginning of the program was revised to better reflect the way that most account teams actually use the system and emphasize the changes between the old and new ways of systems use.
Suggestion for integration of deliveries to site process defined	It was learnt that if the products cannot be installed at the site as soon as they are delivered, shorter lead time alone could not improve the supply chain efficiency. Thus, a suggestion was made about the site process phase, during which the order should be made.
Use of product modules excluded from Direct delivery process	To completely replace unit deliveries with the modules was experienced impossible due to need for deliver units as spare parts and restrictions related to IT systems. The modules did not add much value in the direct delivery process, so the use was limited only to Country buffer process.
Process for buffer operations defined	As external resources were used in the buffers, clear and detailed instructions were needed in addition to the more generic modular process descriptions.
Guidelines for logistics partner management defined	Also the deliveries were executed by external partners. Generic guidelines for operative collaboration and contractual set-up were made to support the local rollout and standardized the collaboration.
Standardization of 3rd party products	In many cases, complete site packages included 3rd party products delivered directly from the vendors and not from product lines. To ensure availability of the whole site package at once, the use of the locally managed 3rd party products had to be standardized.

Table 23. Modifications and additions to the content of change during piloting and standardization.

Content Modifications after Standardization

Even after the standardization, modifications were still made during the rollout period for two reasons. First, not all the modification needs identified during the pilots could be standardized into solutions immediately before starting the rollout, but the development took some time. Second, as yet more practical experience was gained during the rollouts some new needs still arose. Unlike the modification ideas during the divergent piloting period, the modifications during the rollout were not expected or planned for. However, there was no reason to ignore them if they contributed to fulfilling the program objectives. Furthermore, if the improvements made in the middle of the rollout period were relevant also for the cases that had already been implemented, the cases could be revisited for "upgrading" the solutions to the improved ones. Table 24 summarizes the modifications made after the standardization period that are briefly described also in the text below.

Modifications	Reason for modification
Express pipe	When there is no warehouse in the country, availability of right products in exceptional cases of unexpected needs or problems needed to be secured by the express pipe.
New demand planning tool	The interim tool was replaced by a more robust IT system.
Demand planning within the account team and in collaboration with customer.	The basic demand planning process focused on getting the demand data in the right format from the countries to product lines. The process of producing the data within the account team and in collaboration with customers, needed to be defined as well.
Third process option, RDC	Direct delivery lead time was considered too long in some cases, whereas country buffer was not efficient enough to become the main solution. As a compromise, a third process option, RDC, was added as an alternative.
IT system version to enable ordering complete sites	The new IT system version enabled ordering the whole site package as one order, although it included products from several product lines. Previously, a separate order was made for each product line and the orders were co-ordinated manually to ensure availability of the whole site package at once.
Demand-plan adjusted kanban	The initial process of replenishing the country buffers merely based on consumption proved inflexible in network building projects that were in a dynamic stage with extremely unstable demand. As an improvement, the buffer levels were redefined regularly based on the demand-plan.
Operative changes in customer collaboration	Customer collaboration was learnt to be much more than the issues included in the contract. In addition to contractual changes, changes in operative collaboration - working practices, communication practices and responsibilities - needed to be added as elements of the solution.
Performance report and reporting structure improvements	Due to differences in using the IT systems across the account teams, common performance indicators proved extremely challenging. Enhancements in the reports and the reporting structure were made throughout the program lifespan.
Country warehouse closure	Based on the positive results in the implementations, especially after the RDC process was available, the ambition level was raised and closing the country warehouses completely became a target.

Table 24. Modifications and additions to the content of change after standardization.

Operating without a warehouse in the country was perceived risky by many account team members and customers, especially in extraordinary situations of unexpected needs or problems. As a solution, the need for so-called express deliveries was identified already in the beginning of the program, but the capability was reached only after the full-scale implementation had started. The express deliveries provided an even faster delivery than the basic processes, but the use was restricted to avoid misapplication of this less cost-efficient process.

The basic demand planning process had been taken into use in nearly all accounts already before the BIRD implementation, but in many account teams there were weaknesses in the way the process was operated. The basic demand planning implementation had concentrated on gathering the data in the correct format and using it in the product lines. The process of

producing the data from various sources in collaboration with the customer had been left with less attention. As well, a new tool for replacing the interim one was developed and ready for piloting in the beginning of the implementation period. Due to these reasons, there was a need to include further improvement of the demand planning process as an element of the implementation.

Despite the successful outcomes in each pilot, in the other direct delivery case the standard lead time was considered too long by the project organization building the network. To minimize inventories, the products were to be ordered only after it was absolutely positive that the specification of the site configuration would not change and that no delays in getting the site ready for installation would occur. This meant that a short delivery lead time of the products was perceived critical for the overall network building project success. On the other hand, the country buffer process was meant only for exceptionally challenging business cases as it was regarded as a rather costly solution to be extensively applied. Thus, an idea of combining the benefits of the two processes came up: a regional distribution centre (RDC) with a fast rotating non-customer specific buffer close to the main customers. That way fast lead times could be achieved with relatively low inventory costs. At the same time as the direct delivery and country buffer processes were implemented in suitable business cases, a feasibility study for RDC process was initiated. As the results of the feasibility study turned out to be positive, the study was followed by development and a piloting of the process in three implementations, cases D, G and I, and it became one of the basic processes together with direct delivery and country buffer.

The implementation of the direct delivery process was started with an interim solution of ordering the products from different product lines in separate orders and manually integrating the delivery of a complete site package. The IT system version that enabled ordering complete site packages in one order, was finally ready for piloting in autumn 1999. It was piloted in case A after the actual BIRD implementation had already been finished. The pilot was unsuccessful, not due to the system solution itself, but technical infrastructure problems and commitment to operating the process according to the agreed rules. Thus, the pilot account shifted back to the old way of using the system, but within few months other implementations applied the new system solution successfully, and it became part of the standard direct delivery and RDC processes.

After the country buffer pilot in case B with a mature customer, the next implementation was case E, a business case where the customer just started to get the network built in phases. Due to

delays and problems in acquiring and constructing the sites, the demand in the end of each phase was significantly higher than in the beginning. As a result, first the inventory levels in the buffer started to increase and then came a period of shortages, as the buffer was replenished only and always when something was consumed and was thus meant to stay in approximately same level. As the mere kanban control proved to be too inflexible in business cases with very unstable demand, the process was complemented with an additional activity of regularly adjusting the buffer levels based on the demand plan. The kanban-control still remained as the operating procedure in the buffer.

During the implementation it was also learnt that the only concrete changes required in the collaboration with the customer were not the contractual amendments. There were specific ways of planning, working and communicating with the customer that were part of the co-operation. Even though these issues were not formally documented in the contracts – or the practical customs differed from the contractual agreement – it was not possible to change them without a common agreement. These operative changes were recognized and included as part of the change, but the actual solutions had to be defined locally concerning the business case.

The intent was to implement globally defined supply chain performance indicators - inventory value, inventories rotation days (IRD), lead time, delivery accuracy and planning accuracy - in the pilots. It turned out to be relatively problematic as the reporting solution restricted the way to use the IT systems and thus some of the performance indicators were not reported at all, some were based on local measurement solutions and some measurement results were inconsistent and not comparable across the account teams as they indicated different things. As well, there was not a clear reporting structure, except for the inventory value and rotation, which further decreased the motivation of systematic performance measurement. A reporting tool was developed as part of BIRD implementation and enhanced several times, e.g. by moving the reporting to Intranet. As well, the individual reports for gathering the results from the IT systems were modified and improved and even completely new ones were created. Yet, the performance measurement implementation remained a challenge throughout the program and the related objectives, i.e. full coverage and active usage of the measures in management, were never met.

Due to positive experiences especially of the RDC process, the whole target setting of the program was revised as more ambitious: the country-specific physical inventories would be completely ramped down concerning the products included in the BIRD program scope. Thus, the country buffer would be only an intermediate solution that should be replaced by the RDC or

direct delivery process as soon as the account team would be ready for it. Consequently, country warehouse closure was added as an element of the change.

Change Content in Local Implementations

The globally defined elements of the new supply chain process solutions guided the local implementations in achieving the targeted business impact and also set expectations for them. As described earlier in this chapter, some of the elements were further productized and standardized solutions in an explicit format. Others were just recognized as elements requiring change without providing a specific standard solution, but allowing and expecting each rollout team to define a solution appropriate in the local conditions. All the elements included in the final solution made up an extensive and comprehensive holistic change. However, the solutions were developed along the progress of the implementation, which was one of the reasons why not all cases included all the elements as part of the actual BIRD implementation project. Also, in some cases particular elements were not relevant, or a locally acceptable solution within the global guidelines was not found. In other cases the reasons for partial implementation were simply related to failures in overcoming change resistance. An additional and more positive reason for not implementing everything within the BIRD implementation was that certain elements had been independently implemented already before the actual BIRD implementation. Table 25 presents a summary of the elements implemented in various cases, the colour codes explained in the bottom of the table. Cases F, J, L, R and S are not included in the table as the data available is not complete enough.

	A	B	C	D	E	G	H	I	K	M	N	O	P	Q	T	U	V	W	X
Customer proposal																			
Contractual changes							0		0										
Operative changes																			
Demand planning																			
Customer involvement																			
Internal process																			
New tool																			
Site process integration																			
Logistic and project integr.														0		0	0	0	
Order triggering														0		0	0	0	
Milestone follow-up														0		0	0	0	

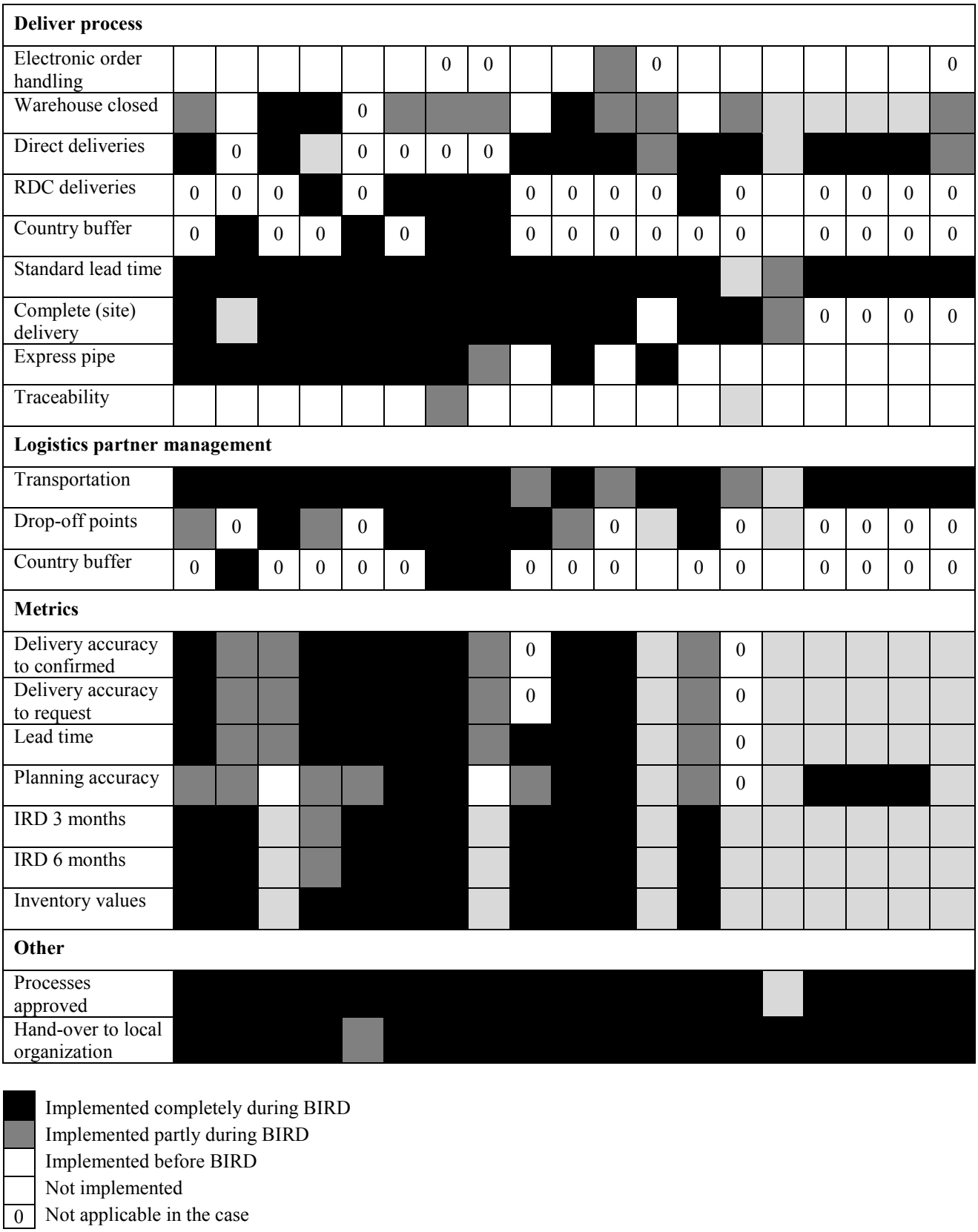


Table 25. Summary of the implemented content of change in the cases.

Although the complete range of solutions was not implemented in each case, each implementation brought the process in the respective account team somewhat closer to the ultimate ideal and thus managed to produce positive change.

The BIRD program combined the characteristics of both the holistic and incremental approaches in a way that eliminated sub-optimization and ensured holistic view to the process, but did not require designing a total solution with all details before implementation. The formal and comprehensive design would have been an extensive effort consuming both time and resources in different parts and levels of the organization before any business benefits could have been realized. Designing the complete content separately from implementation could also have risked the feasibility of the solutions. The target of implementing standard solutions was achieved to a certain level, but not all the operational details were standardized or designed in a formal manner. Rather than being merely holistic or incremental, the applied way of implementation can be described as *systemic* (the term used also by Beer et al., 1990a) as it does consider interrelationships and dependencies between the elements, but still allows developing the solutions and achieving the targets incrementally concerning both the completeness of the solutions and the coverage of the change.

The systemic change advancement in the BIRD program can be summarized by the following characteristics:

- Solutions developed in diverse pilots based on generic initial content
- Based on the pilots, solutions standardized and completed to a concrete level
- The standardized solutions implemented throughout the organization and further improved, if needed
- Content of the change cross-functional (e.g. contracts, demand planning, metrics, delivery processes, IT systems) and cross-organizational (account teams, product lines, customers, logistics service providers).

6.6 Success of BIRD

As defined in Chapter 3.1, the success of the BIRD program is evaluated based on the supply chain performance improvements gained during the program. The specific supply chain performance indicators used consist of inventory value representing productivity, lead time and customer satisfaction.

Inventory

As inventory level was the dominant indicator followed during the implementation, a relatively detailed evaluation on the inventory values is first presented. The inventory level is presented both as the actual inventory value and as inventory rotation (IRD) that presents the inventory value in relation to sales volumes: how many days' sales would be covered by the inventory. To smoothen fluctuations, IRD is calculated as an average of three months using the following formula:

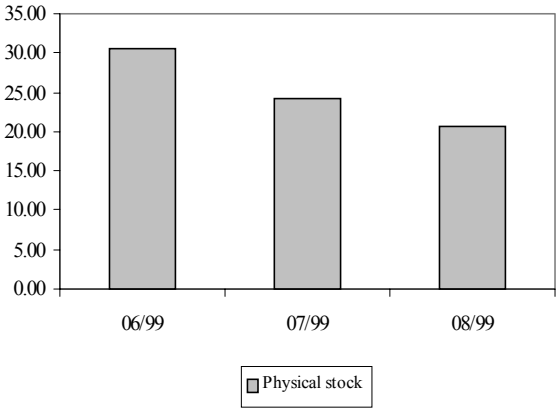
IRD = 365 d / 4 * average inventory of past 3 months / sales of past three months.

The overall success of the program is indicated by the overall 50% IRD decrease in EMEA 1999-2000, which was the extent of the BIRD program. This overall IRD value covers a larger scope than the BIRD program and is thus only indicative; it includes all EMEA accounts, not only the ones were BIRD was implemented and all products instead only the BTS site products that were according to the BIRD scope. However, as noted in the case instruction, these products make up a significant part of the overall volume.

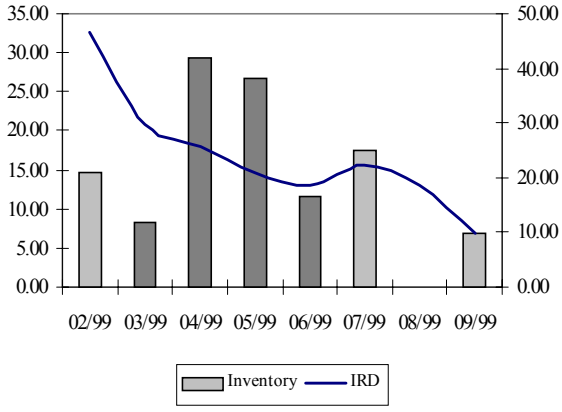
To further specify the inventory reduction in the different cases during BIRD implementation Figure 16 and Figure 17 illustrate the inventory and IRD values in the cases. The cases are grouped to a) clearly successful ones based on a significant decrease of inventories or a very low level of inventory in general (Figure 16) and b) other cases where there is no significant or clear improvement or the inventory levels remained high despite of clear improvement (Figure 17). Case V is not included as due to the contractual settings, the inventory values in the case are reported in a way that does not correspond to supply chain performance. The scale in the tables does not correspond to the actual values, but indicates the inventory levels and IRD in relation to other cases. The values are on monthly basis and the charts include the month before starting the BIRD implementation, the time of the actual BIRD implementation highlighted and a three-month follow-up period after the implementation.

Successful BIRD Cases

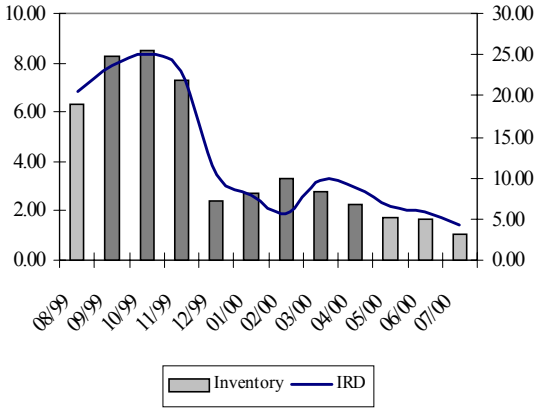
Case B



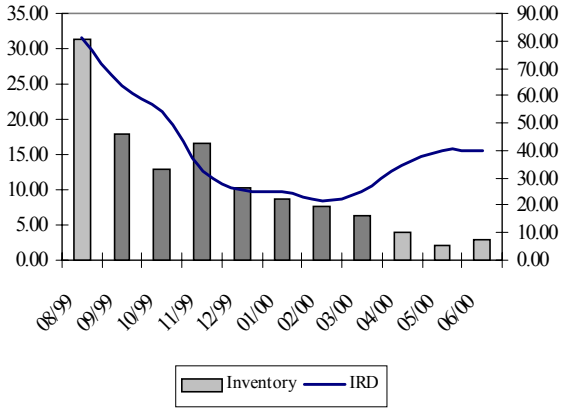
Case C



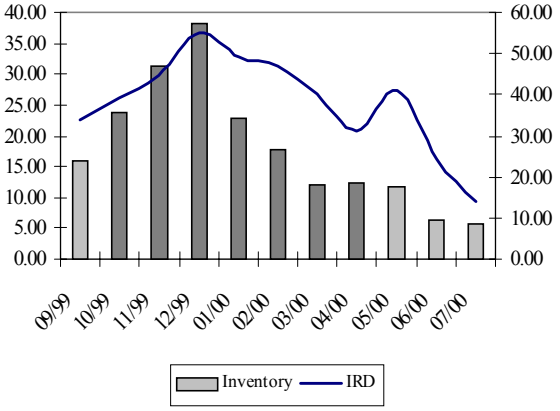
Case D



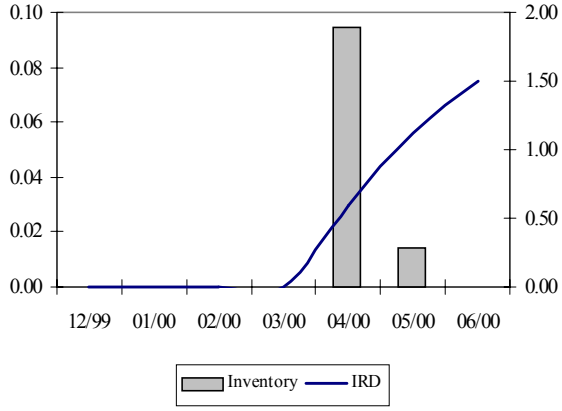
Case G



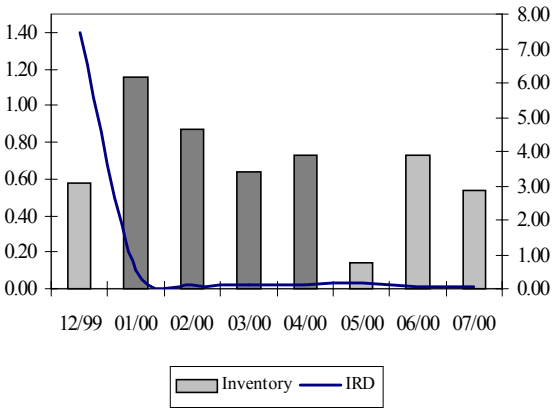
Case I



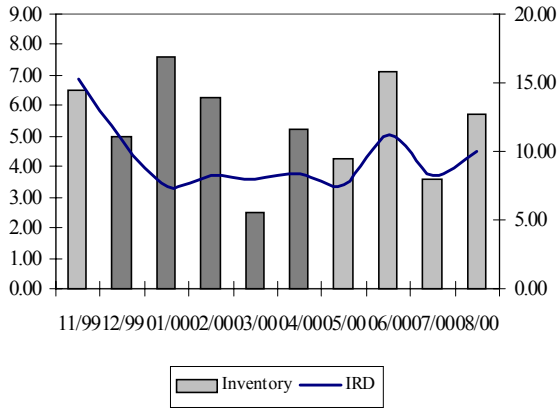
Case J



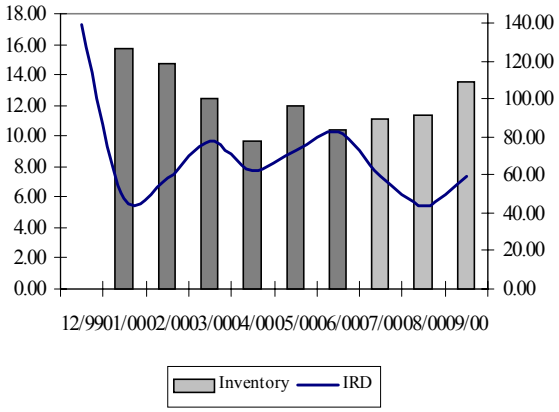
Case K



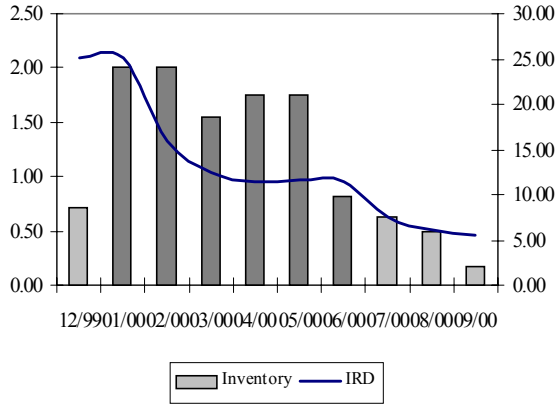
Case L



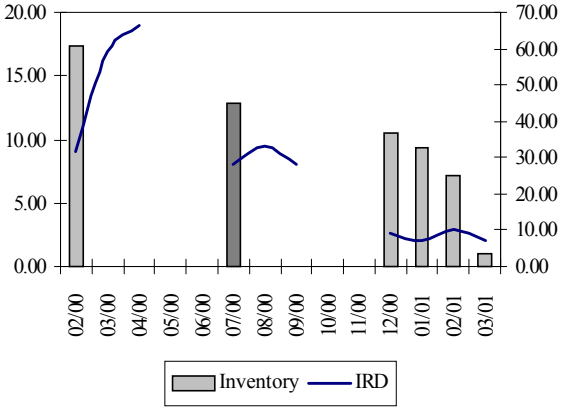
Case M



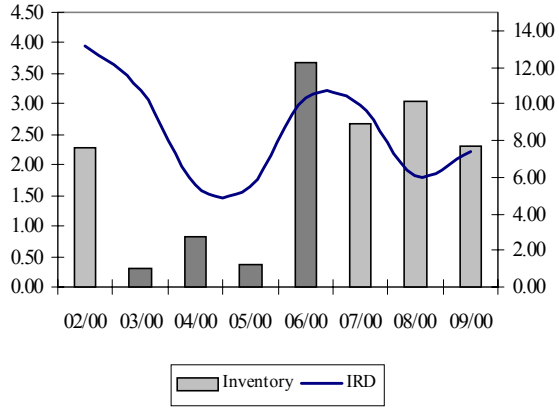
Case N



Case P



Case R



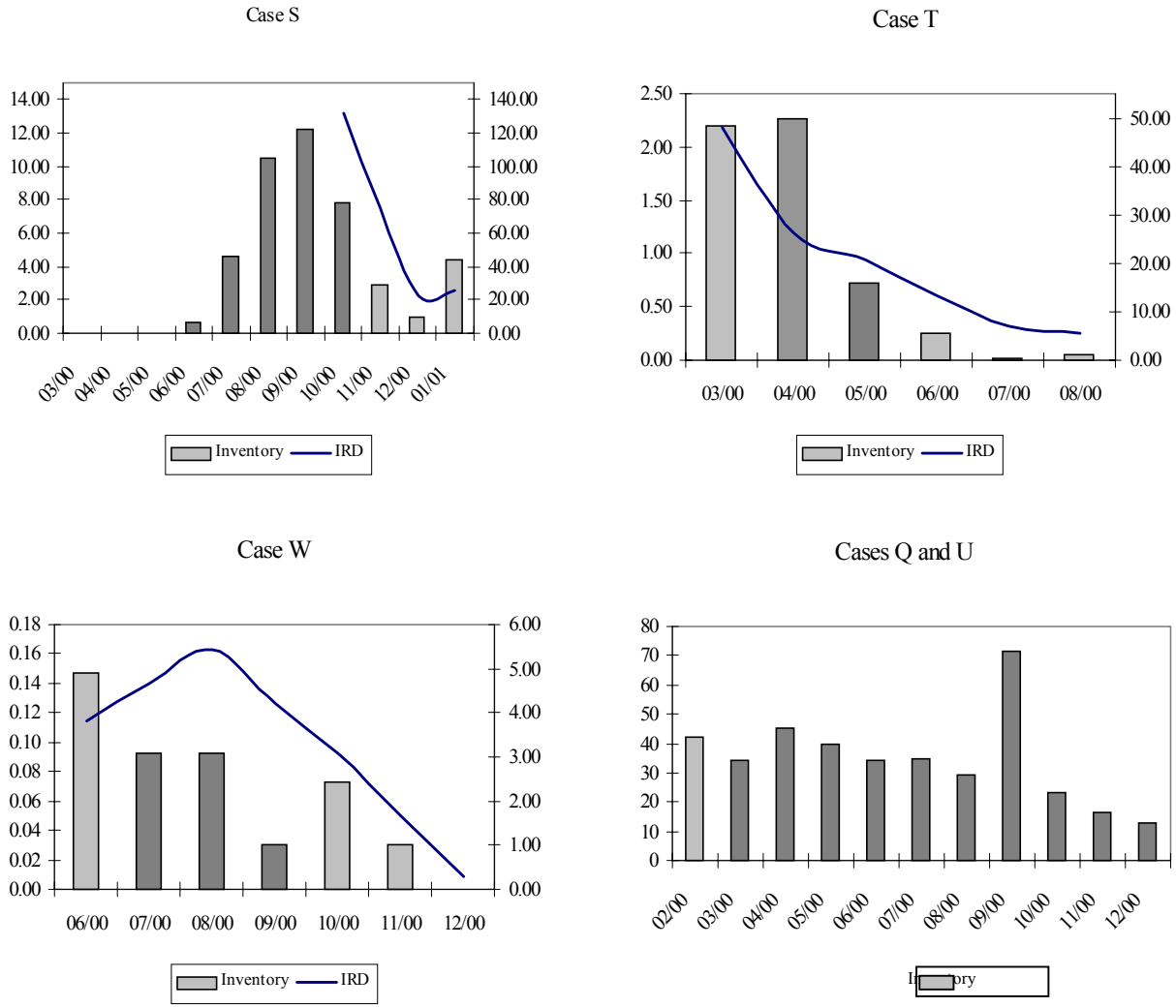


Figure 16. Inventory progress (on a relative scale) of successful BIRD cases.

The charts illustrate how quantum improvements were achieved in most (17) of the cases. In many of them, both inventory value and IRD decreased to a fraction of the original value. For cases B and P, the data is incomplete: in case B the performance improvement is indicated only by the physical stock value as a significant part of the overall inventory value and only during the follow-up phase and in case P a longer time frame is included due to the missing months in between. Case J was a new customer project starting at the same time with the BIRD implementation, which explains the inventory increase. Yet, as the overall level remained very low, the case can be considered successful. The inventory values for cases Q and U are combined as one, as the data used does not enable separating them. As well, the time frame for cases and U does not include the follow-up period.

Other BIRD Cases

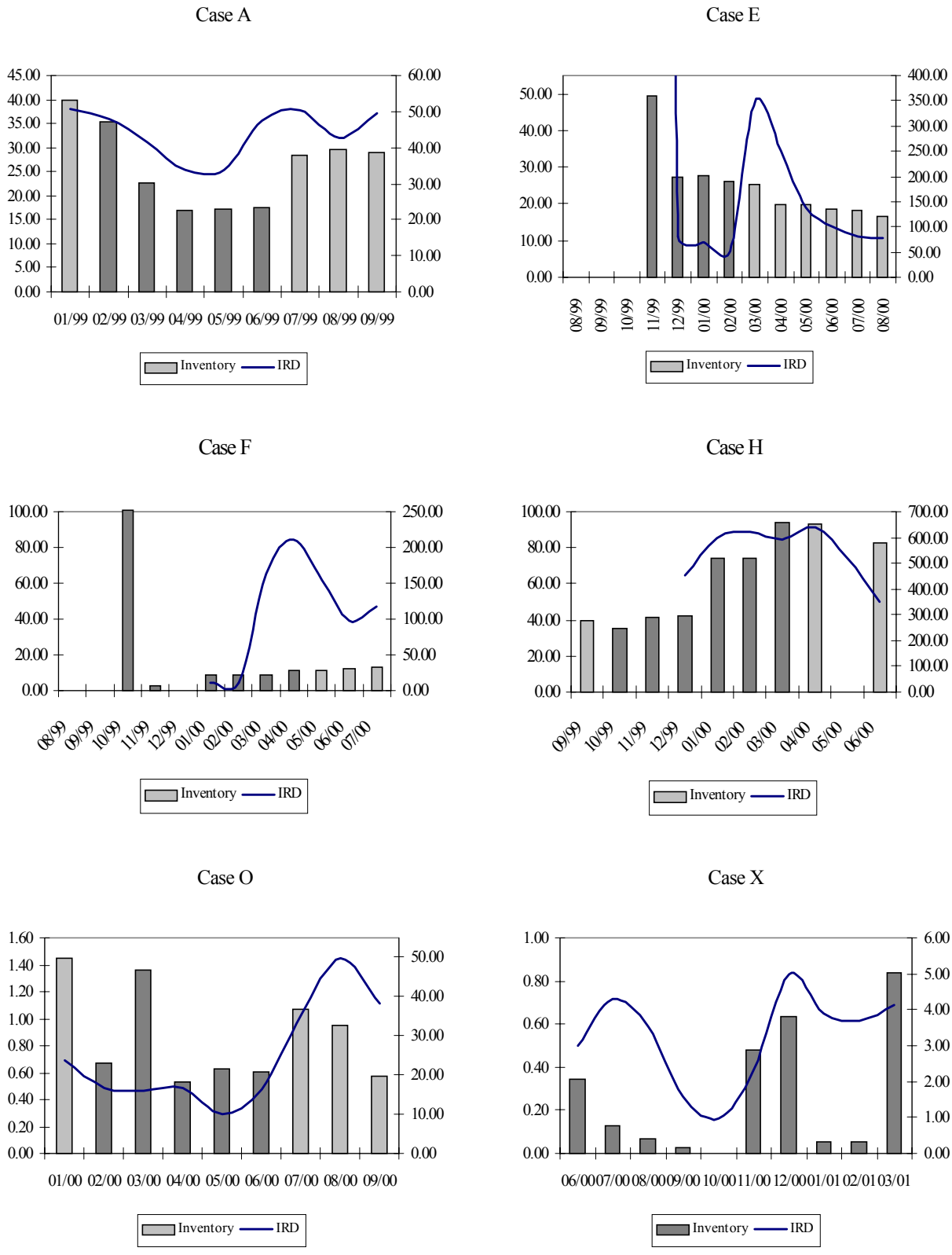


Figure 17. Inventory progress (on a relative scale) of BIRD cases with no clear improvement.

In cases O and X there was no clear improvement, but the overall inventory values are low, which causes high relative fluctuations and makes it difficult to identify the impact of BIRD. Anyhow, due to the low values the cases can hardly be considered as failures. In case A, the inventory level started to decrease during BIRD implementation, but after the actual implementation the positive trend changed. In case E, after the rapid inventory increase in the start-up of the customer case, the inventory levels started to decrease. Yet, the level was still high in the end of the BIRD implementation and follow-up period. The same applies to cases F and H. Cases E, F and H represent specific business cases with different type of contractual agreement. During BIRD implementation it was learnt that mere supply chain performance has a limited impact on the inventory level in this type of cases. Thus, further development is required to define improved solutions for the specific type of business case.

Lead Time

The BIRD program managed to standardize the lead time of a complete delivery of BTS site products depending on the supply chain structure, direct delivery, RDC or country buffer. Before the program, the lead times had not been standard across and even within a product line. One product line served some customers with the short lead time already before the BIRD program, but concerning some products the lead time could be 7 to 8 times longer than after BIRD implementation as illustrated in Table 26. The lead time here indicates the time between the order from the account team to product line and the arrival of the product delivery to the specified address: drop-off point, country buffer or customer warehouse. Thus, it is not necessarily the same lead time that the customer sees, as the customer orders may be arrive in advance to the account team, delays in the customer's or Nokia's site process may affect the lead time and in the country buffer cases the customer is served from the buffer, not from the product line directly. The internal lead time is used as more complete data were available for it and the values across the cases are better comparable. Due to the limitations in data availability, the lead time reduction in the table is based on the agreed lead times without consideration of delivery reliability.

Lead time reduction in BIRD cases		
Case A: 0-67%	Case I: 57-91%	Case Q: 0-50%
Case B: 50-75%	Case J: -	Case R: 33%
Case C: 22%	Case K: 67%	Case S: -
Case D: 57-86%	Case L: 0	Case T: 0
Case E: -	Case M: 0-50%	Case U: 57%
Case F: -	Case N: 0	Case V: -
Case G: 57-89%	Case O: 67%	Case W: 67-75
Case H: 65-77%	Case P: -	Case X: 0-67%

Table 26. Relative lead time reduction in BIRD cases.

Customer Satisfaction

Customer satisfaction is evaluated based on the data in the generic yearly Nokia customer satisfaction survey. The first survey carried out after the local BIRD implementation is used. The elements of the survey indicating satisfaction to Nokia supply chain performance include the following elements:

- The respondents' opinion on whether Nokia's performance when delivering or expanding the network has improved, stayed the same or declined
- Relevant comments related to BIRD implementation on free format.

As an indication of customer satisfaction, Figure 18 shows the share of the customer respondents that considered Nokia's delivery capability to have improved, stayed the same or declined during the previous year. In addition to the supply chain performance, the question about the Nokia deliveries embeds also the customer's satisfaction in Nokia's management of the site process and the overall network building project, so the measure is only indicative. However, as the question is exactly about the performance change within the time of the local BIRD implementation, it is considered as the best one to illustrate impact of BIRD. Cases H, J, K and T are not included in the figure as the data was not available.

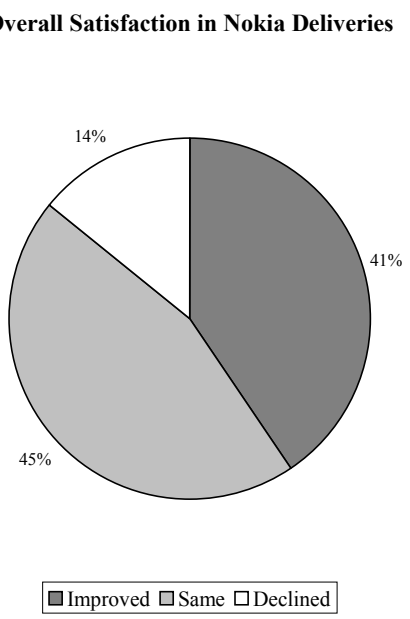


Figure 18. Overall customer satisfaction in Nokia deliveries.

Comments related more specifically to the impact of the BIRD program are listed in Table 27 in free format. Only the cases where BIRD related issues are specifically mentioned are included. The comments indicate the overall satisfaction to the changes in the supply chain process, especially the shorter lead time. As a negative outcome, some customers perceived lack of flexibility as a result of ramping down the country inventories and having a more standardized way of working.

Case B	Logistics has improved significantly during last year and is better than Nokia's competitor.
Case D	Performance when delivering and expanding the network has improved since changes in the logistics system. However, there is a feeling that Nokia has optimised its own delivery systems, but does not take into account the customer's reality, and shifts the burden to the client. The customer comments also that sometimes delivery schedules are so tight that there is no room for flexibility needed in dealing with the realities of site construction.
Case G	The customer is impressed with the new equipment delivery system (BIRD), which Nokia has recently introduced. The quality of the network building project has improved. For the customer, the new equipment delivery system called "bird" looks very promising and should help to avoid delivery problems. "Bird" looks like a win-win situation for both sides.
Case I	Delivery and lead times are improving and are better than stated in the contract. The customer appreciates that Nokia is working hard to improve the lead times and acknowledges the good results that have been achieved. However, some contradictory comments are made by different respondents: one perceives no problems with delayed deliveries or responsiveness to changing plans, whereas another claims that there has been problems with late deliveries that Nokia claims to be due to wrong forecasts and the customer respondent disagrees. The lack of a local warehouse for ancillaries is perceived as inflexible and a cause for some delays.
Case L	Nokia is not able to meet the customer's requirements in terms of supply. Internal communication between Nokia logistics and installation teams in perceived as not working. The overall project delivery is delayed and the customer blames the project manager being inexperienced. Contradictory comments on logistics: one perceives that logistics needs improvement, another one that Nokia is flexible in logistics and it has an interesting approach that the customer is pleased with. The reliability of Nokia deliveries is perceived better than other suppliers'.
Case M	Nokia is considered able to deliver on time and very good at logistics. However, the lead times fixed in the contract are considered rigid without a possibility to negotiate. Availability problems with a specific product were noted.
Case N	There has been improvements to delivery systems during the last months. Nokia has introduced a new delivery concept. It is now possible to have a just in time solution and the ordering procedure was also improved.
Case O	The customer comments Nokia's logistics system as good. However, the customer would like Nokia to have some critical items in stock.
Case P	Satisfaction shows a slight gain on the year. Nokia's ability to adapt delivery schedules to meet their company's needs get high scores from two respondents. As well, Nokia's deliveries concerning the products relevant from BIRD program point of view are perceived very reliable. However, the customer is not happy with the delivery of product documentation.
Case Q	In general, the customer considers Nokia to keep the agreed delivery schedules. Customer is not satisfied with the lead times they see, which for some reason is a lot longer towards the customer than the standard BIRD lead times. Not surprisingly, the customer is requesting significantly shorter lead times and more flexibility. The head office considers decentralized purchasing according to the demand in regions as a drawback.
Case R	The customer is happy with deliveries from Nokia and sees that the performance within last months has improved. However, they are not satisfied with their own inventory that is needed for site consolidation of deliveries from two suppliers.
Case S	The customer has been very pleased with Nokia's logistics (lead times, reliability) that they consider as improved, Nokia being more satisfactory than other suppliers. Some positive comments are expressed also on Nokia's ability to deliver on a short notice, but even shorter lead times for emergency installations are called for.
Case V	Nokia is considered to meet the customer's targets "90% of the time regarding deliveries". Delivery is fine for "standard" products, but getting extra requirements fulfilled is perceived troublesome.
Case X	The main issue is the need for timely delivery. The customer considers that Nokia is keeping promised time schedules, and is quite satisfied with performance.

Table 27. Customer comments on Nokia's supply chain performance.

Based on the presented performance indicators, it can be considered that the BIRD program did achieve clear improvements in supply chain performance. Especially the improvements in inventory levels are significant and they were not achieved on the cost of customer satisfaction, which actually simultaneously improved in many cases according to the direct customer feedback. As a drawback, the more standard way of operating was perceived as some decrease of flexibility. What comes to the question whether the benefits outweigh the time and resources spent for implementation, it must be concluded that separating BIRD related work from related operative activities is not easy as most of the work was carried out beside other responsibilities of the people. Compared merely to the savings from the quantum inventory reduction, the costs of the few full-time resources remain low. In addition, the increased customer satisfaction is invaluable. Thus, the BIRD program can be concluded as successful.

As the success evaluation here focuses on the actual implementation of the BIRD, a final note on the sustainability of the change is made. In some cases, problems to keep up with the achieved performance level were encountered, especially in the end of 2000. At that time, a lot of changes in responsibilities related to the operative supply chain management were made. As well, there was a global shortage of certain key components, which had an effect to the reliability of the deliveries. These problems demonstrate that focused management is needed also after the actual change implementation and further development on the issues continues.

7. COEVOLUTIONARY APPROACH FOR IMPLEMENTING ORGANIZATIONAL CHANGE

The case described an approach to change implementation that complies neither with the planned nor the emergent change model, despite of many common elements. Based on the case, a new implementation approach – here labelled as *coevolutionary change* - can be conceptualized. This chapter summarizes the findings from the case study and concludes how they relate to the existing implementation approaches, planned and emergent change. Finally, the findings are reflected with the enfolding literature that also provides the reasoning for the term coevolutionary. Table 28 presents the characteristics of the approach to change implementation applied in the case and highlights how the initiation, management structure, process and change advancement in the case differ from both the planned and emergent approaches.

Coevolutionary Change	
Initiation	**Challenge**
	• Explicit business-relevant goals for setting the direction • Measurable targeted performance level for ensuring focus • Local implementation initiation (timing and targets) fitted to the situation • In addition to the generic objectives, the specific changes required in each implementation defined in the initiation.
Management structure	**Co-ordinated, but decentralized**
	• Light central management to ensure progress and consistency across implementations • Local rollout teams to provide knowledge on local context and every-day work • Autonomy of the parties (program and the rollout teams) for utilizing the knowledge of the local members • Two-way influence between the parties (steering group, program management, rollout teams) to ensure exploiting local knowledge throughout the program.
Process	**Dynamic**
	• Schedules and milestones as a basis for implementation activities • Longer-term plans open or suggestive and completed and revised according to progress • Process subordinate to change objectives. Activities may overlap and iterate, if it contributes to better results.
Change advancement	**Systemic**
	• Solutions developed in diverse pilots based on generic initial content • Based on the pilots, solutions standardized and completed to a concrete level • The standardized solutions implemented throughout the organization and further improved, if needed • Content of the change cross-functional (e.g. contracts, demand planning, metrics, delivery processes, IT systems) and cross-organizational (account teams, product lines, customers, logistics service providers).

Table 28. Characteristics of the coevolutionary approach.

7.1 Initiation

Existing theory is consistent about the importance of the perceived need for change as a source of motivation and condition for success. In planned change the need is corporate-wide and stems from a vision of the organization as a result of the change, defined mainly centrally by management. In emergent change, the need is perceived by each employee as he or she observes problems or opportunities for change in every-day work. The underlying difference is that planned change aims at having a commonly perceived need among all stakeholders, whereas in emergent change the need is individually perceived. Whereas a vision describes the target state, it may not imply how operative, concrete actions relate to reaching it: how can an individual employee know whether his or her actions contribute to achieving the vision or how reaching the vision affects the problems currently at hand. However, a common vision prevents from sub-optimization, which may be a problem in the emergent change implementation where all organizational members initiate changes according to their observations.

Rather than being guided by an abstract overall vision or individual everyday problems, coevolutionary change implementation is guided by a strategic challenge that can be evidently related to the organization's business performance. The challenge drives change towards a certain performance level, but not necessarily towards a specific design of the target state. Vollmann (1996) also views organizational change as a strategic response to a challenge; a challenge expresses the particular reason for a change and thus the direction it needs to take. To make the need more concrete and relevant for all stakeholders in a large organization, the challenge is extracted to specific targets and objectives retrieved from the local situation, problems and opportunities when initiating local implementation. Thus, the specific objectives in the different organizational units may not be identical, as long as they contribute to meeting the common overall challenge. A challenge guides towards action, as well as ensures that the change is relevant not only for the corporation, but also for its sub-units and finally individuals.

The challenge should be broad enough to foster new ideas, but concrete enough to make people understand how they can contribute to it and how it changes their work. As Reger et al. (1994) suggest, change should be driven by a gap between the current and ideal organizations, which is wide enough to make the change seem necessary, but still attainable without devitalizing stress. Challenge as the basis of change initiation also relates to the concept of "strategy as stretch" (Hamel and Prahalad, 1993). Considering strategy as stretch helps to bridge the gap between seeing strategy as a grand plan thought up by great minds versus seeing strategy as no more than the pattern in a stream of incremental decisions. Strategy as stretch involves design, as top

management needs to have a clear strategic intent as the focal point that converges the actions, efforts and decisions. Yet, it also involves incremental implementation and thus recognizes the paradox how leadership cannot be planned for, yet a grand and well-considered aspiration is necessary.

Day and Jung (2000) also call for change that is both highly personal, arising from real-life experience, and yet has a common direction. Motivating change by a challenge thus aims at balancing the "push" and "pull" to change, which is consistent with Beer et al. (1990), who advice implementing change in organizational units in a way that avoids perceptions that it is being pushed from the top, but at the same time ensures consistency of the changes. As Hall et al. (1993) put it, change initiation should be a combination of persistency towards performance objectives with an attempt for building consensus at all organizational levels. A business-relevant challenge – translated into specific objectives according to the local situation – may at best provide both common direction and focus, yet be concrete and relevant to most stakeholders.

7.2 Management Structure

Top management support as a criteria for successful change is as well recognized by both planned and emergent implementation approaches. In *planned* change, top management has overall responsibility for making the change, whereas in *emergent* change its role is rather to create the conditions for change to be made by all employees. In the *coevolutionary* approach, implementation is managed in a *co-ordinated, but decentralized* manner. Co-ordination is achieved by having global or central instances in the management structure, such as a steering group and program management team. The responsibility of the local implementation is then decentralized throughout the organization. Both the global and local instances of the management structure have their important and specific roles, the former ensuring consistency and synergy and the latter providing knowledge on every-day work and the local context of the change.

Consistently, Beer et al. (1990) emphasize how even in a centrally led effort the local unit level implementation is important and enables achieving the benefits of both top-down and bottom-up change. Pasmore (1994) agrees that maximum flexibility is attained when each individual is free to do his or her own thing, but organizational synergies are gained from sharing resources, pursuing common strategies, and working together interdependently, all of which require some centralized control. Thus, the aim is to maximise both control and delegation through the

creation of integrative mechanisms that allow people to do their own co-ordinating. Davenport and Stoddard (1994) also note that whereas it is beneficial to design the details of new processes by those who do the work, innovative designs for broad processes unlikely come from anyone who is too deeply focused in the existing processes.

In coevolutionary change, not only implementation responsibility is decentralized, but also the ability to influence the solutions, implementation plans and decisions. The two-way relationship between the central and local instances implies that employee involvement is considered important not only for overcoming employees' change resistance by educating them or affecting their feelings. Involvement is especially important because the members of the central management do not know all the details and interconnections related to the solutions and their practical implementation. Thus, resistance is overcome in a natural way by exploiting the experience and knowledge of the local members and improving and concretizing the solutions together so that the implementation actions seem sensible.

Liedtka and Rosenblum (1996) also suggest that not only implementation should be local, but also shaping and definition of the targets and solutions should be iterative and on-going using local knowledge. To pull the local capabilities back together into a coherent institutional intent, they suggest strategic conversations among the stakeholders. Duck (1993) confirms how one of the most important aspects in managing change is managing the conversation between the people leading the change effort and those who are expected to implement the new strategies. Accordingly, Nonaka and Takeuchi (1995) present how new knowledge is created through interaction between individuals and organizational entities, being most effective when benefits of a top-down, hierarchical organizational structure are integrated with those of a more flexible bottom up approach. To sum up, managing change implementation in a co-ordinated, but decentralized manner involves the central and local organizational instances, whose relationship is both autonomous and two-directional.

7.3 Process

The implementation process of the case is neither linear as according to *planned* change nor continuous like in *emergent* change. The process is not about executing a predefined plan, which is completed as a separate step in the beginning of the effort. Nor is it a continuously on-going and repeating cycle responding to observed needs for change without any pre-planning. In the *coevolutionary* approach, the dynamic implementation process does involve schedules and milestones as a basis for action, but plans for longer term are open or suggestive. The plans are

completed and revised according to the progress - both in explicitly agreed and predefined occasions such as pilot completion or end of the corporate strategy definition period and as the need arises. Consistently, Brown and Eisenhardt (1997) emphasize the importance of limited structures as a finding of their study on product innovations. The study shows how successful managers neither rely on a single plan of the future nor are they completely reactive. Limited structures are important, as long as they are not too extensive as in projects that are planned out with work broken down into small tasks and then passed through a structured sequence of steps with the objective of efficiency. As well, a too unstructured way of working leads to unclear responsibilities, problems in accountability and thus to enormous time wasting.

Changing plans constantly is not an ideal in the dynamic implementation process, but as Hall et al. (1993) note, a fatal mistake in a change effort is to measure its success only against the original plan. In the dynamic change process, plans are subordinate to the change objectives and thus replanning and additions are not considered a failure if they contribute to better results of the change. In a large-scale change it just isn't possible to know exactly all the needed activities, their duration and interrelations beforehand. It is therefore better to leave the plans partly open than to do extra work by trying to make guesses. Moreover, even if a plan seemed perfect when completing it, unexpected changes outside of the change program members' control may make it invalid or out-of-date.

As Nadler and Tushman (1989) state, profound organizational reorientation does not occur by accident, but is a result of intensive planning. On the other hand, it is naïve to believe that reorientation in an uncertain environment can occur by mechanistically executing a detailed operating plan. Successful reorientations involve a mix of planning and unplanned opportunistic action and as a consequence, effective reorientation seems to be guided by a process of iterative planning; that is, the plans are revised frequently as new events and opportunities present themselves.

7.4 Change Advancement

The *planned* implementation approach considers organizational change to begin with a complete and holistic design of the solutions to be implemented throughout the organization. Quite the contrary, the *emergent* approach views change as an accumulation of incremental, more or less individual changes. According to the *coevolutionary* approach, change is *systemic* in a way that it can be built up incrementally, yet considering the interrelationships between the various organizational elements and the overall challenge. The systemic change advancement is related

both to the order of implementation in different organizational units as well as the solutions to be implemented. Thus, the advancement is systemic in terms of the coverage of the implementation as well as the level of detail and completeness of the solutions.

When change advancement is systemic, implementation can be started as soon as some units are ready for it. As well, it can be started from the elements of the solution that are available for implementation without waiting for a comprehensive design covering all elements of the solutions in detail. Davenport and Stoddard (1994) give an example of a communications company that designed a single best process for order fulfilment, but the different regional business units implemented it on a piecemeal basis, adopting first those aspects of the design that addressed their most pressing problems. Consistently, Beer et al. (1990a) consider successful organizational change as a series of changes in targeted smaller units such as individual manufacturing plants and divisions. However, the order of the partial implementations needs to be logical bearing in mind the systemic effects. For example, starting to implement shorter lead times in the customer interface may not make sense if the supplying plants are not yet capable for faster deliveries.

Whereas Beer et al. (1990a) call for incremental implementation in unit level, Quinn (1980) suggests an incremental process also for defining the solutions. Instead of rigid and bureaucratic formal planning based on sophisticated models, he sees effective strategies to emerge step by step as the organization probes the future, experiments, and learns from a series of partial, incremental commitments. The organization modifies the conclusions from broad conceptions towards specifics and thus learns from a series of partial commitments. Rather than relying on globally formulated total strategies, the quality and impact of each of the subsystems' strategies is improved as more information, confidence, and personal commitment are achieved. Though an incremental pattern of action is followed, continual attempts by the top management is required to integrate the actions into an understandable, cohesive whole. (Quinn, 1980) Consistently, Nonaka and Takeuchi (1995) demonstrate that continuous innovation stems from iteration and interaction of informal, experience-based tacit knowledge and explicit knowledge.

Similarly, the systemic change advancement refers to an iteration between conceptualizing the generic solutions and developing the practical content. The systemic change advancement is an interplay between divergent activities for creating the practical understanding and convergent activities of conceptualizing the understanding to explicit solutions. Thus, it is much about learning. As soon as some ideas and guidelines about the solutions exist, they are piloted in real-

life context for testing the feasibility and understanding the details in practical level. Based on the piloting, generic solutions are standardized and worked towards a more concrete level for further implementation, yet open for improvements and complementary elements based on further learning during implementation. Conceptualizing and standardizing the piloted solutions is essential for approaching a holistic solution that is generic and not too much biased towards the specifics of individual pilot cases. Standardization also ensures that the same problems are not solved repeatedly and in the worst case in different ways. Thus, the systemic change advancement differs from merely incremental in a sense that it is not only an accumulation of individual changes, but holistic change that results from integration of the incremental changes. Integrating the incremental changes involves ensuring that the changes in different organizational elements comply and contribute to the overall objectives rather than contradict with each other.

7.5 Concluding the Coevolutionary Approach for Change Implementation

The description of the new implementation approach provides the basis for assessing it. Table 29 reflects the evaluation of the extant planned and emergent change implementation with the new approach and illustrates how it enables combining the strengths of both extant approaches and yet avoids the weaknesses, which in a rather straightforward way counted as the negations of the strengths of the other approach as concluded in Chapter 5.3.

		Coevolutionary Approach
Initiation		**Challenge**
	Planned implementation: Designed vision	• Common direction • Focus
	Emergent implementation: Problem or opportunity	• Relevancy • Concreteness
Management Structure		**Co-ordinated, but decentralized**
	Planned implementation: Central	• Control • Synergy
	Emergent implementation: Local	• Exploitation of knowledge on operative activities and local context • Commitment of employees
Process		**Dynamic**
	Planned implementation: Linear and sequential	• Systematic • Guides to action
	Emergent implementation: Continuous	• Responsive to changing conditions
Change advancement		**Systemic**
	Planned implementation: Holistic	• Consideration of interrelationships
	Emergent implementation: Incremental	• Learning through incremental changes • Enables partial solutions

Table 29. Strengths of the coevolutionary approach in relation to the planned and emergent approaches.

As the approach combines the strengths of both planned and emergent approaches, it contributes to answering the calls for incorporating the extreme views of change management: top-down, externally driven, imposed, central and lateral change in contrast with, organic, endogenous and local change (e.g. Hendry, 1996; Shaw and Walton, 1995). Also Liedtka and Rosenblum (1996) see strategy making as a process of continuous adaptation that looks for a balance between offering too much or too little direction and between the benefits of autonomy without losing the benefits of scale and scope. Accordingly, Mintzberg and Westley (1992) note that much important organizational change is simultaneously deductive and inductive, proceeding both from conceptual to concrete and vice versa. Burgelman (1994) views strategic renewal as alignment of the unavoidable mismatches between an organization's official strategy and the actual strategic actions, carried out as a coevolutionary process (see also Burgelman and Grove, 1996). Hendry (1996) comments this incorporation by pointing out how the inertia that occurs through normal processes of becoming organized, is as critical for the management of change according to planned change as it is for organizational learning and thus emergent change. Lampel and Mitzberg (1996) advise to look for some middle ground in between the logic of aggregation and the logic of individualization, which they consider as the dominant strategies for managing products, processes and customer transactions. The logic of aggregation refers to

emphasizing economies of scale and efficiency through standardization, whereas the logic of individualization focuses on fulfilling the various needs of each individual customer.

Brown and Eisenhardt (1998) link the dilemma of balancing between the two extremis to complexity theory, according to which change is most effective in systems with some, but not too much structure. Complex adaptive systems are made up of multiple interacting agents and if the agents form a too tight configuration, the system becomes rigid and stagnated with too little variation that enables adapting to changing environment. As an example of this phenomenon, Brown and Eisenhardt (1998) mention centrally planned economies like the former Soviet Union. In the other extreme the threat is the so called complexity catastrophe: the agents of a system are too little or too loosely structured and the system becomes chaotic. In a chaotic system the numerous interconnections between the agents make it difficult to control the effect of individual agents on the whole system. As a result, there is no coherence and it is difficult to co-ordinate or direct change. The idea of balancing between too much and too little structure is based on Kauffman's (1995) studies on biological systems and genetics where the fundamental difference between chaos and rigid order is the number of interconnections between the agents of the system: the more interconnections, the more chaotic the system becomes. For Brown and Eisenhardt (1998) who apply the theory in strategy making in organizations, rigidity and structure stem from more qualitative features like the organizational configuration and discipline. Thus, in the context of organizations, the agents' possibility to affect the overall system seems more relevant than the number of interconnections between them.

In between the two extremis, there is an intermediate zone, edge of chaos, where a system never quite settles into a stable equilibrium but never quite falls apart, either. In the edge of chaos, the system effectively changes to stay fit in relation to its constantly changing environment. The edge of chaos is characterized by some, but not too much, structure. Kauffman (1995) defines the edge of chaos as "a natural state between order and chaos, a grand compromise between structure and surprise". The edge of chaos fosters *coevolution*[5], a process where the system changes as its agents interact with agents of other systems. In other words, the agents coevolve as they influence the systems that they adapt to. (Kauffman, 1995; see also Tossavainen, 2001)

Applying the complexity theory, Brown and Eisenhardt (1998) introduce a strategy model for high velocity industries, "Competing on the Edge". The model is about creating an organization

[5] The embedded term evolution does not refer to the pace of change like in some theories of organizational change, but to the process of variation, retention and selection.

that can continuously change and allow competitive advantages to emerge to form a semicoherent direction. Competing on the Edge strategy is about finding a fruitful balance between the extremis of chaos and order to combine in strategic management both economies of scale and flexibility, synergies through standardization and individual success, efficiency and innovation. (Brown and Eisenhardt, 1998) Figure 19 illustrates the building blocks of this strategy model including the pitfalls to be avoided when balancing between the extremis. The related concepts of the complexity theory that are relevant for this study are as well included in the figure.

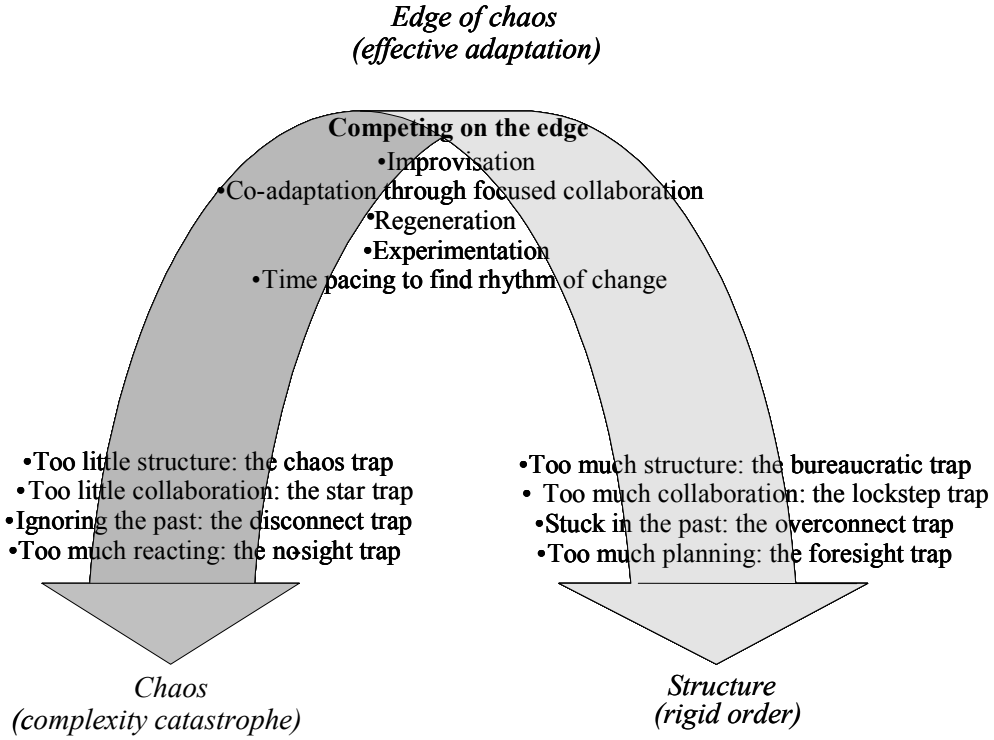


Figure 19. Competing on the Edge strategy and edge of chaos (adapted from Brown and Eisenhardt, 1998).

Similarly, the change approach manifested by the case evidence can be seen as a balance between emergent change approaching the chaos extreme and planned change approaching the rigid order extreme. As *emergent* change is about an accumulation of independent changes initiated throughout the organization based on observed problems and opportunities, there is *little structure* in the approach. The individual changes in one part of the organization are not directed by any overall vision. Relationships among the actors of different local sub-organizations and between the local and any global instances of the change implementation are not structured, but rather ad hoc. The continuous change processes operating throughout the organization are not co-ordinated by any overall plan and the incremental changes are not part of

any holistic design. The approach enables capitalizing the knowledge throughout the organization, is responsive to changing conditions and to differing needs. The benefits are flexibility, success of individual activities and innovation, but at the cost of efficiency through missed economies of scale and synergy.

On the other extreme, in *planned* change, all change activities are directed by an overall vision and the people implementing the change form a hierarchical organization controlled by central management. The implementation processes are guided by a comprehensive plan making it difficult to adjust to changing needs or conditions. As well, the solutions form a holistic design that determines all the individual changes. The planned approach provides a common direction for each part of the organization, control through central management and possibility to efficiently share the solutions and methods across the sub-units once created. As well, a systematic process is more easily explicated and thus disseminated throughout the various units of the organization and holistic implementation prevents from sub-optimization. Thus, the strengths of the planned approach count as efficiency through economies of scale and synergy benefits, but it lacks of flexibility, innovation and ability to fulfil differing individual needs.

In contrast, the *coevolutionary* implementation approach conceptualized in this study incorporates *some structure*, yet leaving room for flexibility and adaptation. Change initiation based on a challenge is about a balance between predicting the future by exhaustive design of a vision and chaotic reacting to the problems and opportunities emerging in the environment. The co-ordinated, but distributed management structure then meets the challenge of taking advantage of the synergies across the organizational units and yet maintaining enough independence so that the unique and changing needs of the particular units can be successfully met. The dynamic implementation process and systemic change advancement enable both innovation and execution by keeping most activities loosely constructed, but having a few structure points based on the standardized process alternatives and implementation targets.

Thus, coevolution takes place in several forms and levels. A challenge as the basis for change stems from coevolutionary settings between the organization and its competitors and customers; the organization aims at both better adapting to the external environment as well as reshaping it. The management structure fosters coevolution between the internal global and local organizational entities and also enables local coevolution with customers and suppliers. The dynamic process allows and even assumes unexpected changes for both internal and external reasons in the course of the implementation and thus supports coevolution of the changing

organization. According to the systemic change advancement, the solutions are developed through coevolution taking into account both the local needs and global standards, effects and synergies. Analogous with the benefits of the Competing on the Edge strategy, the coevolutionary change can be assumed to feature an advantageous change implementation approach that incorporates both efficiency through economies of scale and synergy benefits as well as flexibility, individual success and innovation as illustrated in Figure 20.

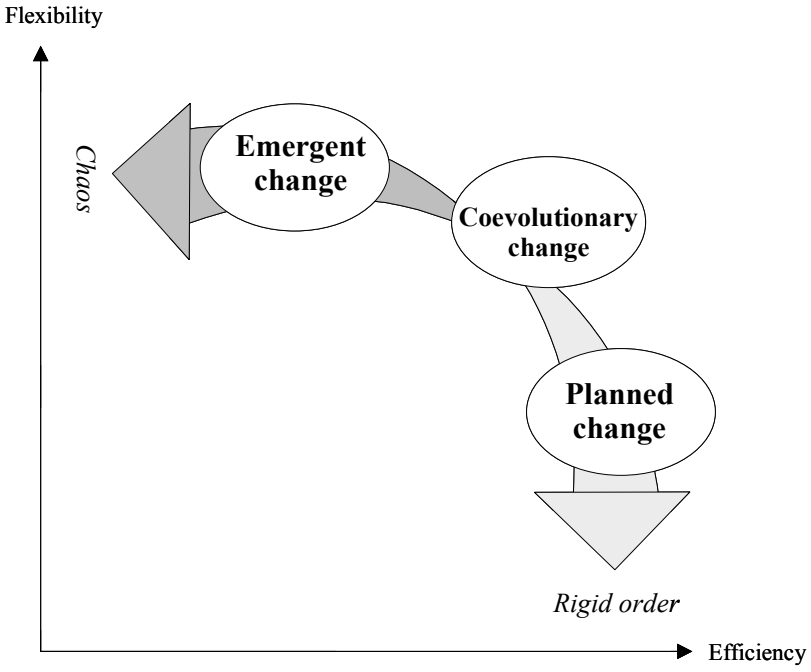


Figure 20. Coevolutionary change as a balance between chaos and order.

To summarize the coevolutionary implementation approach, Figure 21 attempts to integrate the analysed implementation elements into an overall representation. According to the coevolutionary approach, implementation starts with defining guidelines of the solutions for meeting the business challenge at hand. Rather than starting the solution design from scratch, existing ideas are collected and on-going development efforts are exploited. The guidelines are developed to practical solutions in pilots that represent the various business cases as well as possible. The experiences from the pilots are gathered and used for conceptualizing and standardizing generic solutions in a sufficiently detailed level for further implementation. Or, in case the pilots are unsuccessful, the guidelines are redefined based on the experiences and new pilots are carried out. So, if necessary, the process may iterate as long as feasible solutions can be developed for further implementation. As Hamel and Prahalad (1993) comment,

competitiveness is not only about gathering experiences, but also extracting knowledge from them.

Once the generic, standard solutions are defined, they can be implemented to reach the desired coverage of the new solutions. The central management is responsible for co-ordinating the initiation of new local implementations according to the readiness of the local units. As the solutions are generic without specifying all the details, and the context of each implementation is slightly different, local implementations may still result in new learning about the solutions and their implementation. Thus, even the solutions once standardized may be improved and complemented and the plans revised during the implementation. As well, events outside the change effort may cause need for modifications in the solutions or implementation plans. Thus, again iteration between standardization and generating new knowledge by applying the solutions in practice is to be supported. The program management ensures the leverage of synergy benefits between the implementations: experiences and learnings are shared and disseminated throughout the organization. The local implementations then provide the knowledge on the practical implications of the changes and thus contribute to both the implementation plans as well as the creation of the standard solutions.

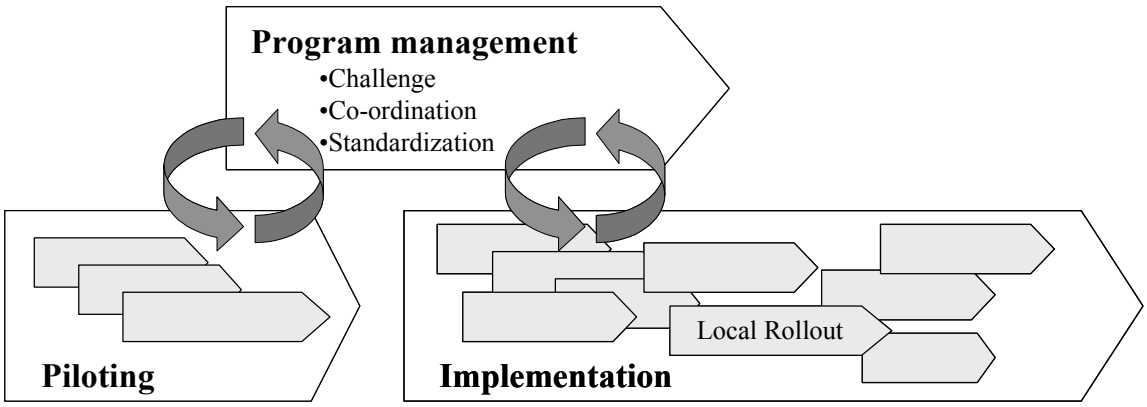


Figure 21. Coevolutionary approach for implementation.

Consistent with Kimberly's and Quinn's (1984) view of management, the coevolutionary change approach is about understanding the tension between the two apparently contradictory ideas that are both conceived operative. Thus, reflecting back to the change process typology of Van de Ven and Poole (1995) presented in chapter 3.3, the coevolutionary approach reminds of the dialectic process: change as a synthesis of conflicting thesis and antithesis in a pluralistic organization (see also McLean et al. 1982). More specifically, the coevolutionary approach can

be considered a synthesis from long-term vision and current problems, central control and local needs, planning and reacting, standardized holistic solutions and diverse individual solutions.

8. CONCLUSIONS AND DISCUSSION

This chapter concludes the main findings of the study. The theoretical contribution and practical utility of the study are assessed and the quality of the research is evaluated against the criteria set based on the selected research methodology. Finally, the implications of the study are discussed and issues for further research are proposed.

8.1 Conclusions

This study was motivated by ambiguity in the existing theories of organizational change. Many change efforts aim at creating a flexible and adaptive organization (Kanter, 1992; see also Eccles and Nohria, 1992), but the means offered by most theories for implementing such change seem to be far from responsive and sensitive to unexpected events. Admittedly, critics towards the simplistic and deterministic view of change have been expressed and alternative approaches have been proposed, but they have been somewhat tentative and restricted by the boundaries between the various disciplines of organizational change, such as OD, BPR or organizational learning and thus leave a lot of room for further research. This study aimed at gaining deep and comprehensive understanding of organizational change implementation by integrating the contribution of the various disciplines and reflecting it with an extensive real-life case.

Thus, the research question of this study was formulated as follows:

- *How to successfully implement organizational change?*

The question was further divided to the following sub-questions:

- *How to carry out implementation according to the existing theories of organizational change?*
- *What are the characteristics of a successful approach for implementing organizational change?*

The answer for the first sub-question was grounded on the various theories of organizational change. The division to planned and emergent approaches was proposed in the existing body of knowledge, but especially the concept of emergent change was not fully established. The validity of the two distinctive implementation approaches was confirmed in this research by reflecting them with the main theoretical disciplines contributing to organizational change implementation. How the theories proposed to implement change conformed relatively closely with either planned or emergent approach. Further findings related to the existing theories were

the four elements of organizational change implementation: initiation, management structure and process of implementation and change advancement. These were the main aspects of implementation that the theories dealt with and also differentiated the planned and emergent approaches to change. The answer for the first sub-question thus consists of two dimensions: 1) the two alternative implementation approaches, planned and emergent and 2) initiation, management structure, process of implementation and the change advancement as the elements of implementation. The *planned* approach is characterized by initiation based on a designed *vision*, *centralized* management structure, *linear and sequential* process and *holistic* change advancement. In contrast, initiation based on an *observed problem or opportunity*, *local* management structure, *continuous* process and *incremental* change advancement feature the *emergent* approach.

The second sub-question was answered using the four elements of implementation as the basis for the case study. The data provided evidence of an implementation approach that was neither planned nor emergent and reflecting the evidence with the existing implementation approaches formed the grounding for a new implementation approach labelled as coevolutionary change implementation. The coevolutionary implementation approach was as well characterized based on the elaborated four elements of implementation. A rational comparison between the new and the existing approaches showed how the coevolutionary change shared some characteristics of both the planned and emergent approaches and combined their strengths to some level. Thus, the *coevolutionary* approach can be concluded as a successful implementation approach, characterized by: 1) initiation based on a *challenge* 2) *co-ordinated, but decentralized* management structure, 3) *dynamic* implementation process and 4) *systemic* change advancement. Finally, the main research question gets an answer based on the presented findings related to the sub-questions.

8.2 Contribution of the Research

The contribution of management research consists of its *theoretical* contribution and practical utility (e.g. Easterby-Smith et al. 1991). The novelty of this study is the new, coevolutionary approach for organizational change implementation. Secondly, the scattered and manifold theory of organizational change implementation is elaborated into four constructs representing the essential elements of implementation. The third theoretical contribution involves the conceptualization of the two implementation approaches, which are presented in the existing theory, but not fully established and linked to the various theoretical disciplines contributing to

change implementation. The study summarizes the extant understanding of change implementation across different disciplines that have been addressing the issues of implementation separately, yet providing very similar models and approaches. Additionally, the study links both the extant and the new approach with complexity theory.

The new implementation approach contributes to the theory of organizational change, where much research has focused on understanding critical factors of successful change, such as leadership, participation, perceived need for change, motivation, planning and progress control (e.g. Salminen, 2000; Kotter, 1996; Beer and Walton, 1987). This study did not concentrate on contributing to the vast body of knowledge on the success factors, but rather on how to ensure or achieve the presence of these factors in implementation. When studying how the existing theories see change implementation, the focus in this study has been on the dominant views within each discipline. Yet, the critics and calls for improvements presented by numerous authors (e.g. Buchanan and Boddy, 1992; Dunphy and Griffiths, 1998; Jarrar and Aspinwall, 1999a) have not been ignored, but used as a foundation for developing the new implementation approach. In addition to the critics, alternative implementation approaches suggested by Dawson (1994), Beer et al. (1990a) and Quinn (1980) were included in the analysis. They broadened the view of successful change management and thus were of extreme value in this study. Yet, these approaches provide alternatives within a specific theoretical discipline, Dawson (1994) and Beer et al. (1990a) proposing an alternative for OD approach and Quinn (1980) for strategy making and OT and thus leave many issues open for further research. The contribution of the coevolutionary approach thus lies on involving the views across the disciplines: elaborating the common pattern of the four elements of implementation and comparing the characteristics of the different theories based on the elements.

The practical orientation in the case study also counts as methodological contribution in this research. Participant observation as a method for studying organizational change is commonly used, but not often in such a profound way as in this research. As Pettigrew (1987) mentions, there are remarkably few studies of organizational change that actually allow the change process to reveal itself in substantially temporal or contextual manner. My role differed from the typical role of an external researcher or a consultant-researcher. I was a full-time member of the change program organization and in various roles in it. I was not only observing or instructing the change, but I was actually making it. Consequently, I was involved not only in formal occasions of planning and managing the implementation, but also in the grass-root work in the local implementation. This provided a unique insight in the case and eliminated the common problem

of the difference between how people think about change and how they implement it in practice, noted by Orlikowski and Hofman (1997). In a research carried out with a more distant role of the researcher, organizational change may seem more systematic and rational than it is, because collecting data via a questionnaire, interview, document or observation of an organized meeting often requires higher level of conceptualization both from the respondent and the researcher already when gathering the evidence.

Admittedly, the intimate proximity with the case also has its drawbacks: the risk of unjustified subjectivity. The means for eliminating such subjectivity in this research relate to the research design. Although I was working in the case program during the data collection phase and thus doing my best for the program success, I did not have any hypothesis or predefined patterns for explaining the success. Like any researcher, I naturally had some preunderstanding of the phenomenon that directed my research, but I was not purposefully looking for specific evidence or testing specific predefined patterns within the case program. Quite the contrary, even the research constructs started to formalize only at the end of the case program and the final results were an outcome of linking the data documented during the program with the research constructs. The insight gained through participation in the case was mainly used for finding the relevant pieces of the documented data and understanding their meaning rather than for directly answering the research questions. Thus, despite of the intimate connection with the research object, the risk for researcher bias was minimized with the research design and the applied methodological triangulation that will be further addressed in chapter 8.3.

The *practical utility* of this research consists of the new implementation approach and the synthesis of the existing theory. The basis for the case program implementation was the microcosm approach (Hoover et al. 1996) that was further complemented with an overall program viewpoint introduced few years later by Hoover et al. (2001). This study continues the work with a more theoretical viewpoint and a deeper, more systematic and extensive case study. Based on previous research, change practitioners are probably already familiar with the most important factors critical for successful change. However, being aware of the importance of leadership, participation and control does not yet guarantee achieving the presence of these factors in change implementation. This research gives change leaders practical understanding on how to actually implement change, bearing in mind the importance of the critical factors. Although the coevolutionary implementation approach is generic, it involves elements directly applicable in practice. The case study as well provides concrete examples of how coevolutionary implementation may be carried out in real-life.

The coevolutionary approach incorporates flexibility as well as efficiency, which are both seen desirable for change implementation in the context of this study. In that sense the new approach is considered superior to the existing planned and emergent approaches when implementing large-scale change in a multi-unit organization. However, although presented as three distinctive approaches, the planned, coevolutionary and emergent approaches also represent different positions in a continuum between the extremes. Thus, although the coevolutionary approach combines the strengths of both planned and emergent approaches, a manager may in practice apply the approach in a way that is slightly closer to the planned than the emergent extreme. Depending on the characteristics and context of a specific change effort, either flexibility or economies of scale may be more desirable, although both important. Thus, in addition to the value of the coevolutionary approach itself, understanding the existing approaches and their characteristics is as well beneficial in practice.

The existing approaches together with the new one provide organizational change practitioners three generic models of implementation. Presenting the alternative approaches using the common elements of implementation enables comparison and conscious consideration of an implementation approach for carrying out specific changes. The evaluation of each alternative provides guidelines for deciding on an applicable approach based on the desired features in different types of organizational changes. Linking the approaches with the existing and well-known disciplines of organizational change also provides a point of reference for the practitioners who are specialized for example in OD, BPR or OT.

8.3 Evaluation of the Research

The quality criteria and the means for meeting them in this research were defined in chapter 2.4 based on the generic criteria for good research design and the specific criteria related to the applied research approach, inductive theory building from a qualitative case study. The generic criteria relate to the validity and reliability of the research.

Construct validity requires establishing correct operational measures for the concepts to be studied (Kidder and Judd, 1986). In this study, the main concerns are how the concepts of successful organizational change and implementation approach have been operationalized. Based on the body of knowledge, the success of change was defined in this study as the positive influence the change has in the supply chain processes. The supply chain performance indicators used were as well based on the theory, selecting the most relevant ones for the analysis. Then, implementation approach was operationalized using four research constructs to guide the data

analysis. The challenge in defining the constructs was to form a uniform and comprehensive view of the phenomenon, as the essential concepts have no commonly accepted nor standardized definitions or even terminology. Thus, a relatively extensive review of existing theory on organizational change implementation, involving various theoretical disciplines, was required for developing the research constructs. As the empirical data was carefully linked to the constructs, a chain of evidence between the research questions, data and conclusions was established. The rigorous and practically oriented case description highlights the evidence in the data indicating each construct and the related characteristics. Moreover, multiple data sources and collection methods were used: participant observation, large number of documents and presentation material concerning both the program as a whole and the individual implementation. As well, participant observation in different roles in the program was carried out, which provided the deep understanding of the phenomenon. Most data is qualitative in nature, but also few quantitative indicators were used. As a further validity check, respondent review of the case description was done by 3 members of the program organization to eliminate unjustified subjectivity of the interpretations made by the researcher.

Construct validity could have been further increased using yet additional data sources and collection methods, such as interviews. Interviews could have further strengthened the incorporation of multiple realities in the study. On the other hand, as the evidence provided by the rich data available sufficiently demonstrates the conclusions, additional data could also have disrupted the focus of the research. As well, the chain of evidence could have been made even more transparent if all the indicators of the constructs had been linked with the specific data sources including the evidence. The reason for not doing so was the trade-off with the readability of the case description.

Internal validity deals with the causal relationships of a study (Kidder and Judd, 1986) that rarely have a major role in a case study (Yin, 1994). However, the correctness of the inference from the evidence is relevant in this study, although its main objective is on understanding with little focus on causalities. However, the study explains successful change with the coevolutionary implementation approach and thus the underlying question of its internal validity goes like: is the coevolutionary approach a means for successful change? In this kind of real-life case study, it is naturally impossible to eliminate all other factors that influence the performance of the organization, but using multiple performance indicators and a rigorous description of the applied implementation approach, the case does provide profound evidence of the positive impacts of the change. Thus, the inductively formed conclusion is that the coevolutionary

approach explains success of change. The data was analysed according to the grounded theory approach, which ensures linking the data tightly with the theory. Also theory conflicting with the case evidence was widely presented and the evaluations of the extant approaches to change implementation grounded the reasoning for the elaborated new approach.

External validity refers to the domain to which the research findings can be generalized (Kidder and Judd, 1986). Involving only a single change program in the research can be considered a weakness of this study, especially from a positivist point of view. Including multiple change programs could inevitably have enhanced the external validity of this research, but considering the practical constraints, it could also have meant a trade-off in the depth of understanding the phenomenon and thus risked the novelty of the results, which was prioritized in this study. Based on the single change program, it can be presumed that the approach is valid also in other cases, although there is no empirical evidence.

Within the single change program, the external validity was approached by the embedded case design of the study. Having a large number of embedded cases within the program ensured replication across them. Generalizability in the program level is then based on the extensive comparison with literature as well as a rigorous case description for enabling the reader himself to relate to the issues and judge the applicability of the results. According to the title and scoping of the research, the results are analytically generalizable to any large-scale organizational change involving multiple units, regardless of features like the line of business. However, as the feasibility of the coevolutionary implementation approach is based on the characteristics of economies of scale and flexibility, organizations that do not value these features in change implementation, are not likely to gain benefits from the approach, which possesses a further restriction to the generalizability of the results. Thus, the underlying assumption of the paradigm shift from the old organizational success factors like size, role clarity, specialization and control to the new success factors such as speed, flexibility, integration and innovation (Ashkenas et al. 1995) affects also the external validity of this research.

The *reliability* of this study is ensured by providing relatively detailed description of the data used as well as having an electrical database including all the research data for later reference and checking. Having documented case protocols could also have contributed to the reliability, but as the program documentation was so extensive, it was not considered necessary or worthwhile.

In addition to the quality criteria already discussed, the quality criteria specific to qualitative research include *close proximity to the phenomenon under study and flexible research structure* (Bryman, 1989; Stake, 1995). Concerning the proximity to the studied phenomenon, I can argue that I could not have been closer to the change implementation as I was. The only instance that remained somewhat distant for me in terms of first-hand experience was the steering group, so I had to rely more on documented data concerning the discussions and decisions that took place among the group. Flexibility of the research structure was ensured by not having any hypotheses or exact patterns to be verified by the data. The research constructs for focusing data analysis were also formulated only after the field research and thus the data available was not restricted by them, but would have enabled modifications in the research structure.

Specific requirements for a case study count for the *validity of empirical data, understanding dynamics of single settings, analytical generalization and the novelty of outcomes* (Yin, 1994; Stake, 1994 and 1995; Eisenhardt, 1989a). As the topics have been addressed either earlier in this chapter or in chapter 8.2 they will not be repeated here. Overall, it is thus argued that this dissertation satisfactorily fulfils the quality criteria set for it.

8.4 Discussion and Issues for Further Research

Grounded by the rational evaluation of the three implementation approaches, in the context of this study the coevolutionary approach is argued to be an enhancement of the existing planned and emergent ones. However, as the applied research design does not enable empirical comparison between the approaches, the argument can only be a proposition for further testing. Fully establishing the advantages of the coevolutionary approach definitely calls for *more extensive evidence* and requires further research.

It can also be assumed that none of the approaches is absolutely superior, but their value and applicability depends on various *conditions*. To reveal these dependencies is likely to require considering the alternative approaches as positions in a continuum between the extremes of planned and emergent approaches, rather than as distinctive models. Weingart (1992) argues how ad hoc emergent processes, which she calls "inprocess" planning, would play an important role in case of a difficult and unfamiliar task. Consistently, Dixon et al. (1994) claim that decentralized organization best supports generation of innovative ideas, whereas centralized organization is best able to implement the innovations and thus the leadership roles and project structure might need to vary significantly in the two phases. Adams and Barndt (1983) argue how the settings and organization of a project tend to be less mechanistic in the early and late

phases of a project than in the middle where the degree of uncertainty decreases. The case program of this research also provides some indication of this type of difference in the settings as change implementation progresses. Therefore, although the underlying theme in this research is how idea generation and implementation can not be divided as distinct phases, there are valid reasons to believe that the kind of change that involves more *unfamiliar* tasks and thus requires generating new ideas more, would especially benefit from an approach closer to the emergent extreme. On the other hand, a change that is more familiar, could be implemented using an approach that more closely resembles the planned one.

As a basis for other potential conditions, DiBella (1996) presents a theoretical proposition that the more there are cultural boundaries that span a change process, the more the change outcome will deviate from the plans or expectations. Weber (1947) and Kilmann (1985) agree that the more homogenous an organization is, the better applicable a centralized approach for change is. Concerning IT change, Macredie and Sandom (1999) found correlation between the level of user dissatisfaction and the emergence of any local improvisations regardless of the organization type. Thus, it could be assumed that a more planned-like approach would be more suitable in homogenous organization where it is not too difficult to understand the operations and needs of different organizational units. Vice versa, organizations with a lot of *diversity* might be especially unsuitable for the planned-like approach. Therefore, although the coevolutionary approach seems rather universal, further research on the conditions affecting the suitability of all the approaches would provide valuable understanding on implementation in different contexts. This kind of research would naturally need to include different organizational change efforts in different types of organizations and potentially also in different types of environments, for example in stable and high velocity industries.

Research including a number of different change efforts could also provide further insight to the central elements of change implementation that in this research were elaborated from the body of knowledge and the empirical case program. The four elements used in this study (initiation, management structure, process and change advancement) make up a first step in conceptualizing change implementation, but the list may well not be inclusive. Further studies of diverse efforts could reveal *additional important elements* for characterizing and describing implementation.

Finally, deeper research focusing on the *individual implementation elements* would be valuable. Although this research was practically oriented, the provided understanding on the real-life application of the coevolutionary change approach is limited. For example, further descriptions

of different challenges motivating change could support practitioners; studying various ways to make up a co-ordinated, but decentralized management structure for implementing change could broaden the view of the coevolutionary approach; different practical tools and models could be developed to support managing a dynamic implementation process or systemic change advancement. To conclude, further research is needed for more extensive evidence and deeper understanding on the topic by answering the following research questions:

- What and how extensive evidence is there about the coevolutionary approach for organizational change and its benefits?
- Which factors favour or hinder the applicability and success of the coevolutionary approach for implementing organizational change?
- In addition to initiation, management structure, process and change advancement, are there other essential elements of organizational change implementation?
- What kind of practical applications and methods are there for implementing change according to the coevolutionary approach: 1) change initiation based on a challenge, 2) co-ordinated, but decentralized management structure, 3) dynamic process and 4) systemic change advancement?

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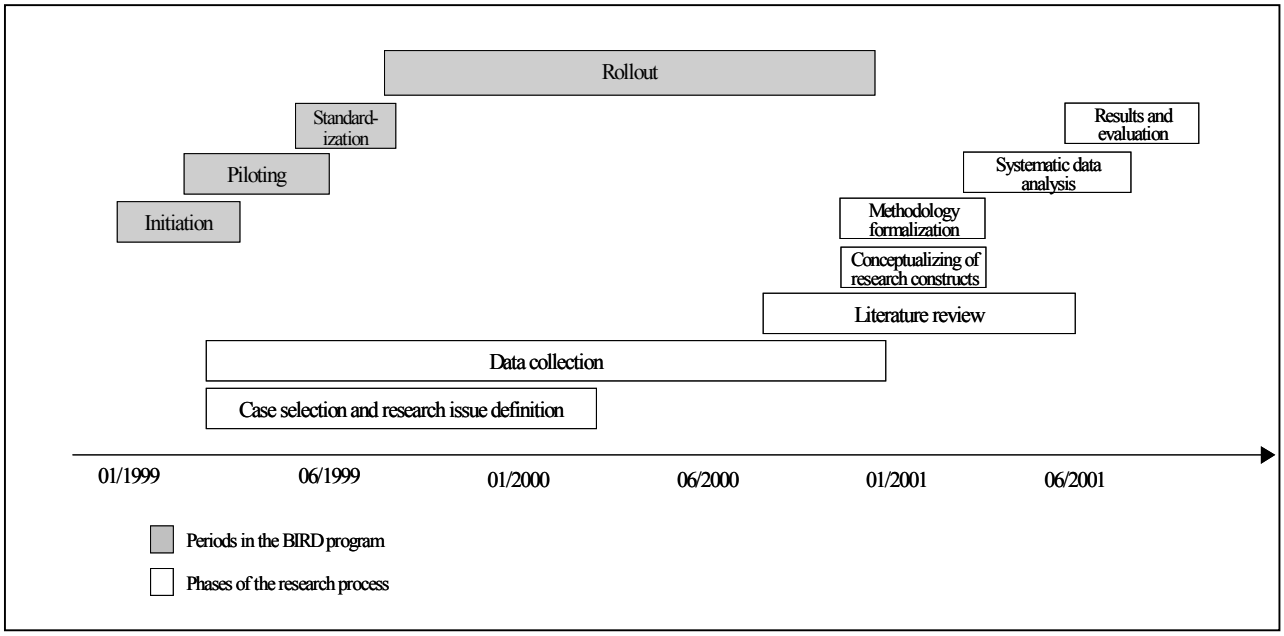
APPENDIX A: RESEARCH PROCESS IN RELATION TO CASE PROGRAM PROGRESS



APPENDIX B: BIRD PROGRAM SUMMARY

This appendix presents BIRD account summary prepared in the end of the program, excluding irrelevant and confidential information.

BIRD ACCOUNT SUMMARY
15th November, 2000

	Products included				Service scope	Kick-off	Closing	Delivery mode*
	BTS	Radio	Global 3rd party products	Local 3rd party products		original		
Case A	x	x	x	x	Turnkey	1.2.99	23.6.99	DD
Case B	x	x	x	x	Telecom deployment	1.2.99	23.6.99	CB -> RDC
Case C	x	-	-	-	Telecom deployment	16.3.00	23.6.00	DD
Case D	x	-	x	-	Telecom deployment	1/99	4/00	RDC
Case E	x	x	x	x	Turnkey	16.8.99	1.2.00	CB -> RDC
Case F	x	x	x	x	Turnkey	11.09.99	1.4.00	CB
Case G	x	x	x	x	Telecom deployment	9/99	3/00	RDC
Case H	x	x	x	x	Turnkey / telecom depl.	14.9.99	1.3.00	CB -> RDC
Case I	x	x	x	x	Telecom deployment	10/99	4/00	RDC
Case J	x	-	x	-	Box	5.1.00	3.3.00	DD
Case K	x	-	x	-	Telecom deployment	13.1.00	11.4.00	DD
Case L	x	-	x	x	Box	14.1.00	10.5.00	DD
Case M	x	x	x	x	Telecom deployment	18.1.00	28.6.00	DD
Case N	x	-	-	-	Box	24.1.00	9.6.00	DD
Case O	x	-	x	x	Telecom deployment	1.2.00	7.6.00	DD
Case P	x	x	x	x	Telecom deployment	1.3.00	08/00	RDC
Case Q	x	-	x	x	Box	13.3.00	w50	DD
Case R	x	-	x	-	Box	15.3.00	13.6.00	DD
Case S	x	-	x	x	Telecom deployment	1.4.00	11/00	RDC
Case T	x	-	x	-	Telecom deployment	4.4.00	18.5.00	DD
Case U	x	-	x	-	Telecom deployment	17.4.00	12/00	RDC
Case V	x	x	x	x	Telecom deployment	19.6.00	12/00	DD
Case W	x	-	-	-	Box	8.7.00	8.9.00	DD
Case X	x	-	-	-	Box	8.7.00	15.12.00	DD

* DD=Direct Delivery
CB=Country Buffer
RDC=Regiobnal Distribution Centre

APPENDIX C: CONTENT OF BIRD ACCOUNT ANALYSIS

A complete account analysis document consists of the questions presented in this appendix and the answers to them.

PURPOSE

The purpose of the document is to collect needed data to define target BIRD concept for the account and to assist in prioritization of accounts in the program level.

GENERAL BUSINESS

Customer Profile

When and where did the operator first launch?

What is the order of the operator in terms of when it was established in the country (e.g. 3rd operator)?

Is the customer local or part of a global company?

Does the company have strong links to another telecom company?

Customer's decision making process, organization and leadtime, e.g. who are real decision makers within the customer?

What is the relationship with the customer (e.g. partnership, arms-lengths)?

What competitors are supplying what equipment to the customer?

What are the key buying factors for the customer, i.e. is it speed, cost, quality, expandability, …?

How much has been sold to the account last year? What is the estimate for this year?

What is the rollout plan (including number of sites/month)?

How is the customer project organized?

What are the main issues/problems currently, e.g. does customer have any requirements for their supply chain?

Contract

Has the contract been reviewed as part of the BIRD contractual review and if so what where the conclusions?

Are there penalty clauses for late delivery of equipment or sites on air?

Does the contract include any logistics clauses and if so what are the main points?

When will the contract expire?

Are there any contract revision/re-negotiations planned prior to the contract expiration?

Is the case in local sales mode or direct export mode?

Products and Lead Times

What BSS products are sold to the account?

How many different configurations are sold?

Are there a number of configurations agreed up front with the customer or does the customer create new configurations ongoing?

Is it the customer or NET that defines the configurations?

Are products provided as modules/units or as configurations or as complete sites?

Does customer require configuration specific testing?

What third party products are bought locally versus from the product line?

How aligned are local third party products with the global?

What are the plans for moving to global third party products?

In what factories are the different products produced?

What are the factory lead times?

What are the required lead times per product between customer order and delivery?

CS PROCESS

Transmission plan

What percentage of links are leased lines versus transmission radios?

How often does the transmission plan change?

Site acquisition

How long does site acquisition normally take?

Implementation and integration

What is the scope of NETs services (e.g. telecom installation, turnkey)?

Are the same sub-contractor used for BTS and transmission radio installation?

What is the relationship with the sub-contractors, i.e. partnership or not?

What different types of sites are there ?

In what percentage of cases are crane lifts required?

Is any pre-fabrication done at the sub-contractor prior to delivery to site?

Are sites constructed as soon as they become available or according to a cluster principle or as late as possible given resource constraints?

How many sites can be constructed per week and what drives this constraint?

What is the throughput time between start of constructions and site on air?

How are sites integrated?

How is network elemet integration done (i.e. remote integration)?

LOGISTICS PROCESSES

Demand Planning

Is the new demand planning process in place?

To what extent is the customer involved in demand planning?

How accurate are demand plans?

Ordering

How long before the start of the telecom installation is the exact equipment to be installed known and how often does this change?

Is there a possibility to increase the visibility of what equipment is needed either through process changes or closer co-operation with the customer?

What is the order triggering point for telecom equipment?

What are the product levels in orders in customer-account team and account team-product line interfaces?

Delivering

Where are goods delivered for site works (e.g. site, drop-off point, sub-contractors facilities)?

Are all products delivered jointly to the site?

Transportation & Forwarding

What are the transportation lead times from factory to country?

What are the in-country transportation lead times?

What are the delivery frequencies between factory and country and inside the country?

Which transportation companies are used in the whole chain from factory to site?

Are there any special arrangements in customs clearance?

How long does it normally take to make the import forwarding & customs clearance?

Inventory

What are the current inventories in-transit, in stock and as work in progress at sites by product?

Why are inventories kept?

Are inventories held as configurations or units/kits?

What are the inventory replenishment principles?

Who is running the warehouse?

Invoicing

When are goods invoiced to the customer?

What IT system is used for invoicing?

SYSTEMS AND METRICS

IT systems

Is the standard sales and logistics IT system in use and if not when will it be implemented?

Is product configurator system in use?

What system is used for milestone follow-up in the CS process?

What system is used for CS order specification and ordering?

What system is used for work time recording?

Metrics & Reporting

What metrics have been put in place and are regularly followed-up?

How well are the current metrics aligned with NET wide metrics?

CONCLUSIONS

Evaluate the business impacts:

- Expected savings (in inventory value)?
- How much sales is covered?

Evaluate the complexity of BIRD implementation:

- How long would BIRD roll-out take ?
- How many resources is needed ?

What is the target BIRD concept?

What are the risks?

When can BIRD roll-out start?

APPENDIX D: CONTENT OF BIRD PROJECT PLAN

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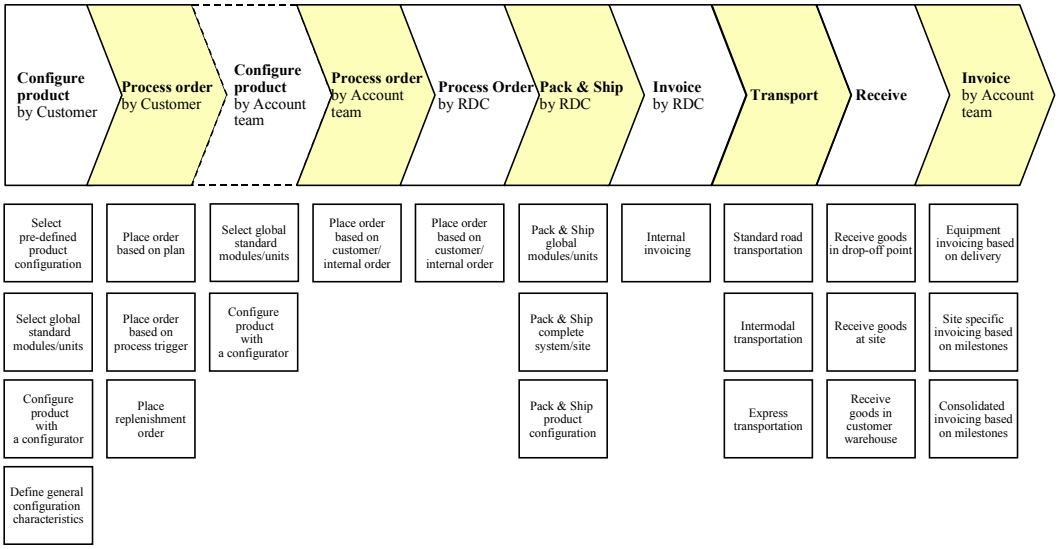
APPENDIX E: TEMPLATE FOR PROCESS DESCIPTION

The RDC process chart below represents the process description templates that additionally consisted of the Direct delivery and the Country buffer processes. The template was used by selecting the appropriate process modules according to the local process defined during the local implementation.

RDC Process



APPENDIX F: CONTENT OF BIRD PROJECT FINAL REPORT

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APPENDIX G: TEMPLATE FOR BIRD PROJECT SUMMARY

"ACCOUNT NAME"

PRODUCTS INCLUDED IN BIRD

Base Station X	☐	Radio X	☐	Global 3rd party products	☐
Base Station Y	☐	Radio Y	☐	Local 3rd party products	☐
Base Station Z	☐	Radio Z	☐		

ACTIVITIES IMPLEMENTED

Mark status according to the following categories:
0: Implemented before BIRD 1: Implemented completely during BIRD
2: Implemented partly during BIRD 3: Not implemented N/A: Not applicable

Customer proposal	Cat.	Comments	Verification
• Contractual changes			
• Operative changes			
Demand planning			
• Customer involvement			
• Internal process (calendar, items, account team involvement)			
• New tool			
Site process integration			
• Logistics and project integration			
• Order triggering			
• Milestone follow-up			
Deliver process			
• Electronic order handling			
• Warehouse closed			
• Direct deliveries			
• RDC deliveries			
• Country buffer			
• Standard lead time			
• Complete (site) delivery			
• Express pipe			
• Traceability			
Logistics service partner management			
• Transportation			
• Drop-off points			
• Country buffer			
Metrics			
• Delivery accuracy to confirmed			
• Delivery accuracy to request			
• Lead time			
• Planning accuracy			
• IRD 3 months			
• IRD 6 months			
• Inventory values			
General			
• Processes approved			
• Hand-over to local organization			

PRODUCT LEAD TIMES

	Before BIRD roll-out			At the end of BIRD roll-out		
	BTS	**Radios**	**3rd party**	**BTS**	**Radios**	**3rd party**
Customer lead time*						
Internal lead time**						

* Customer lead time means the time between customer call-off and arrival at customer's delivery address (site/drop-off point/ customer warehouse).
** Internal lead time means the time between creating purchase order to plant and receiving goods to the delivery address (country warehouse/country buffer).

BIRD ROLLOUT SCHEDULE & RESOURCES

	Kick-off	Closing
BIRD project dates		

Role	Name	Time (%)
BIRD rollout manager		
BIRD logistics expert		
BIRD CS expert		
Logistics manager		
Project manager		
Account manager		
Logistics co-ordinator		
CS project team member		
Other		

MAIN CHALLENGES:

OPEN ISSUES:

APPENDIX H: EXAMPLES OF CHANGE IMPLEMENTATION PROCESSES

BIRD model process phase	Time	Event or activity	Generic phase (Bullock and Batten, 1985)
Case G			
Rollout preparation	09/1999	• Account analysis made • BIRD preparation meeting involving local representatives (logistics, CS, account management), prospective rollout manager and logistics expert and program management. Decisions: target process, rollout team, schedule including kick-off meeting date and first actions (internal and customer communications, product portfolio definition)	Exploration Exploration, Planning
	10/1999	• BIRD kick-off meeting involving the rollout team (representatives from local logistics, CS and account management, BIRD rollout manager and logistics expert) and few other local stakeholders, product line and RDC representatives, BIRD program management). Topics: BIRD targets, content of BIRD change, responsibilities and first issues identified.	Planning
Implementation	11/1999	• Local BIRD bulletin no. 1 issued. Topics: general and case specific BIRD targets, content of the change, benefits and schedule • Kick-off for local CS organization • Collection of information and experiences from local stakeholders in workshops • Preparation for RDC delivery readiness • Change of start date of RDC deliveries due to delay in RDC project • Detailed site process definition. Workshop on demand planning process • RDC process documented in detail and operating instructions made.	Exploration Planning Planning Planning Planning Planning Planning
	12/1999	• RDC product portfolio definition and volume estimations • Planning the launch of a new type of radio • Express pipe testing	Planning Planning Action
	01/2000	• Demand planning instructions made • Cost control issues added to the process definition • IT system testing with RDC • Discussion of BIRD principles for customer in a project meeting • RDC product portfolio completed • Financial impact of the changes calculated • First order to RDC sent	Planning Planning Action Planning Action Planning Action
Follow-up	02/2000	• RDC deliveries piloted. Process carefully reviewed and obstacles solved • Official development project started with customer to integrate their processes with Nokia's • Warehouse ramp-down carried out in collaboration with the product line	Action Planning Action
	03/2000	• Reporting of new performance indicators started • Full-scale implementation of the new processes	Action Action, Integration
	04/2000	• New share of responsibilities agreed with customer • Processes redefined according to the new share of responsibilities • Piloting of the new processes with customer	Planning Planning Action
	05/2000	• Demand planning workshops with customer • Process definition with customer completed • Warehouse clean-up completed • BIRD rollout finished, development project with customer to continue.	Planning Planning Action Integration
	06/2000	• Development project with customer completed • BIRD rollout final report made	Integration Integration

Case U			
Rollout preparation	03/2000	• Account analysis made	Exploration
	04/2000	• BIRD kick-off meeting involving the rollout team (representatives from local logistics, CS and account management, prospective logistics expert and program management). Targets, target process (RDC), actions needed and responsibilities agreed • Discussions on the target process with the customer, separately with their regions • Definition of the detailed process, especially the integration of deliveries with the site process • Recognition and solving IT system related issues concerning the new process	Exploration, Planning Planning Planning Planning
	05/2000	• Training on the target process for people responsible for operating the process • Feedback from customer negotiations: regional stakeholders positive, headquarters not. Alternative customer proposals agreed. • Time schedule for starting with the new process agreed: pilot orders to RDC in 06/2000 from one area, other areas and official start with the customer in beginning of 07/2000	Planning Action, Planning Planning
	06/2000	• Issues related to different product tracking in RDC. Requirements stated in customer contract, solutions looked for with RDC, product lines and IM • Schedule to start RDC process full-scale modified: start postponed for 2 weeks	Planning Planning
	07/2000	• Detailed RDC process documented with guidelines for IT system use • IT system test with RDC and product line done including testing the solution for product tracking • Customer negotiations of the BIRD target process on-going	Planning Planning Action
	08/2000	• Problems encountered in the IT system test being solved	Action
Implementation	09/2000	• First pilot order to RDC made • Temporary process defined and documented including the interim solution on product tracking • Problems in starting RDC process full-scale due to worldwide component shortages	Action Planning Action
	10/2000	• Changes in packing made in RDC due to problems encountered as RDC packing differed from the existing way • Changes in providing product test results from RDC made	Integration Integration
	11/2000	• RDC process started in full-scale, first order	Action
Follow-up	12/2000	• Country warehouse ramp-down started	Action
	02/2001	• Project closed and closure meeting held: problems with the process gone through and actions agreed, learnings discussed. Biggest problems related to the component shortages.	Integration