

*Lena Wilhelmson and Marianne Döös*

# Sustainability and innovative organisational change

Identifying and dealing with non-synchronised processes  
in a rapidly changing environment

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## **ARBETSLIV I OMVANDLING WORK LIFE IN TRANSITION**

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# Abstract

The meaning and possibilities of the concept of sustainability are in focus in a secondary analysis based on a case study of learning and organisational renewal. The business area studied is new product development within the telecom branch. The studied unit went through thorough and innovative renewal – as new managers were appointed, and its field of activity and ways of organising work were changed. This case study is used for critical reflection on the sustainability concept through highlighting its complexity. Sustainability is related to processes concerning four different aspects of the ongoing business: in products, in organisation structure, in principles related to how work is organised, and for individuals. In a rapidly changing environment sustainability can be understood as the ability to interpret and deal with the complexity, alterations and dynamics – through time and over levels – of non-synchronised processes. Discussing sustainability requires both an awareness of which aspects to include and consider, and a time perspective long enough to experience the different phases of ups and downs.

**Keywords:** Sustainability, intensity, renewed, change, innovation, organisational learning, complexity, product development, Information Technology, telecom, datacom, organisation, organisation development, non-synchronised processes.

# Sammanfattning

Arbetsintensitet har framträtt som den främsta riskfrågan i dagens och morgondagens arbetsliv. Föreliggande rapport är ett bidrag i ett pågående samhällssamtal rörande intensiva respektive uthålliga arbetssystem. Processer är minst lika viktiga som strukturer i en organisation. Det innebär att det fordras lärande och en ständig utveckling av organisationen i ett antal avseenden, att det krävs uthålliga processer för att för att nå hållbarhet. Speciellt gäller detta för verksamheter vars omvärld ständigt förändras på ett svåröversägbart sätt, något som blivit allt vanligare med snabb teknisk utveckling och ökad globalisering.

I föreliggande rapport är innebörden av begreppet uthållighet<sup>1</sup> i fokus genom en sekundäranalys baserad på en fallstudie angående lärande och organisatorisk förnyelse. Den studerade verksamheten är ny produktutveckling inom telekommunikationsområdet. Den studerade enheten gick igenom en omfattande och innovativ förnyelse – nya ledare tillträdde, man förändrade verksamhetsinriktning samt sätt att organisera arbetet på. Fallstudien används här för kritisk reflektion över uthållighetsbegreppet genom att lyfta fram dess komplexitet. Uthållighet relateras till processer som rör fyra olika aspekter av den pågående affärsverksamheten: produkter, organisationsstruktur, principer för hur arbetet organiseras, och individer.

I en snabbt föränderlig omgivning kan uthållighet förstås som förmågan att tolka och handskas med icke-synkroniserade processers komplexitet, svängningar och dynamik. Att diskutera uthållighet kräver både en medvetenhet om vilka aspekter som bör inkluderas och beaktas, och ett tidsperspektiv som är långt nog för att inom de studerade aspekterna erfara faser av såväl upp- som nedgång, med- som motvind.

**Nyckelord:** Uthållighet, hållbarhet, intensitet, förnyelse, förändring, innovation, lärande, komplexitet, produktutveckling, informationsteknik, telekom, datakom, organisation, organisationsutveckling, icke-synkroniserade processer.

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<sup>1</sup> Det engelska begreppet sustainability översätts omväxlande till uthållighet och hållbarhet. Vår tolkning av detta är att hållbarhet mer adresserar det önskade utfallet, medan uthållighet mer avser de processer (periodvis krävande) som är aktuella längs vägen.

# Preface

The coming into existence of this report has its origin in us being invited to participate in a European network of researchers dealing with work organisation and organisational development. This SALTSA network<sup>2</sup> consists of researchers from nine countries and has resulted in a book dealing with working life issues when moving from intensity to sustainability. The book is entitled “Creating sustainable work systems: Emerging perspectives and practices”<sup>3</sup> and this report is an extended version of our chapter (Wilhelmson & Döös, forthcoming) in that book.

Work intensity has emerged as the number one risk issue in today’s working life. We found it interesting and important to take part in the contemporary dialogue on intensive and sustainable work systems. In this report we reflect over the sustainability concept, trying to understand it in the light of a case study from the rapidly changing telecom branch. We present a secondary analysis of a study where we originally focused on issues concerning learning and competence development .

As researchers in a multidisciplinary group – Organisational Development and Learning – at Sweden’s National Institute for Working Life we act in an environment that stimulates this use of a study on pedagogical issues for new purposes. We are challenged and obtain support for such transcending by our colleagues within the group and by the SALTSA network.

Solna, March 2002

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<sup>2</sup> SALTSA is the Swedish acronym for a joint research programme on working life in Europe organised by Sweden’s National Institute for Working Life (Arbetslivsinstitutet) and the three Swedish trade union confederations LO, TCO and SACO.

<sup>3</sup> (Docherty, Forslin, & Shani, forthcoming a). The book provides a source of recent thinking around sustainability and is referred to throughout this report.

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# Introduction

Learning, development and sustainability are all words with positive connotations. In reality all three are also related to – and perhaps even dependent on – pain and difficulties. This inherent conflict is an assumption behind this report where light is shed on the complexity of sustainability through making use of an empirical case. There is a risk connected to how concepts like learning, development and sustainability are understood. Taking experiential learning as an introductory example – since work life learning is our disciplinary field – we can point to the fact that what is learnt is generally assumed to be generated by satisfying processes leading to an intended good outcome. Accordingly the *processes* are easily thought of as being as harmonious and unproblematic as the outcome. Learning, however, requires change and new thinking that expand earlier understanding, and involve leaving old paradigms and entering new ones. These are painful and laborious processes for individuals as well as organisations, and thus by no means easy to struggle through. Problematic duality, i.e. a mix-up between properties belonging to process and outcome, is an underlying assumption in our work that permeates this report.

Sustainability is an interesting but problematic concept. It is easily thought of as a state of being, possible to reach, and – like learning – it is easily seen as entirely positive and good. We look upon sustainability in a more dynamic way:

... only a system that is continuously in a state of “becoming”, can be called “sustainable”. Sustainability cannot be regarded as a static characteristic of a structure or a process because everything in the system is constantly “on the move”. A definition of sustainability must take account of time as a key factor, and should focus on dynamic qualities of the system. (Backström, Eijnatten, & Kira, forthcoming).

On our view, an understanding of sustainability can profit from being thought of as a process. We discuss the concept of sustainability through reflecting it as including periods of comfort, growth and equilibrium, as well as phases hosting pain, fractures and labour. Our aim is not to prescribe how to reach sustainability in working life. It is rather to use a case study for critical reflection on the sustainability concept by highlighting its complexity.

This report is based upon a case study concerning learning in organisational renewal and innovation. The aim was to obtain knowledge of learning processes in a unit of a high-tech company. The unit was changing its organisation to be able to meet with increasing demands on efficiency and continuously changing competence requirements. Using this case for a secondary analysis offers an

opportunity to *reflect upon the issue of sustainability over time, in a rapidly changing environment.*

As a result of the analysis we place sustainability in relation to phases of development over time in four different aspects of the ongoing business; in products, in organisation structure, in principles for how to organise work, and for individuals. Within those aspects phases of ups and downs were tracked down and related to the issue of sustainability.

Moneymaking *products* were let go and transferred to other units, and new products were developed instead. Some became successes while others remained as prototypes.

The *organisation structure*, being a small local design centre within a global company, makes the unit dependent on decisions made at higher levels. The unit is weak from the beginning, growing stronger, it merges and later splits up again.

*Internal organising principles*, grounded in ideological visions, are first developed and then meet with severe difficulties as they collide with a totally different set of principles in the merger. At the split, ideas get spread in all directions and are rooted in new soil.

*Individuals* meet with high demands on knowledge development. Those making use of the development opportunities get a stable ground for new work tasks, those not willing to learn the new technology disappear to other units and continue to work with the traditional AXE technology.

Following this introduction we shall give some indications of our theoretical lenses. There then follows a description of some characteristics of the case and of important organisational events during the period 1995 to 1999. The fluctuations within the four aspects of the ongoing business mentioned above are described next. This description is intertwined with the presentation of more analytical reasoning and some observations. Finally, we discuss the issue of sustainability, over time, in this changeable environment.

# Theoretical setting

The major theoretical setting for this report, in terms of the lenses used for the original data collection and for the secondary analysis, concerns the learning and development of individuals as well as organisational levels. Another important aspect of the theoretical background concerns the concept of sustainability. The two are related in several ways. The aspect that we would like to emphasise here is the contemporary situation, where knowledge management and competence development are seen as crucial to competitiveness and company success on the market. The significance of the ability of an organisation to learn and renew competence is also interesting and problematic, since a common situation today is that there is a conflict between efficient production and the learning possibilities of the organisation and its individuals. Competence development is stressed, but – at the same time – learning conditions frequently deteriorate due to staff reductions and the slimming-down of organisations. However, since competence is recognised as a crucial issue for competition, management struggles continuously with how to organise for competence development. Dixon (2000) adds to our understanding of this issue when she speaks of three major shifts in organisations capable of handling change:

The first is a shift in thinking about who in the organisation has credible and valuable knowledge that the organisation can use to solve its difficult problems.

The second is a shift from thinking of knowledge as an individual phenomenon to thinking of knowledge as embedded within a group or community.

The third is a shift from thinking of knowledge as a stable commodity to thinking of knowledge as dynamic and ever changing. (Dixon, 2000:148-149).

Thus, transformational capacity is needed in order to sustain in a changing environment. Below we present the background of the sustainability concept and its current use within the field of working life and organisational development. There then follows a presentation of the theory of learning through experience, interaction and communication, which has served as our eyeglass when looking at the organisational processes of the studied unit.

## Sustainability – a conceptual background presentation

In this section we will briefly display the sustainability concept as it is being conceptualised by the SALTSA network. The concept is at a fairly early stage of

development. Thus, there is not as yet one ready-made definition to apply. Accordingly, by approaching it from our learning perspective we aim to contribute to an ongoing process. Before proceeding in that direction, however, a presentation is given below of other emerging ways of looking at the concept of sustainability.<sup>4</sup>

The sustainability concept has its roots in ecology, as it was originally conceptualised within the environmental movement in the early 1970s. At this time an independent commission, led by the UN, presented a report where sustainable development for human progress across the entire planet was seen as a common goal for all nations (Grady, 2000). This UN report, called “Our Common Future”, became widely used as a planning document, and also resulted in the UN Conference on Environment and Development in Rio de Janeiro in 1992. In traditional development, the economy takes precedence in community decision-making; by contrast, in sustainable development equal weight is given to the economy, the environment and social well-being (ibid.).

The sustainability concept was later adopted and used in the field of organisation development as a way to define work systems<sup>5</sup> that strive away from intensity.<sup>6</sup> Thus, the key concepts are intensity and sustainability, which can be seen as opposite forces within work life.

Work intensity refers to the consumption of human resources – physical, cognitive, social, and emotional – in work organizations, while the Sustainable Work Systems-concept presents a vision for the future competitive organizations in which human resources are regenerated and allowed to grow. (Docherty et al., forthcoming b).

The vision for a “Sustainable Work System” is a complex one. Reality is contradictory. Different stakeholders’ legitimate needs and goals have to be balanced. There are the interests of personnel as well as those of owners, the needs of customers/clients as well as those of society as a whole, and – not least – there are the compelling needs of the global ecological system. Work systems find themselves amidst all the contradictory forces and demands that have to be considered and acted upon in order to realise potentials and generate values. Also, the concept of “work” itself is undergoing reconstruction. The boundaries between work and life are being eroded, and work intensity can be a conse-

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<sup>4</sup> This presentation is mainly based upon the book that is already mentioned: *Creating Sustainable Work Systems: Emerging Perspectives and Practices* (Docherty, et al., forthcoming a).

<sup>5</sup> “As a work system we understand a regulated collaborative activity on different levels: a group, a department, or a higher organizational unit” (Moldaschl, forthcoming).

<sup>6</sup> Large costs are estimated due to intensity in work life in Europe – some 20 billion Euros annually and the human suffering of many millions of workers (Docherty, Forslin, et al., forthcoming b).

quence. For example, employees may be strongly committed to the goals of their company, and continue to work even when on holiday.

### **The resource perspective**

Resource-centred workload theory (see Moldaschl, forthcoming) can be of use in going deeper into the definition of the concept of sustainable work system. The theory gives a basic understanding that is used in different perspectives on sustainability, some of which are mentioned below. The purpose of the theory is, according to Moldaschl, to integrate requirements and resources, and object and context, in a relational definition. Whether something is a resource depends on its relation to the context. A work system is non-sustainable if the reproduction of resources is not taken adequately into account. The theory focuses on the consumption and creation of resources in the processes of work. *Finite resources* are assets limited in the physical world (e.g. petrol). *Regenerative resources* are consumed in use but regenerated/recreated by work/human effort (e.g. food production). *Generative resources* are means for human action, created and amplified in their use (e.g. human skill).

If there is a contradictory relation between tasks, rules and resources, this will result in stress, overwork and social conflict. Divergent interests embedded in a context (e.g. contradictory job requirements or incompatible formal and informal objectives), where resources are lacking, may lead to a psychological workload which is problematic in relation to the context. In Moldaschl's view, having to cope with an undoable task does not generate new human resources.

### **A complexity perspective**

Yet another theoretical perspective may be of use in getting a grip on the sustainability concept. As stated above, the sustainable work system can be seen as a complex vision for working life. To better handle the complexity, a theory guiding us in how to interpret modern chaotic working life is useful. Theories of complex systems, used as metaphors, can offer such guidelines (Backström et al., forthcoming; Fitzgerald & van Eijnatten, 1998). According to this approach a fundamental presumption is that chaotic processes at one level (the level of parts/agents/holons) might lead to apprehensible patterns at a system level. For example, organisational renewal is not seen as something that can be implemented by managers. Rather, it is understood as something that emerges from interaction – regarded as an ongoing process between an unlimited number of actors who in some way or another take part and thus influence the renewal work. Influence comes from actors on the outside as well as from the inside of an enterprise, from below as well as from above in the hierarchy. This makes it relevant to take into account different aspects of a system when discussing the sustainability concept (as we have been doing in this report).

In the text that follows two particular concepts from complexity theory are used in the analysis of the empirical case, namely holons and strange attractors. The holon concept is presented by Backström et al. (forthcoming) as follows:

A holon is both an individual “whole”, and a part of a much larger whole, at one and the same time. (Backström, *ibid.*).

Through interaction, individuals can create a social holon resulting in collective learning that enables them to generate shared frames of interpretation. These collective frames provide the foundation for synchronic action.<sup>7</sup> In fast moving lines of businesses, interaction, and spontaneous or arranged communication and dialogue might offer a way to establish balance on the creative boarder between chaos and order.

There is the concept of the “strange attractor”, which refers to behaviour patterns. The power of habit makes us act in approximately the same way over and over again. We follow a track. But now and then, when we start to imagine a new way of acting and thinking (for whatever reason), a strange attractor is created in our mind. The more we get used to this new alternative, the more likely we are to decide to make a jump and move over to this new strange attractor, and follow the new track, i.e. to act differently. This provides a way of understanding what happened during the renewal work reported in our case study.

### **Sustainability at different levels**

Sustainability is of importance at several levels at the same time, societal, organisational and individual. And, in the defining work within the SALTSA network, these levels were approached from both sociological and psychological perspectives. Severe contradictions between levels have to be handled to reach a working conceptual cross-disciplinary definition of overall sustainability. Organisations are embedded in a broad social and cultural context that enables or restricts organisational practices. These practices, in turn, reproduce or change the context – in a relation of mutual dependency.

At a *societal level* a work system can be viewed as sustainable if it contributes to the social system as a whole – creating knowledgeable, healthy workers, producing goods and services of value, in a (re)generative way without exploiting people or environment, in balance with the surrounding society and nature. Good work is part of and contributes to the institutional frameworks, such as training systems, labour markets, workers’ participation, labour relations (Hancké, forthcoming) within which it exists. At the same time, institutional frameworks endow different parties with power resources that might produce different forms of intensive work. A sustainable work system does not stress socially produced

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<sup>7</sup> This theoretical reasoning is illustrated by the “shark story” that is presented further down, under the heading “Case description”.

resources or the social system as a whole, it rather contributes to generation and regeneration of resources needed for the common good.

At an *organisational level* a work system can be viewed as sustainable when it develops a potential for competitive existence and, at the same time, handles the constraints of economic competition in a way not to make employees sick and not to make the environment destroyed. On the contrary, development for employees is seen as part of competitiveness. A sustainable work system maintains or even extends the human, the social and the institutional resources of the organisation (as, e.g., the capacity for flexibility). It is supposed to use the workforce in a generative way that goes together with organisational survival and success. It is continuously developed to remove stressors and contribute to generate psychological resources (Kira, forthcoming). It is successfully thriving in often rapidly changing environments. To do this, it has to handle complex responsive processes (Backström et al., forthcoming) in relation to the surrounding world, through networks and continuous adaptation. The organisation needs an ability to generate shared frames of interpretation to be adaptive to changes in the environment.

At the *individual level* a work system can be viewed as sustainable when it creates an environment that allows the workers involved to grow with the work task and develop new qualifications and skills, new social relations, and to retain their health. In a sustainable work system, management consciously strives for the personal growth of employees as a means for development of production and competitiveness, and construe acceptable working conditions. Job demands are matched with resources, and mismatches are diminished. Individual potential becomes organisational potential through dialogue. Employees are supported to renew their psychological resources. They are part of a collective effort where they struggle with expanding and complex work realities and, at the same time, also strive to envisage and realise meaningful work and utilise possibilities to develop at work.

Work intensity might, at the individual level, lead to human resources consumption and result in burn out if disregarded. Sustainability means striving for individual potential for future coping with the challenges of work. This has long-term consequences with regard to cognitive and emotional development. Personal growth and the creation of psychological resources are, according to Kira (forthcoming), supported by enjoyment at work through such phenomena as “sense of coherence” and “flow”.<sup>8</sup> In the interaction between individual and

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<sup>8</sup> She describes sense of coherence as referring to psychological resources enabling coping with work; an employees ability to find something comprehensible, manageable, meaningful in any situation, that provides guidance through complex and dynamic work life. Flow is described as an experience increasing individual sustainability. It is moments of optimal experience and concentration in actual action processes at work that lead to enjoyment and coping (Kira, forthcoming).

work, she argues that local self-design processes can be developed to find the unique balance between employees and work. Growth of the self is thought to be supported by variable, clear and goal-oriented work, in balance with the employee's resources. In this way, the individual is able to build psychological resources that can be relied upon when encountering potential stressors. Making use of Kira's perspective, interaction and dialogue can be used as means for promoting the collective learning and self-organisation that make it possible for the individual to create and reconstruct meaning and understanding. In this way, the individual is better equipped to manage worry caused by continuous change and to foster personal as well as professional development.

In sum, our view is that the practical consequence of sustainable thinking is holistic by nature, since it encompasses the individual, organisational and societal levels. Sustainability can not be built on exploitation of any of those levels as they all effect each other. Ideally, equal attention is paid to quality of working life and competitive performance. Organisation structure is built to be liberating and to support continuous change processes. Learning in the work task as well as opportunities for interaction and dialogue are facilitated and continuously organised for.

The forming of the sustainability concept used problems with work intensity as its springboard. Having presented the background, we will now turn to the main perspective of this report where we approach sustainability from another angle. Rather than considering the work environment issue of intensity, our point of departure in this study lies in learning processes and conditions in the telecommunication industry. This is a sector where companies gain a competitive edge through the competence of their employees, making issues of learning critical.

## Learning through experience, interaction and communication

Theoretical aspects concerning learning through experience, interaction and communication are presented in this section, alongside learning demands related to processes of organisational change. The theoretical concepts in the study are first used as eyeglasses to perceive and comprehend the processes and outcomes of organisational change, and then related to sustainability issues.

Workplace learning – or perhaps, more to the point, work *task* learning – has implications for individual development over the life span and over the width of life. Both life long learning and life wide learning are dependent on the learning what takes place when work tasks are performed and talked about with others. Work tasks and situations represent ongoing opportunities for knowledge construction and re-construction. In fact, tasks and their surrounding conditions provide the main opportunities for learning and competence development (see, e.g., Dixon, 1994; Dixon, 2000; Löfberg, 1996; Ohlsson & Döös, 1999). Through task related intentions the individual learns how to make use of the

specific environment and meaning context through action (Döös & Ohlsson, 1999). If learning conditions in a workplace are not favourable – either because of too limited and confined work tasks or because of staff reduction and high work intensity – the potential for individual development is not used, and the organisation as a whole will suffer from having less capability to deal with change. In such organisations, both individuals and organisations are less likely to make use of the potential inherent in problems and friction.

Changing one's way of thinking or understanding means learning. In brief, learning can be described as a situated process of knowledge-construction based on action, with the learner as an active constructor of knowledge and know-how (see, e.g., Kolb, 1984; Löfberg, 1989; Piaget, 1970). The outcome of learning can be envisaged as having two sides. Inside the individual, it means constructing and reconstructing meaning structures (Dixon, 1994) or thought networks (Döös, 1997). On the visible outside, the results of learning are observed in changed ways of acting, performing tasks and talking.

Kolb (1984) points to the relation between learning and life span development when identifying learning as the major process of human adaptation. It relates to performance<sup>9</sup> on the one hand, and life long development on the other.

When learning is conceived as a holistic adaptive process, it provides conceptual bridges across life situations such as school and work, portraying learning as a continuous, lifelong process. (Kolb, 1984:33).

On the continuum of performance–learning–development, variation lies only in degree of extension in time and space. Döös (1997) developed the relation-making use of the two concepts “thought network” and “dimensional stance” (p. 222–224). Thought network refers to action related cognitive structures constructed and re-constructed in a situational context, whereas dimensional stance is a generalised level more closely tied to the individual. Through thought networks, perceived characteristics of a situation (e.g. problem solving, disturbance handling) are linked to action, and to the judgements and decisions needed for an individual to find an action path. Networks can be seen as situation connected reasonings that are more or less alike in similar situations. Such likenesses give thought networks stability and durability, although – at the same time – they are continuously changed through the person's thoughts and actions. To summarise, thought networks manifest themselves as action alternatives, and are tied to the situations in which they are constructed and re-constructed. Experiential learning takes place through the construing of these networks.

The dimensional stance is more linked to task execution and task definition at a general level, and – since it is more consistent over time and does not vary according to situation – it can be described as more related to the person. In, for

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<sup>9</sup> “Short-term adaptation to immediate circumstance” (Kolb, 1984:34).

example, machine operators' handling of disturbances to production, the stance has consequences for how the operator defines and deals with his work task. Stressing that a person's stance towards something is dimensional entails that it is built along a number of dimensions, each of which can be seen as a continuum for development. In a study of operators' disturbance handling some 15 dimensions of importance for how to carry out the work task were identified (ibid.). Thus, operators' stances varied in the degree to which thinking was dichotomised or processlike, or ranged along a dimension from frozen statements and explanations that ended too early to the operator having related explanations and insight into active use.

Both concepts are thus regarded as dynamic and changeable, albeit to varying degrees and extents. They are mutually constructed in interplay. The thought network concept is explicitly chosen to communicate possibilities for connections and development – in contrast to similar concepts named as cognitive structures, schemata and patterns.

Learning is described by Piaget (1970) in terms of processes of adaptation. Qualitative shifts in an individual's understanding are seen as accommodations that alter cognitive structures,<sup>10</sup> whereas experiences in tune with already existing structures are thought of as assimilations. In the life perspective several neo-Piagetian authors (e.g. Armon, 1993; Basseches, 1984; Kegan, 1982) have elaborated this idea, and described a stage divided process where individual development is connected to disequilibrium. The process continues in shifts between balance and the imbalance that occurs when a person is about to step out of the embeddedness of a given stage (Kegan, 1982). Sinnott (2001) treats post-formal thought as an in adulthood developed capability to deal consciously with issues involving competing logics, multiple truths and contradictions.

Similar ideas have been developed by Mezirow (see, e.g., Mezirow, 2000) who has adopted another terminology. He does not deal with stages but speaks of transformations that follow a disorienting dilemma and result in “a reintegration into one's life on the basis of conditions dictated by one's new perspective” (p. 22). Our perceptions are filtered through selective frames of reference. A frame of reference consists of both cultural paradigms and idiosyncrasies from our personal history. The frame of reference is revealed when individuals experience differences, e.g. through sharing narratives. If we do not, intentionally, make these frames visible, they tend to form our actions in ways we are not fully aware of. Transformation of these habits of mind and points of view is a painful process. This is because:

Our values and sense of self are anchored in our frames of reference. They provide us with a sense of stability, coherence, community, and identity.

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<sup>10</sup> Thought networks in Döös's (1997) terminology.

Consequently they are often emotionally charged and strongly defended. (Mezirow, 2000:18).

Before taking the learning issue onto the collective and organisational levels, it should be stated that the main conclusion of the above is that there is an important relation between the learning that occurs within work task related everyday experiences and life span/width development. Further, learning and development – in their accommodative and transformative natures – are not to be reduced to easiness and simplicity when in process. Although the outcome often is positive, the processes of changing dimensional stances and transforming habits of mind are at times demanding, and associated with shakiness, crisis, pain, and even chaos, if the learning challenges basic values and ways of understanding. For example, relinquishing existing work tasks and related competence is like walking on thin ice, before there is something new to hold on to.

### **Collective and organisational learning**

Within all teams and organisations, individuals are the ones who learn and carry their knowledge forward to the next situation, to other specific environments and meaning contexts, and to meetings with other individuals. We learn together, but learning is always grounded in the understanding carried by each one of us (see, e.g., Löfberg, 1996; Ohlsson & Döös, 1999).

Learning as a collective process means that individuals learn through some kind of interactive and communicative action. This is a learning process that creates the added value of synergy, via which what is learnt becomes qualitatively different from what any individual could have reached alone. Further, it entails learning that results in shared knowledge, in a similar understanding of something specific, and – grounded in this – an ability for joint action. Knowledge that is jointly produced has a more stable character than knowledge that is individually produced (Berger & Luckmann, 1966). Research within work life pedagogics (Döös, Wilhelmson, & Backlund, 2001; Granberg, 2000; Ohlsson, 1996; Wilhelmson, 1998) has contributed to our knowledge of the relation between individual and collective learning through communicative action (Habermas, 1996).

In making theoretical sense of collective learning, dialogue, talk and group reflection have mostly been in focus. Ohlsson (1996), in a study of collective learning in child day care, speaks of continuously ongoing dialogue, and highlights three qualities of the conversations. Personnel adopted “a narrative form, whereby they made their experiences available to each other; joint reflection, when they reflected on each other’s experiences and joint intention, where they developed joint strategies to treat a specific child or to cope with more general tasks” (ibid.: Abstract). This can be regarded as an interaction and conversation chain or process in which various degrees of participation and communality are

derived from joint images of reality and grounds for action. The relationship between individual and collective learning is thought of as activities representing three structural dimensions. In interaction with each other, individual group members move from individual to joint, from private to public, and from specific to general. In this sense, Ohlsson's line of reasoning has a strong affiliation with Dixon's (1994) usage of the concepts of private, accessible and collective meaning structures. These concepts refer to different context-specific degrees of being willing and able to make one's own thinking – one's own way of understanding – available to others.

Collective meaning is meaning that organizational members hold in common. These are the norms, strategies and assumptions that specify how work gets done and what work is important to do. (Dixon, 1997:26).

Using the term "collective" does not imply that everyone in an organisation holds exactly the same meaning; rather, it refers to a meaning that is close enough for organisational members to function as if there were total agreement. As Dixon (1994) points out, however, significant differences between persons are commonly found when collective meaning structures are examined closely. She also stresses that many "collective meaning structures are tacit" (p. 39), and that they are changing slowly as a consequence of day-to-day activities. By contrast, accessible meaning refers to the structures that an individual is willing to make available to others in the organisation. Accordingly, here lies the open, and thus more useful coupling between the individual and the organisation when new ideas are to be introduced and changed ways of working are needed.

In a rapidly changing world, collective meaning can have a negative impact on an organisation in that the organisation may not "realize that the collective meaning it holds is dysfunctional" (Dixon, 1997:26). In such situations there is a need for making the collective accessible. It is also not uncommon for people who want to implement change on others to try to communicate with others' non-existing meaning structures, i.e. with thought networks that people have not (yet) developed for one reason or another.

Transformative collective learning is a process where participating individuals get access to others' ways of understanding. According to Wilhelmson (1998) collective learning is seen when group participants broaden, shift and exceed perspectives. Transformative collective learning entails the transcending of the individual perspective in that the group forms a new and, at least for the moment, common understanding. In Piaget's (1970) terms, this could be understood as a kind of collective accommodation. In a more individualistic way collective learning can also take place as a question-answer activity largely mediated by telephone, web and mail systems where individuals create a kind of interaction space for solving problems, or for getting the bits and pieces of factual knowledge needed for new product development (Döös et al., 2001).

## **Learning demands related to processes of organisational change**

“We want our people to feel respected, treated fairly, listened to, and involved. We want a company that our people are proud of and committed to, where all employees have an opportunity to contribute, learn, grow and advance.” A Levi Strauss mission statement (Appelbaum, Hébert, & Leroux, 1999:241).

On the one hand people and organisations continuously change, and adapt without this being noted as at all remarkable. On the other, organisational change is frequently discussed in terms of resistance, opposition and striving against the wind. Here, this partial contradiction will be developed a bit further, and also related to contemporary demands for the learning and development of organisational members and leaders alike. In this context, it is important to shed light on the phenomenon of organisational change, since this report aims critically to reflect on sustainability, as seen in a high-tech company changing its organisation, so as to be able to meet increasing demands for efficiency and continuously changing competence requirements.

It is reasonable to start by asserting that it is genuinely natural and human to change. The process of adaptation (Piaget, 1968; Piaget, 1970) is a basic condition for human life, i.e. a process of ever and always ongoing incremental changes in an interplay between individuated subjects and their world or environment. We can go as far as to identify the ability and will to change as a condition for survival. At the level of an organisation there are – also in interplay with the company’s environment or surrounding world – small changes ceaselessly going on in and about daily activities and the conditions under which they are performed. Nobody stops to think for a moment that “now we are making changes!”. The thinking is rather in terms of improvements and changing something for the better or into something slightly different than before. People take their point of departure in what exists, and then enter small changes into the existing, within the frame of the commonplace, and frequently on the initiative of the individual organisational member (e.g. an operator, a teacher, or an engineer) him/herself.

But there are also organisational changes of quite a different nature – the large ones, seen as revolutionary, and mostly coming from up-above or from the outside. These are the difficult ones for people and organisations. The difficulties related to such major changes can be understood in the light of a typology where Porras and Robertson (1994) distinguish between continuous and discontinuous organisational development. We can assume that inertia and resistance turn up especially in planned changes characterised by discontinuity, i.e. when a change for some reason or another is perceived as a sharp rupture against the hitherto

existing – when there are gaps between the existing thought network and the ones that are called for. Since discontinuity makes the requested change extra problematic, forces will be mobilised to work for or against the change. It is not uncommon for people or employees to be said to be change reluctant. Individuals and teams are categorised as unwilling, or at least slow, at adopting to new circumstances. Resistance might come from ordinary organisational members as well as managers.

Thus, we have identified two kinds of changes: the sharp ruptures and the known and commonplace increments – i.e. discontinuities and the small everyday steps respectively. In terms of strategies for change, it can be said, with regard to the division between participative and programmatic strategies proposed by Hart (1999) that participative ones are more in tune with commonplace development, and thus less problematic. By contrast, a programmatic strategy may be more coherently related to discontinuous change from the view of the ordinary organisational member. The participative strategy for continuous improvements is built upon the presupposition that, as affected people participate, resistance to change will decrease. Dunphy and Stace (1990) also claim that non-participatory models of change can be justified, depending on the result of a strategic analysis of situations and circumstances. In a fourfold typology – partly similar to the one of Porras and Robertson – they differentiate between incremental and transformative/radical change strategies, each of which can be run collaboratively with participation and consultation, or by directives and coercive modes making use of force and power. Hart (1999) has concluded that it is difficult in practice to find an absolute programmatic strategy. In reality, strategies tend to mix. And in a complexity case we might therefore be likely to find veins of both participative and forcing evolution on both the incremental side and within the transformations characterised by a big radical shift.

Participatory strategies for change have commonly had a relation to employee empowerment, and can be traced back to work during the 1960s on “job enlargement, job enrichment, management by objectives and quality circles” (Appelbaum et al., 1999:245). Empowerment is defined as existing in an organisation:

when lower level employees feel that they are expected to exercise initiative in good faith on behalf of the mission even if it goes outside the bounds of their normal responsibilities; and if their initiative should lead to a mistake – even a serious one – they trust that they will not be arbitrarily penalized for having taken that initiative (Appelbaum et al., 1999:234).

Organisational characteristics facilitating employee empowerment are summarised as four levers: clear vision and challenge, openness and teamwork, discipline and control, and support and a sense of security (ibid.). Cressey and Docherty (forthcoming) relate this body of thought to an emancipatory aspect, and point out that “more humanistic and people-centred values emerge, which

view humans as the source of value creation in organisations”. Leading participation, empowerment or emancipation, is different from traditional leadership. Due to contemporary demands, leaders have to abandon managing through rules and formal instructions. Instead, leadership means to lead via people’s understanding of work and work tasks (Sandberg & Targama, 1998), a way of reasoning that Cressey and Docherty are attuned to:

When talking about what is active in the value-creating process ... it is the nature of design processes, forms of dialogue and the input of the subject that is at the centre of the discussion. How to apply reflexivity in design processes, how to maximise competence and learning, how to organise inter-subjectivity whether it be in R&D, project groups or in production teams, how to minimise uncertainty by increasing the subjects or groups adaptive response. In general this calls for perspective shifts that, on a number of dimensions, involve abandoning a simple, narrow perspective for a broader more complex one (Cressey & Docherty, forthcoming).

Companies develop in relation to contemporary global demands, changing markets and new technological possibilities. Today’s dominating issues in work organisational discussions are “creativity, commitment, reflexivity, learning, chaos, quality and dialogue” (Cressey & Docherty, forthcoming), i.e. the kinds of demands for the development of ordinary employees, or organisational members and leaders. Thus, rapid and decisive changes are not called for solely with regard to technological skills. There is also a need for the development of intangibles (Cressey & Docherty, forthcoming), such as dialogue competence (Wilhelmson & Döös, 2002) and new logics in the creation of trust (Grey & Garsten, 2001).

Managers and leaders are taking on challenges, e.g. by trying to envisage the combination of added value for the individual employee and profitability for the company through organisational change (Wilhelmson & Döös, 2000), in reaching a culture of growth (Angergård, Hamrin, & Weiss, 1998), in managing the knowledge creating company (Nonaka, 1996), in creating creative tension (Senge, 1996) and so forth. Following from the above, the carrying out of change processes in an organisation requires leaders and organisational members to learn new ways of doing and understanding things. The accommodating and transformative phases will at times be hard on people; misunderstandings and shortcomings will have to be dealt with, conflicts taken and resolved, outfashioned know-how left in favour of new tasks, and new competencies enacted. Thus we conclude by citing from Stenström’s dissertation: “The question is whether it is possible to catch the angels without raising the demons” (Stenström, 2000:122, our translation).

## Between theory presentation and empirical findings

Here, at the intermediate stage between presenting the theoretical setting and describing the empirical case, we make a presentation of the intended use of the theoretical concepts in this report. The above presentation of the theoretical setting aims at:

- a) introducing the learning perspective within which we make use of concepts and theory to understand and make sense of a specific praxis, and thus let it contribute to the theoretical grounds of the sustainability concept
- b) presenting a background of emerging ways of conceptualising sustainability, i.e. presenting the sustainability context we aim at generalising to when reflecting sustainability through our empirical case
- c) providing understanding of the learning processes and demands in organisational change that are useful for the interpretation of empirical findings when aiming at relating to sustainability
- d) providing an understanding of the nature of the experiences that the organisational members went through as they had to deal with innovations and changes, at the same time as maintaining the high speed in work tasks required because of competitive market demands
- e) showing, through drawing attention to subjects in recent literature, that the case study used for this secondary analysis provides us with a topical empirical context. Parts of the theoretical setting presented above elucidate the philosophy behind innovative thinking on part of the leaders and key actors in the case study.

Using theory and concepts as our eyeglasses facilitates the making of relevant descriptions concerning organisation and changes; in other words, it focuses our attention on circumstances and courses of events that are demanding for learning, and thereby for individuals and organisations.

Before entering the case description, it should be noted that the leaders of the innovative organisational change (to be presented below) were inspired by contemporary concepts and ideas – without walking into the trap of being concept driven in a prescriptive form. They were children of their age. The following list gives a hint of the contemporaneity from which inspiration was fetched: the organisational learning cycle and hallways of learning (Dixon, 1994; Dixon, 1997), team work (Katzenbach & Smith, 1993), intellectual capital (Edvinsson & Malone, 1997), to manage in a time of great change (Drucker, 1994), new work organisational forms when leaving bureaucracies (Morgan, 1998), creative tension (Senge, 1990), and re-engineering (Hammer, 1996).

# Case description

The empirical base for this report comes mainly from a unit within Ericsson Telecom AB.<sup>11</sup> This unit went through a thorough renewal during the period 1995-1999. New leadership took form, changing the field of activity and its ways of organising work (Wilhelmson & Döös, 2000). The unit belonged to the rapidly developing world of information technology where competition is hard and demands for learning and competence development are high.<sup>12</sup> We describe the birth, development and disappearance of this unit during some hectic years in the late 1990s. The learning issues we were studying dealt with management visions meeting realities and the conditions for learning. This meant that our original focus was upon work tasks and ways to organise production for the enhancement of learning and competence development.

## **The shark is approaching**

In a business that evolves as quickly as ours, it is not possible to take centralised decisions. We must develop an organisation that enables many colleagues to see the whole picture and take their own decisions – to understand for themselves what our activities need in order to succeed. The more people understand the way the market looks and in what direction we need to go, so that they can take their own little steps in that direction, the easier it will be, since the market is changing all the time.

If, when a change occurs in the market, we have to wait for the process of the C.E.O. discovering that it is happening, then that discovery filtering out to the rest of the organisation, and then decisions being taken accordingly – that would mean a five-year project! Far better if, instead, everybody were able to observe that something is happening in the market and ask themselves, what does that mean for the area I work in?

If so far we have been a whale swimming along, we must become a shoal of fish where all the fish register the danger signal and turn around instantaneously and simultaneously. At that moment we don't say, Danger! The shark is approaching! Tell the guy next to you! Everybody takes a left!  
(Manager, May 1999)

The case is an example of a unit trying to move in its own direction. It was leaving telecom and entering Internet telephony business, and tried to organise in

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<sup>11</sup> A large globalised Swedish telecom company.

<sup>12</sup> See, e.g., Dixon, Döös et al. (submitted), Shani & Sena (forthcoming), Werr, Norén, & Bryskhe (2000).

order not to lose sight of competence issues when busy doing the job. Competence was looked upon as a survival issue. The unit strived for autonomy<sup>13</sup> within the larger whole of this multinational company. A company with long traditions of hierarchy and rules that had turned into bureaucratic stiffness, according to managers in the unit. An important part of the change process within the unit concerned moving in the direction described in the metaphorical shark story above, i.e. reaching a situation where employees act as knowledgeable individuals making work task decisions based on their own interpretations of current realities. The quotation illustrates both the demands on competence development that were to be dealt with in order to survive in market competition, and the direction in which to move. The individual is now – in the world of Internet products and IP telephony – supposed to act as a fish in the shoal, to immediately be able to change in the right direction, to take the clever decisions that contribute to the improvement of the common whole. Rules, routines and hierarchical thinking prevailing in the old telecom world had to be replaced with understanding and autonomy. To take the lead in such a process required a shift to take place in the basic understanding of how work-related knowledge comes about. There was a need for individuals to be responsible and able to handle change. To keep up with a continuously changing world created a need for flexibility and learning. Organisational structures and ways of working coherent with and leading to such understanding and acting among the organisational members were thus required.

## Characteristics of line of business and of the change processes

In 1995 the unit is a local design centre (LDC) with 200 employees and part of Ericsson Telecom. Most of the employees are graduate engineers (approx. 60 per cent) with the main task of developing software for telecom products. The unit acts in an environment characterised by thorough and rapid changes in several areas. Telecom business in Sweden was recently deregulated and the company now operates on a global market. Technology in itself has undergone a fast development; hardware has become smaller, faster and diversified, and software tools are easier to use. The technology development has also brought on an ongoing merger between, and also a shift from, telecom to datacom. This creates new opportunities for new product development and new telephony services. All this takes place on a highly competitive market. Companies are competing through innovative product development and are totally dependent on human competence, which results in challenging demands on knowledge creation.

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<sup>13</sup> The unit was autonomous in some respects – e.g. being a free zone with regard to some rules, but clearly dependent in others, e.g. in terms of which business unit to belong to.

The unit was allowed to renew itself and found support as well as requirements for improvement from the management level above the unit in the Ericsson hierarchy. This raised high demands and expectations on the unit and its members. Despite all these changes, it was not one's ability to support oneself economically that was threatened, and we did not get the impression that people felt threatened in terms of risking their employment. Instead daily work continued and people were needed due to a shortage of software engineers. What was however required was a shift in competence, i.e. to bridge gaps of understanding when leaving existing knowledge and entering the new competencies. In characterising theoretically the changes that took place during the studied six years not only discontinuity (Porras & Robertson, 1994) and transformations (Dunphy & Stace, 1990) can be identified, but also periods of continuous change (Hart, Berger, & Lindberg, 1996) and incremental collaborative improvements (Dunphy & Stace, 1990).

## Visions and ideas

Visions and ideas were of major importance for the renewal work. The reasons for picking this unit as our case when wanting to deal with sustainability issues are several. The case is an example of ambitions and trials to manage sustainability. The aims and ideas of the key actors, i.e. the leaders, as well as the other dedicated and driving persons,<sup>14</sup> were clearly in line with sustainability in a number of ways:

- management had identified survival problems unless drastic changes were undertaken<sup>15</sup>
- jobs left in Sweden in the year 2005 (to compete with knowledge and competence in global competition)
- a sincere attempt to do good for individuals *and* for the company at the same time
- shed light on the possibilities to lead an organisation through visions, and there was emphasis on the importance of managers' visions for sustainability
- the ambition to make employees "embrace the whole chain" and develop a sense of responsibility that would enable each and everyone to take decisions.

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<sup>14</sup> "Key actors" ("eldsjälar" in Swedish, which literally means "leading lights" or even "fiery spirits") is chosen as a way of naming the group of people engaged in leading the renewal work. Several leading persons within the unit acted as driving key actors; alongside the two managers, there were the human resource manager, project leaders, product managers, competence coaches, and those working with quality issues. Quotations are from transcripts of interviews with these key actors if nothing else is stated.

<sup>15</sup> For example, a local design centre established in China accounted for 1/5 of the costs of the unit.

These aims and ideas evolved into explicit visions that were formulated and re-formulated as the improvement and renewal work was carried on during those years in the late 1990s. Visions were explicit and important as guiding lights for handling all the changes. The visions were – according to our interpretation – clearly in line with sustainability at several levels: sustainability for the nation, the company, the unit and the individual. The overall ambition of the two managers of the unit was to contribute to keeping and developing jobs in Sweden for the future. This meant to compete with knowledge and competence globally in telecom business, and also entering datacom and IP technology.<sup>16</sup> An important and unusual part of the vision was that “added value for the individual” was regarded as of *equal* importance as “profitability for the company” (Company pamphlet, 1997), which was recurrently stressed by the key actors.

The vision led to a striving for a non-hierarchical organisation. There was an ambition to make employees “embrace the whole chain” and develop a sense of responsibility for product development from idea to delivery. Reciprocity in responsibility for fulfilling shared assignments, keeping promises of delivery dates and quality, meant a qualitatively new and wider involvement in the whole product development process for everyone, and not simply for some small detail, as had been the case before. Each and everyone was supposed to take the lead in his/her personal working life, e.g. personal responsibility for competence development. Organising work in teams and small “virtual companies” were important means to reach these goals.

When the managers tried to organise work according to those ideas, it can be understood as a way of putting the sustainability concept into operation. This can also be seen as an example of recognising “the value of human resources for competitive strength” (Brödner & Forslin, forthcoming). Considering the individual engineer, the changes can be characterised as aiming at empowering renewal. Such empowerment might be problematic, imposing high intensity (caused by market requirements) on individual engineers. This issue, however, was not raised in the study, and therefore is not focused upon here.

## Organisational events

An overview of important events in the unit during the last part of the 1990s is presented below. The change process is largely viewed through the visions and reality descriptions of managers and key actors, i.e. from a managerial perspective. In short the main events were:

- 1995: the first merger and co-leadership
- 1996: teamwork and improvements, leading to ranking as No. 3 instead of No. 19

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<sup>16</sup> Internet Protocol (IP).

- 1997: renewal work, changes in products, technology, organisation and competence
- 1998: the second merger and cultural clash
- 1999: the unit is split and organisational principles are abandoned

### **The first merger**

The unit was formed in 1995, when two newly appointed managers (a woman and a man) agreed to merge their units and to lead the new unit together; aco-leadership took form. The work task was still AXE-software development within mature telecom products that are continuously changed and upgraded. Work was organised in the traditional large project hierarchy. At this time the unit ranked<sup>17</sup> as No. 19 out of 23 local design centres (LDCs ). The unit was:

... one of the most expensive LDCs, never delivering on time, never within budget, with a varying quality in its products and with a large employee turnover ... there was a thick layer of problems on top of everything that was good. (Manager)

The level of performance was not acceptable. Changes had to be made if the unit was to survive. A way to deal with this was to “establish some order in the projects”, and that was done through emphasising the importance of “keeping promises and delivering on time with quality”. This was the *first vision*, clearly articulated and quite down-to-earth. Weekly breakfast meetings were started as a forum to communicate ideas between management and all employees.

### **Improvement work**

In 1996 thorough organisational improvement work began. About 400 different improvement activities were carried out in order to reduce the gap between current reality and the vision. Large meetings were held with all personnel; external speakers were invited, and workshops arranged. All this aimed at making everyone conscious of the vision as they went about their daily work. The unit also moved into a new open-space building, making communication easier – a decision that was forced on the employees by the two managers, despite many individuals wanting to remain in their rooms and corridors. At this time some employees were even threatening to leave the organisation.

Teamwork ideas were implemented, initially against the will of several managers and other employees, with a two day teamwork training programme for everyone. Since the managers’ ideas and intentions were very much in line with top management’s visions for future products the unit was classified as a “free zone”, i.e. it was given partial freedom from bureaucratic rules and demands.

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<sup>17</sup> Index measuring software quality, delivery on time, price performance, productivity and service.

After a year the improvement activities were paying off, now it was ranked as No. 3 out of 34 LDCs. Did this give rise to complacency? No, the two managers raised new issues: – Where is the market heading? Now when we do things right, are we doing the right things?

### **Renewal work**

In 1997 the answer to the question of whether they were doing the right things was: – No! Thus, leaders at different levels within the unit had identified the need for change:

We started to look around. What is happening within telecom, within datacom, what is happening in the world? Telecom is declining, becoming a commodity, while datacom, infocom and multimedia are growing. And here we are, working on our signals. No one will pay our costs for products that can be taken from the shelf. (Manager)

Alternatives were considered, and a decision was made to go in a completely new direction – still software development, but within datacom and IP-technology in the Internet telephony business. The unit's management group<sup>18</sup> decided to leave telecom and get rid of mature cash cow products, and instead move into Internet telephony. The decision was taken through a show of hands.

In April –97 we gathered everyone in the unit and presented our new vision; “The consequence of this is that no one will go on working with the same products that we have today! The products we know well are going to be transferred to other units within the company. We are taking a risk but it is now or never!” And everyone accepted the idea! Everyone understood the importance! Yes, it was a great day! (Manager)

The managers, together with many of the personnel, undertook a thorough restructuring of the unit to make this change of products and technology possible.

To “embrace the whole chain”, i.e. to embrace every step in the work process, was now formulated as a *second vision*. Emphasising the importance for everyone, middle managers as well as engineers, to take responsibility for a wider task, i.e. to define one's task in a different way; for the engineers this meant to be acquainted with all the steps in a product development project. A new organisational infrastructure was built on the basic principles behind the vision. These aimed to support creativity and learning, to make new product development possible and to quickly create the right and competitive competence for immediate “just in time” use. Several important decisions were taken. One of those was to organise the work in small virtual companies – “Product Companies” for

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<sup>18</sup> Twenty people with different leading positions formed the executive group of the unit taking this decision.

production, and “Competence Companies” for staffing and competence development. To develop new competence was crucial due to the technological and product shift. The amount of changes caused worry and insecurity at all levels of the unit. Employees had to alter old habits and transform their ways of thinking and acting in their work tasks. All this was considered necessary due to competitive pressure from the outer world.

A search for ideas for new products began and was conducted in various ways – from visiting research centres within Ericsson to arranging brainstorming meetings with all personnel. The renewal work, from 1995 and onwards, had created a strong feeling of uniqueness and pride among many organisational members, not least among the key actors. Also among engineers new ways of working had been established that were of importance for competence development. These included teamwork and the sharing of responsibilities.

### **The critical second merger**

Early in 1998 the unit merged with another Ericsson unit<sup>19</sup> that was already working with Internet telephony. The leadership was now entering a critical phase and was formed as a troika with the Data-part manager and the woman manager from Tele-part taking the lead. The other Tele-part manager took on a more assisting role. The engineers in Data-part were experts on the latest Internet telephony, possessing the necessary datacom knowledge. Tele-part’s skills concerned the performance issues reached through the improvement and renewal work. The aim of the merger was to strengthen skills and competencies needed for the new types of products. Out of the merger evolved the *third vision*: “to make Ericsson the leading supplier of IP telephony services”.

However, the merger soon turned out to result in a severe cultural clash that was never resolved. Tele-part management did not realise the full importance of really getting the new organisational members “onboard the team train”. Data-part was supposed to bring in new competence, but it turned out that this competence was heavily loaded with a culture of “gurus, cowboys and experts”. According to managers and key actors in Tele-part, the culture was both rather elitist and hierarchical and at the same time “without sufficient order”, e.g. concerning delivery time and the documentation of the software development process. The two fundamental principles for managing work – to work in teams and to have autonomous product companies – came into conflict at this time. The key actors wanted the Data-part to work in teams, but found it impossible to directly give orders about teamwork, since they themselves had introduced and believed in the principles of autonomous Product Companies. Enforcement was not coherent with their own ideology. Instead they had to rely on, or at least hope for, the

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<sup>19</sup> From here on we will label those two parts of the unit in the following way: Tele-part is the original unit and Data-part is the new part included through the merger.

possibility of the idea being adopted through Tele-part communicating the advantages. Being an autonomous product company the Data-part however decided for themselves not to work in teams. Since the two parts did not share work tasks, the ideas and the culture of teamwork and shared responsibilities was never really transacted. Keeping the “telecom quality” level in the project process, which had been achieved back in 1996, thus turned out to be problematic.

This was a difficult period that was hard on several individuals – both at designer and management levels. Further, the troika did not function well. There was a vacuum at management level until the manager from Data-part was appointed as head of the merged unit. The female manager, who had been a key actor of decisive importance behind the improvement and renewal work, now left the organisation. As well as all this, the unit ran into problems with new, more traditional thinking at a higher Ericsson level in the USA. Traditional functional divisions were asked for; there was difficulty in getting decisions made; no support for the embracement nor for their small company organisation; and there were restrictions on employing personnel and hiring consultants.

### **The split**

In 1999 the unit consisted mainly of two parts, even if it looked like several small companies “on the organisational map”. In Tele-part the spirit was still there, still relying on the renewal principles and on up-and-coming products. In Data-part their product was developed and was reaching the market, which created new demands. New improvement work was discussed; and teamwork was now wanted here as well, as a way to handle problems of quality, economic control and on-time delivery.

At the beginning of the summer the unit was formally re-divided into its two original parts. Data-part remained within the same business unit, but the five remaining products of Tele-part were spread to diverse locations. This decision was taken at the level above the unit and was essentially based on the idea of organising around similar products that belong together. The enterprise needed to merge, but at the same time split its units to facilitate product development. This split however meant that some of the organisational principles (e.g. small company approach, competence coaches) were put on ice – for the time being.

In 2000, and up to the present, we can see how visions and organising principles live on. They are realised in different ways in several organisations within and outside Ericsson. Leaders and members with experience from this journey through change bring their ideas to new organisations.

# Fluctuations over time

So, over time there are many change processes in operation inside and outside the unit, and development is certainly not linear. Instead, there are quite a few ups and downs, and fluctuations concerning the four mentioned aspects, namely *products, organisation structure, organisational principles, and individual development*. The following is an account of fluctuations in these four respects, where we see phases of positive development and strength as well as of struggle and weakness.

## Fluctuation over time in products

The products are the solid ground for existence. The business unit's history shows obvious ups and downs in this respect. At the beginning the unit was poor on production (as its ranking showed). But the potential for better performance was good and – after a year of improvement activities – the unit was already at its peak, delivering upgraded software for the AXE telephony system. From this strong position management decided to change the field of activity from development of mature cash cow products in traditional telecom technology to an entirely new area of Internet telephony, with an emphasis on datacom technology. In moving from well-established ground, production once again became shaky. It takes time before new products are conceived, developed and finally sold. Learning the logics of datacom is time consuming and work tasks therefore take more time. But the decision to shift products has shown itself to be favourable in the long run. When the unit was about to split some new products were about to be launched in the market ensuring that its products once again had a strong position in the market.

The unit developed several new products that gained high market share and still do well, earning a great deal of money for the enterprise. Approximately 160 ideas were generated and evaluated, after which the most promising ones were developed in product companies. In retrospect we can see that these products often continued to live on in companionship with the managers, project leaders and engineers who had developed them from the beginning. A living product produces a sustaining environment for its developers, as it goes into more industrialised phases from just being an invention. Within the shelter of a successful product project leaders and engineers can make use of developed competencies and skills; they can rely on important experiences. Even if the product over time belongs to different units in the enterprise, a core group of people seem to follow the product on its way to maturity.

Also *within* specific development projects, during the phases of development of, for example, an IP-based video conference, there are dramatic – but smaller – ups and downs closely related to the new product and its market possibilities. There are frequent and drastic oscillations that the designers are intimately involved in; market signals are important for everyone, as the shark metaphor suggests. What is true one day is not valid the next. Sometimes it fluctuates rapidly between almost having a big order or not, having a customer interested or not, or only producing a prototype or suddenly having the possibility of a new, internal Ericsson customer.

## Fluctuation over time in organisation structure

The organisation structure also fluctuates a great deal over time. At first unstable in the very first merger, but stability was soon established as the two managers firmly took hold of development. The unit stood strong when looking for a partner to strengthen competence and credibility as it entered a new technology area. The second merger, proved not to be a very healthy one. The invited data-com unit had a strong identity of its own. It was not possible to integrate speedily or easily. Data-part stood strong, guarding its boundaries as a company within the company. It was the largest group, which continued working with its own product, which was very close to market launch. A strong product brings strength, importance and status to the people working with it. Tele-part was at the same time weakened by the transferring policy<sup>20</sup> and its new products were still in a more immature state. At the time of the split Data-part was less robust. It had difficulties entering a more industrialised phase, difficulties in delivering on time with quality, and was about to start on new improvement work.

When the unit ceased to exist (in 1999) its parts spread in various directions. Data-part had grown, and once again it became a unit in its own right. This unit continued with the same task, the same manager, and at large with the same core employees as before the merger one and a half year earlier.

Tele-part lost an identity of its own. One of the managers got a new appointment as manager of a larger unit within the enterprise, bringing two Product Companies with him. The other three products go in different directions; one is discontinued, two are moved to other Ericsson units. The new unit was too scattered geographically to make it possible to work in line with the developed visions and ideas. Most of the core people who are carriers of the visions, the key actors, spread in various directions. Energy of vital importance was also lost as the female manager left for another company outside Ericsson.

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<sup>20</sup> Due to the decision to give away its safe, money-making products; sometimes this also meant transferring project leaders and engineers as well as products.

The two merger decisions were made at the initiative of the unit itself, but the decision to split was made on a higher level in the enterprise. Being part of a large company, such as Ericsson, dealing with fast moving product development within tele- and datacom business, also entails acting in an environment that is rapidly moving and changing its structure. The general principle for organising is that every product should belong to the correct product area and business unit, which implies recurring adjustments and restructuring activities across the global enterprise as new products move along.

The phenomena of merging and splitting did not only take place at unit level. It was also occurring at lower organisational levels. A product company working with a specific product could more or less over night be merged with some external company in another country, e.g. a small firm in Iceland. So, the project and work teams are suddenly located in two countries, with different backgrounds and ideas for the product. Tensions evolve that have to be productively used, competencies have to be combined and developed. All of this heavily influences the everyday work of the designers involved. Suddenly they have to share daily work tasks with colleagues working in another country.

## Fluctuation over time in organisational principles

At an overall level ideas and principles guiding infrastructure development seemed continually to be growing stronger in the minds of managers and key actors. In practice those principles were meeting resistance, especially in the merger between Tele-part and Data-part. They found themselves in a kind of cultural clash concerning organisational principles. Tele-part had strong guiding visions; Data-part had a way of doing things that in many ways was contradictory to the visions. This clash was never handled openly, and it was probably not fully comprehended by the two Tele-part managers until it was too late. The basic organisational principles from Tele-part lived on until the split, when they finally collapsed. Theco-leadership of the unit during the Tele-part era was built on an important ground of a set of fundamental values, and the trust, intuition and freedom derived from not exercising prestige. This was not possible to reproduce within the troika.

The infrastructural means that were intended to realise the visions were mainly team work and small virtual product companies. Responsibility for products and competence was divided. Competence coaches were appointed for the benefit of the individual engineer, and with the task of staffing projects and virtual companies. Teamwork, development of organisational competence and learning in the work tasks were seen as the main road to new knowledge.

In the following sections two organisational principles are described in more detail – *small company approach* and *teamwork*. According to the managers and other key actors they were considered fundamental for bringing the guiding ideas

and visions into operation. We will now both go more deeply into details and switch to a more interpreting and analytical mode concerning these two principles. The aim is to obtain a deeper understanding of the working ingredients in this organisational renewal, thus enabling us to see examples of changes over time that have consequences for sustainability issues.

### **Small company approach**

At the time when the unit was established (1995) it was organised in accordance with traditional hierarchic and bureaucratic principles. As a way to support the product development process, managers wanted the members of project teams to experience responsibility and commitment in every project where products were developed, as well as power to make decisions. Instead of control from above carried out in rules and regulations, they wanted to create an infrastructure supporting self-governance. New organising principles were needed to achieve this, and they developed the idea of self-governing internal and virtual product companies. They were virtual in the sense of not having employees and of being treated as autonomous, but still being a part of the unit and the enterprise. Each product company was responsible for developing a certain product out of an innovation that was supposed to reach the market. The aim was to achieve the creativity and freedom of a small company with far-reaching autonomy. Product companies were clear and distinct parts of the organisation. The only person employed at the product company was its managing director, a powerful function concerning the product their company was developing. Everyone else was hired for longer or shorter periods from one of the competence companies. The amount of hired employees could vary from very few at the start of a project to almost a hundred at the later product development phases of a high priority product

Responsibility for production was separated from responsibility for competence development. Product companies and their managing directors were not in charge of competence issues. Instead employees belonged to competence companies, a kind of internal consulting agencies, each with a competence coach and some twenty employees. A matrix organisation was implemented with separate managers for production and for competence. An election was arranged where the employees were asked to choose their own competence manager/coach. Most individuals did get their first or second choice.

The aim of the matrix organisation was to organise so as not to lose sight of competence issues when being busy doing the job, since competence was looked upon as essential to survival. The coaches were responsible for individuals' competence development and salaries, for staffing his/her product company and for reducing the competence gap in the whole unit.

Competence Companies: Ensure that each member has a personally satisfying level of competence which fulfils the needs of our product companies and thereby contributes to the overall profitability. (Company pamphlet, 1997.)

So, what about the ups and downs of organising through the small company approach? The principle of small company approach made projects and products visible as the important core activity of the unit. Product companies grew stronger as their products grew stronger. Competence companies were more diffuse, becoming weaker as time went by. The competence coaches for many reasons had a difficult task in providing product companies with competent personnel. The unit suffered under an employment freeze that, especially in Data-part, resulted in a dependency on external consultants. This became a hindrance to knowledge development. Consultants were fully occupied to meet with deadlines and not very interested in teaching their skills to the permanently employed designers. In Tele-part consultants were used more as mentors with the aim of developing the competence of the permanently employed – an investment in the future for individuals and company alike. Also, learning takes time, competence develops daily, piece by piece, while actually developing new products. Furthermore the competencies needed were scarce, both outside and within the enterprise. These circumstances made competence coaches a kind of punch-bag in the unit. At times product managers did not get the people they needed. Most engineers managed their competence development on their own.

The competence companies and their managers, i.e. the coaches, did not have a very strong standing when the unit was split. The coaches felt partly abandoned by management. Perhaps, management never fully understood the potential in the coach system they had created.

It became evident to us as researchers, looking from the outside, that the competence coaches created knowledge uncommon in organisations. Our interpretation of this is that their work tasks required them to internalise and integrate the three perspectives and needs of single individuals, as well as of product companies and of the entire unit. They worked as a team with different levels of task sharing. The integrated knowledge they produced whilst carrying out their work tasks can be seen as a result of *corporate* problem solving, against a simultaneous awareness of the need to handle all three task levels jointly and without too conflicting results for any of those levels. The knowledge created in that way could, if used deliberately, have been of strategic importance for the company. They created unique knowledge thanks to their assignment for three different and perspective giving tasks. As mentioned, the unit management did not really discover this unintended and unexpected outcome and its extraordinary qualities.

After the split the small company approach was not continued in any of the new units. In Data-part, traditional values and ways of organising took over again

when it was back on its own (1999). The need for flexibility and creativity had diminished according to the manager. The industrialised phase they now entered did not need the flexibility that the inventive phase needed. Instead a more traditional line organisation was believed to be the appropriate way to organise.

In 2001 some of Tele-part's product companies joined a larger unit where, according to the manager, a new renewal work was to be started. Here, some of the key actors are re-gathered, with the ambition once more to apply the principles of small companies and teamwork.

## **Teamwork**

The most important tool for creating order, and for making visions and ideas come true was to organise work in teams. Major efforts were made for this from the beginning of 1995. Teams were created and trained at all levels in the unit – co-leadership, competence coaches as a team of their own, and engineers working in small teams (consisting of 3-4 individuals) in each project and seen as self-responsible and self-managing. Also, cross-functional teams were created for special tasks in the projects. This was part of the aim to strive for a non-hierarchical and non-bureaucratic way of working. Teamwork and shared responsibility for everyone are the means to make the small company approach possible. And also the means to create order and quality in the improvement work of the first year, leading to the excellent ranking position.

The teamwork principle stood strong during the first years. But employees came and went, and new teams were established in new projects without getting any team training. In Data-part which, perhaps unfortunately, was a product company in its own right, and also somewhat separated in terms of premises, teamwork was looked upon with suspicion. This part was a carrier of a totally different set of organising principles, even if those principles were never clearly formulated. Accordingly, due to various circumstances, the teamwork principle lost ground as time went by.

After the split Data-part changed attitude. After some time with a “wild-west culture” they discovered the need for a structured project process and teamwork. Their quality department, consisting of people from Tele-part, carries on with the establishment of genuine teamwork (see definition below) and characterises this task as the “heart of our challenge”.

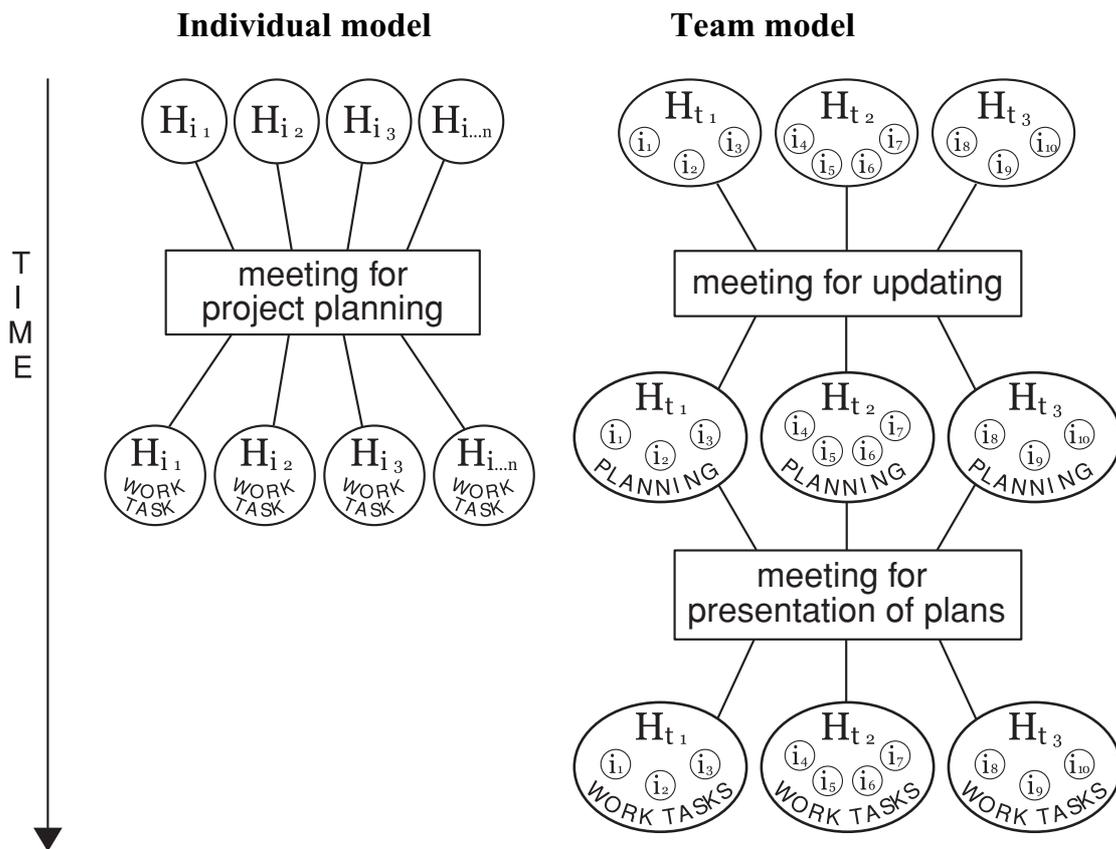
Teamwork was a core principle for the renewal work, without which it would have been difficult to reach such goals as empowerment, responsibility and reciprocity. We will go into this in more detail below, giving an example of how teamwork makes a difference. But first a definition of “team” according to a project leader with previous experience, both as competence coach and as product manager:

It is a group that isn't too big, maximum eight people, probably less, that have a common goal, that they strive towards during work hours, and that it's their main task to reach this goal together, which often, in our setting, means designing something for a certain point of time and quality ... and that must be the most important for each and everyone ... and also that you gain from the exchange so that you help each other when problems are around. (Project leader)

*How teamwork makes a difference in software development*

Inspired by the holon concept of chaos theory (Fitzgerald & van Eijnatten, 1998) we highlight here the differences between working with new product development as an individual and as a team member.

We compare the planning process in individually distributed work tasks (Individual model in Figure 1 below) with the same type of process when work tasks are shared in a team (Team model in Figure 1 below). The comparison aims at showing working ingredients or mechanisms that make a difference for individuals, in situations of time pressure and deadlines, and when ups and downs occur in, for example, products or customer interest.



**Figure 1.** Working in teams implies differences in the planning process within new product development projects (H=holon, i=individual, t=team).

In the traditional planning process, when work tasks are individually distributed, the project-planning meeting has a logistic character.<sup>21</sup> Individuals act as holons on their own before, during and after the meeting where they get information from the project leader, and from other individual holons working within the same project. The information concerns the state of work tasks, mainly in terms of whether they are on time or delayed. Each individual holon has his clearly defined responsibilities and pre-planned work tasks to cope with. These are tasks that no one else is much interested in.

A different planning situation or process exists when designers are organised in small teams.<sup>22</sup> Each team is responsible for a specific part of the product. So instead of individual holons we have the team holon where individuals belong together and share work tasks. When it is time for planning for the next period there is an updating meeting with the whole project. Then the team holons enter a process of communication where they do their own planning, jointly identifying and interpreting the team's tasks. Thereafter a new meeting at project level follows, where each team briefly presents its plans (tasks and time consumption). Finally they go back to work, with other up-dated team members around to discuss problems and share tasks with, although each individual holon still has his/her own responsibilities.

In this case, the specific team holons are not supposed to last over time. They are temporary constructions related to a certain work task period within a specific new product development project. Nevertheless, we consider the teams important in the construction of what can be regarded as sustainability at both the organisational and the individual level. This applies to the organisation, since decisions made are better understood and owned by the task executors who actually develop or test the products. And it also applies to the individual engineers. When recounting their experiences of working in teams, they say it gives them the possibility to learn from work tasks in a more efficient way. Participation in planning processes and co-responsibility in work tasks means belonging to shared processes of meaning construction. Close co-operation and mutual responsibility gives opportunities for collective learning. Working together in genuine teams makes dialogue an important working ingredient when the task is to develop new products, since this task is dependent on continuous learning.

The team model for project planning supports working in iterations and making decisions en route, depending on earlier experiences, encountered difficulties and possibilities, and also changes in demands and goals. It seems more suitable to handle the recurrent uncertainties involved in the new product

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<sup>21</sup> The Individual model comes from the testing of software for telenet systems in another Ericsson unit, from a study conducted during 2000 (Dixon, et al., submitted; Döös, et al., 2001).

<sup>22</sup> This example deals with developing software for a specially designed video conference in Tele-part; each team is responsible for a certain part of the system, like a conference management system or a client interface.

development of work. Working in integrated/genuine teams is, according to project leaders and competence coaches, a way of sharing knowledge. At the same time, it diminishes the need for management. A group can take on a larger task. The risk of misunderstandings is reduced when people need to talk to each other and work out a way of communicating that makes it possible to carry out a joint task. But the team organisation is also preferred by unit management because it makes it more difficult for employees to resist peer pressure. There is also a risk that peer pressure in teams might increase work intensity for individuals in their struggle to meet deadlines.

## Fluctuation over time in individual development

At the individual level sustainability fluctuates, not only due to intensity but also to connections to the above-mentioned organisational principles (small company approach and teamwork), and further connections to products and product development. How the individual can profit from experiences and go on to new tasks in a sustaining way seems to be connected to work role and work tasks. Managers and other key actors talk about their experiences in quite a different way from engineers. To lead renewal work gives managers a general perspective by learning about organisational principles and strategic matters. To concentrate on technical development in one product, or part of a product, gives the engineer fresh factual technical knowledge alongside the competence to co-operate to attain a common goal.

### **Managers and key actors**

Managers and key actors get stronger when they create visions and transform them into organisational principles used to build organisation structures. The strength comes to a large degree from being a group of devoted people, who talk a lot about relevant matters and learn from reinforcing new ideas. When the common frame falls apart, they go in many directions, truly disappointed, since their visions did not seem to be strong enough to keep their unit together. They are weakened for some time, but then find new grounds to start over again. As the key actors split up and go in different directions, so do their visions and ideas. The specific unit disappears but the individuals go on, and ideas and ways of organising are spread as the key actors meet with new people in other organisations. Well-developed relations between people, like those between the key actors are also sustaining over time. With values, visions and goals built out of common experiences, relations live on. One year after the split, one of the managers starts to gather some of the key actors in his new unit; together, they will re-use the experiences they have shared together.

The female manager is asked to start a new firm, with connections to Ericsson, in England. Here, she develops her ideas and visions further. How to organise work is part of the mission, since this firm wants “to be *the* role model software organisation for small and medium enterprises world-wide”. Innovative organisational design thus continues under new joint leadership – albeit more asymmetric given that it involves both co-working and simultaneous coaching of the less experienced partner.

In a follow up inquiry, one and a half year after the split, the managers<sup>23</sup> and those working with quality issues point to the insights that employees *do* grow with extended responsibilities, and that broadly generated ideas *can* create new products. It *is* possible for a unit to change its field of activity as well as its competence and its organising principles. This is a deep experience for them, and at the same time they sound a bit surprised: we really made all those changes! They themselves still work in the changing environments of the tele/datacom branch, and use their experiences daily in new work tasks.

The managers point to the various lessons they have learned in order to be more sustaining in renewal work. They emphasise the importance of their co-leadership; it was only together they could have created the strength needed to keep on struggling when problems arose (Wilhelmson & Döös, 2000). Sustaining in the task of leading renewal work is not easy on your own. At the same time as there is a need for flexibility, the struggle for implementing new ideas and visions may lead to the retaining of them as “sacred cows”. According to one of the key actors, it is important to be aware of the risk of being trapped in one’s own visions, and not allowing continuous improvement after a goal has been attained.

Different ways of organising might be useful at different phases of product development – flexible small companies in innovative phases, traditional line organisation in more stable, industrialised phases. But here opinions differ among the participants of this journey. On the whole, differences in philosophy and fundamental approach concerning organisational principles have to be handled when organisational parts are to be integrated. It seems to be a good idea for managers to make clear the underlying assumptions behind what is said and done.

### **Engineers and developers**

The unit was initially part of a large and hierarchical system for project planning in its function as a local design centre. This system had made employees unaccustomed to taking responsibility for the whole, with small possibilities to make any decisions on their own. Control was at a detailed level and not exercised from within the individual; every person was a small part in a long chain,

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<sup>23</sup> The two leaders of the unit, several competence coaches, one product manager, and the HR manager.

which was impossible to overview from the viewpoint of the individual engineer. To change all this was part of the vision. Management had explicit ambitions to strengthen individuals' capacity to manage new work tasks as well as work life in the long run. Each individual, as well as every project, was supposed to be co-responsible and not just participating. The individual is expected to "sit behind the wheel" in his/her working life, not in the back seat. In a managerial vision this implies that the organisation obtains built-in mobility and flexibility (as in the shark metaphor). Since changes are so fast in this business, it is impossible for management to keep track of them and to direct competence development.

Encouraging autonomy and entrepreneurship combined with coming closer to the customers and the market create a bias for action. (Company pamphlet, 1997.)

The broadening of work tasks was meant to make people act consciously, be well tuned to each other and to the overall task, and to get the product out on the market on time. This meant being involved in new product development in a way where the individual engineer comes closer to the customer and the product as a whole, and not only working with some small and deep detail of his/her own. To do this the individual needs information and knowledge of the project, the customer, competitors and the product, as well as special knowledge of the task of one's own team. Knowledge of this kind is strengthening; we see it as the foundation for co-responsibility.

Working in a business where change is ever-present means that designers become skilled at re-thinking and re-starting. To handle a changeable reality people seem to develop strategies with the function of finding something settled and solid that goes beyond what is changing. How this is done differs of course – depending, for example, on the situation, person or task. To play down the change through identifying similarities to earlier and hitherto existing circumstances is one way. Looking for reasonable and sensible explanations is another. To set up private goals like developing one's own competence also supersedes temporary changes in work tasks and projects. Competence is hard currency, and there is a desire to be valuable on the labour market. To the feeling of stability belongs also the knowledge that problems are always around to be solved. It is part of the work task and belongs there, as do uncertainty and vagueness to the commonplace. In one way or another each person forms his/her task and uses it as some kind of handle to hold on to. Changing tasks has become a habit, you leave the old task behind and grab the new one.

If only you know how it is supposed to be, what it looks like. So that you get hold of the task. You get acquainted with the new, so it works out well. (Engineer).

Many engineers/developers have a strong identification with the work task,<sup>24</sup> as they enjoy being at the technology frontier. To acquire new knowledge is for most engineers of great sustaining importance in their career development. In the follow up inquiry the engineers referred to new technical knowledge as the most important result of all the changes that took place in the unit. The painful technological shift, to start developing Internet telephony applications, imposed high demands on learning for individuals, and this strengthened their standing in the long run. Perhaps this is of extra importance when the work task is new product development. When products succeed, engineers' standing is improved. When products fail, they go on to the next project hoping it will be a better, more successful one. Engineers and developers also mention experiences of how to work in projects and groups as important for the learning they acquired in the unit. Through this they built new contact networks. They appreciate the competence they got from working collectively, and having learned the importance of how to develop good project processes, and how to keep a project in good order. But at the level of each product company, they did not appreciate having two managers (i.e. product manager and competence coach), although the important thing is not the organisational form. What matters is security or insecurity in the product development process, to be able to trust information given. This was the start of their new working life. When the unit was divided and the organisational principles were no longer in use, the engineers stood strong with new knowledge.

## Fluctuations and the concept of sustainability

The case points to the importance of time and phase. Reviewing a period of six years shows that the occasion chosen for when to look for sustainability in an organisation makes a big difference, since we are dealing with processes that are not synchronised. Over time, products, organisation and individuals go through phases of development that are not always in tune with each other.

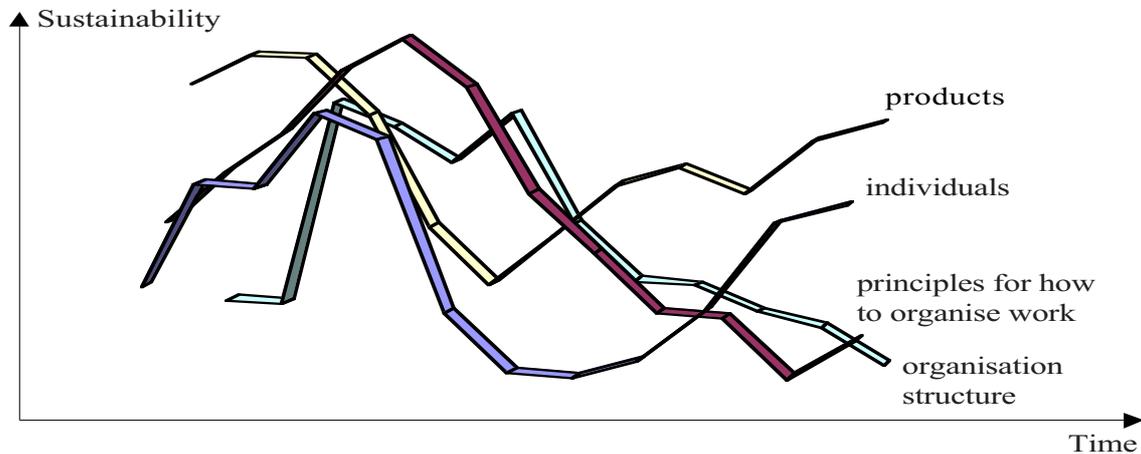
When we look at an organisation and its members at a specific time it is important to remember that the picture we see is only valid for the moment, especially in quick moving spheres of business. When it comes to understanding sustainability we need to look upon it more as a process, continually changing, and also varying in different aspects and levels of the whole. Change and development go hand in hand and consist of many phases alternating between pain and harmony, disorder and order, worries and confidence.

In this case, at the time the unit split, products stood strong but the small company structure fell apart. Data-part remains within the business unit while the remaining five Product Companies in Tele-part go on to other business units

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<sup>24</sup> Something that might also easily lead to unhealthy intensity, as mentioned, among others, by Brödner and Forslin (forthcoming).

depending on where similar products are being developed. Organisational principles disappear, at least for a while, as the key actors are spread. Individual engineers stand strong together with their products – going on to new units. Each manager moves on to new leading positions. People find new tasks, being an experience richer. These ongoing processes can be illustrated as in figure 2.



**Figure 2.** A schematic picture, trying to visualise the ups and downs of sustainability over time and in the four different aspects of the ongoing business.

At the very beginning production was poor, organisation structure was weak, managers were struggling for improvements in organisational principles, and employees were not accustomed to being responsible. The improvement and renewal work caused a lot of painful and threatening changes for both middle managers and designers/engineers. It was not possible to carry on with old habits. Before the merger with the datacom unit this laborious work had paid off; production was highly rated; organisational principles were highly regarded; and the unit was no longer threatened. Teamwork along with good planning processes for projects had been established as organisational principles. Employees were to make decisions for themselves, e.g. choosing which competence coach to belong to, which project to work in, and which new skills to develop. This was sometimes hard on the individuals. “It was like applying for a new job,” one engineer said. The co-leadership was strong, especially together with other key actors. People in the unit had become proud of themselves, according to managers self-esteem was higher.

Soon after the second merger the picture becomes more blurred. New products are developing, but it takes time for them to reach the market. Organisation structure is once again weakened; the two units remain different parts and do not integrate into one whole, which to some degree depends on differences in core values concerning organisational principles. Data-part is not interested in teamwork or detailed process planning. The principles are weakened, no longer seen

as the obvious way to organise work, even if Tele-part still goes on working in that way. Competence coaches encounter difficulties in staffing the Product Companies now, when they all need more people than is available. Individual engineers are not so disturbed by all this; they are fully occupied with interesting work tasks and learning new skills. In Data-part engineers also struggle with intensity problems, being too few and having to depend on consultants to a high degree. Managers have problems being three leaders. This does not work out very well.<sup>25</sup>

Although the unit and the specific small company organisation have ceased to exist, and although the change processes – no matter how well-meaning – along the way have caused individuals pain and suffering, the reality is too complex for us to say that this is not an example of sustainability. Visions, ideas and ambitions live on, so do products that successfully reach their customers. Organisation principles are reinvented after some time. Individuals earned new competence, maybe with a larger capability to manage change? Contact nets and relations are built upon in new environments. In this way new resources have been generated (Moldaschl, forthcoming) – especially for the company through the creation of new competitive products, and for individuals in gaining new competencies.

When the pod finally bursts (as the unit splits up) seeds of ideas are widely spread, in all the directions where individuals go. Individual holons with rich experience of organisational renewal find roots in new environments where they, with different levels of opportunities and possibilities, make use of their experience. In this way the struggles and the pain, as well as the happiness and the creation of new thoughts and experiences, can be re-used in new settings. So, sustainability hosts and covers strengths as well as weaknesses. Sustainability for individuals and products seems to go on within and without the unit – at least in this kind of business with the task of new product development, living under the conditions of short product cycles and sharp competition.

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<sup>25</sup> We are aware that many power games must surely have occurred on several levels during the journey of the unit, but since this was not the aim of our study we have chosen not to look upon renewal work from that perspective.

# Discussion and conclusion

The prologue to our case tells the story of two units entering into a successful marriage with joint leadership at the business unit level of a large bureaucracy. Act 1, and the two leaders and other key actors succeed in improving the ranking position of the unit through improvements to work processes and organisation. In Act 2 innovative ideas continue as a renewal of organising principles and a radical shift of products. In Act 3 the unit marries into quite a different culture and enters a critical phase leading to the Final Act where relations break up in the closing scene. The Epilogue however, announces various islands of continuation. Several key actors and also ordinary organisational members pursue the line of organisational development they have learned, and sustain in working in the same spirit and with product development within the new technology.

The learning perspective introduced in the theoretical section has been used in order to enable description and comprehension of a practical case of innovative organisational change, with the aim of relating it to sustainability for problematisation and critical reflection of the concept. This way of approaching sustainability will hopefully contribute to partly challenging the concept. Thereby, our data are generalised into the theoretical frameworks of sustainability. It is however important to stress that what can be learnt from this rapidly changing environment might not be of immediate relevance to more stable and mature activities.

How then can the concept of sustainability be understood and perhaps further developed in the light of this case? The studied unit ceased to exist. Does that imply a case of non-sustainability? We find a yes or a no to that question highly inappropriate, and would prefer arguing to keep the complexity of the case and its contradictions throughout the conclusions. To only relate sustainability to organisational level, in this case to the unit, definitely seems to be a too narrow way of looking at it. Indeed, the concept of sustainability covers a complex phenomenon when seen over time and in different aspects. *This case demonstrates the necessity to problematise the concept in order to host the requirements of dealing with high complexity and contradictory demands.* Empirical findings show some of the complexity that is handled when managing non-synchronised processes. Periods of weakness and struggle seem to be the cradle for the thinking and action that leads to transformation and change, which open the way for continuation.

To sustain involves the capacity for change, both at an organisational and at individual level, and it is not the same as harmonious living. The decision to change field of activity and develop software for Internet telephony can be seen as a leap into a new “strange attractor” (Backström et al., forthcoming; Fitzgerald

& van Eijnatten, 1998). To handle this kind of change invariably also involves pain; it has the character of transformative learning (Mezirow, 1991). Despite ruptures and discontinuities (Porrás & Robertson, 1994) it was possible for the leaders and other key actors to reach the accessible meaning structures (Dixon, 1994) of the organisational members. When successful, this was done through extensive communication on all levels of the unit and on purpose – especially thanks to one of the joint leaders who possessed a highly developed skill in interpreting and dealing with underlying reasons for people's acting.

When surrounding conditions put pressure upon people to alter cognitive structures, their ways of thinking, this can have some very painful aspects. It can be seen as a process of accommodation (Piaget, 1970) at the level of an organisation. But in the long run, it is such laborious development and learning that can enable an organisation to cope with change. To act as an ostrich and stick one's head in the sand is not sustaining in this line of business. Rather, to ask the question "Are we doing the right thing?", and to act upon the answer "No!", was crucial in many ways. It contributed to competitiveness in high-tech development within the enterprise; new products were invented, employees developed new skill, managers developed new organisational thinking.

In the changing world of telecom business sustainability brings the issue of learning to the fore. Learning, in the sense of being able to reflect over and make use of experiences, makes the individual more capable of handling change in future situations. Isaacs's (1993) reasoning about the mechanisms and processes of dialogue points to the time consumption of collective thinking, and (Bjerlöv, forthcoming) stresses the importance of slowing down and sees reflection and dialogue as useful ingredients, inducing a slower pace. Workload and intensity are quite all right for humans, *if* there is "an afterwards" for recovery and reflection. In the work life of today this is often not the case (Brödner & Forslin, forthcoming), especially not in the tele- and datacom branch, with its shortage of skilled people around the shift of the millennium. Engineers are often thrown into a new project before the first one is finished, with no rest in between and little or no time for reflection on experiences made. In this case, teamwork could be viewed as an ingredient causing slowing down, i.e. offering opportunities for – and also requiring – reflection and communication. If "Holon capacity is the holon's ability to operate with greater mindfulness, expanded awareness, controllability and responsibility" (Fitzgerald & van Eijnatten, 1998:267), then we can see that the team holons have the possibilities to develop those aspects to a larger extent and with other qualities than was possible for the individuals when functioning as separate holons. The teams develop a deeper and widened understanding of the task, and it might be easier for a team to set limits to demands that exaggerate ones' possibilities. In this way working in teams can operate in favour of sustainability for individuals. However, teamwork can also impose

more demands or loyalties, and problematic boundaries might turn up between teams.

Knowledge can be developed in a team that works close together, both in doing the work task and when it comes to interpreting information of various kinds. Jointly, it is easier to make sense of information and develop new, transformed knowledge out of each and everyone's own experiences. Knowledge that is jointly produced has a more stable character (Berger & Luckmann, 1966). In this respect collectively created knowledge can be an important part of sustainability for organisations as well as for individuals, since it brings with it a broader line of perspectives, namely several persons' knowledge and experience (Wilhelmson, 1998). The knowledge thus created will in turn probably work in the direction of speed and efficiency, since employees are able to handle extended work tasks in a more qualified manner.

In this work environment, sustainability for individuals to a large extent seems to be to gain the good experiences and self-esteem that enhance the possibilities to go on to new tasks in new similar environments. The individual finds sustainability in his/her own development of competence, making use of changes, seeing them as opportunities to work with new products and regarding work process as learning. The main importance then, is not whether a specific project, product or unit survives. There is always a new task to define and go on with. As changes are struggled through, the individual makes experiences that are useful for future work.

The vision of the empowered engineer developed by managers and key actors can be seen as an example of how prevailing emancipatory concepts concerning man and knowledge is of importance for the possibility to create work conditions which can contribute to sustainability for the individual employee. The case can be seen as an example where management tries to put into practice the ideas of participation (Hart, 1999; Hart et al., 1996) and empowerment (Appelbaum et al., 1999), advocating ways of working and thinking where more humanistic and people-centred values emerge without reducing the importance of company success.

To look upon individuals as holons in their own right, jointly building an organisation, might help us see the importance of giving individuals the opportunity to grow strong, to sit in front of the wheel in their working life. For the individual engineer to have the power to make decisions for him/herself and the team he/she belongs to were of great importance to the two leaders in this case. As mentioned, at the intermediate stage between the theoretical setting and the case description, they were influenced by contemporary ideas concerning teamwork and organisational development, and together with the other key actors prepared their own mix adapted to the present reality. They were inspired by new ideas and concepts, but without being concept driven. They developed a skill both in creating and communicating ideas and visions; new accessible and later

collective meaning structures (Dixon, 1994) were established; new organisational forms were created. In this way, the leadership to a large extent was more of a “process of coordinating efforts and moving together as a group” (Appelbaum 1999) than one leader’s dominance over a group of followers. Whatever happened to the unit, many individual employees went on strengthened to new tasks, more knowledgeable and more experienced.

## **Conclusions**

In this report we have tried to identify some of the means and processes that were of importance for the renewal of this unit. The unit did not sustain in this case, but ideas and visions did, as they were carried on by individuals and groups that had made the experiential journey themselves, i.e. by having transformed and made sense of successes and failures.

In conclusion, *sustainability can be understood as the ability to interpret and deal with complexity, alterations and dynamics*. Developing new products and adjusting the organisation to cope – through creating a new organisation structure, developing new organisational principles and supporting competence development, all at the same time – can be regarded as an example of a serious effort to reach sustainability. Learning is a key feature in such a developmental process.

Discussing sustainability finally requires both an awareness of which aspects to include and consider, and a long time perspective, long enough to experience the different phases of ups and downs. The results of our analysis point to the importance of focusing on several units of analysis when aiming at understanding sustainability in practice as well as a theoretical concept. Albeit an important endeavour these requirements certainly pose problems for the possibilities to empirically identify sustainability at a specific workplace at a specific time. Thus, this contribution will be a challenge for the developers of sustainability theory to deal with. Hopefully, it can also add some relevant insights into practical strivings for a sustainable working life.

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# Appendix 1: Material and methods

This report is part of the research project “Learning in organisational renewal – a research project in an innovative high-tech environment”. The aim was to obtain knowledge about visions that meet realities and the learning processes in a high-tech company that was changing its organisation to be able to meet with increasing demands on efficiency and continuously changing competence requirements. This report emanates from a secondary analysis of collected material.

## Case study and generalising principle

With the aim of reflecting sustainability as a phenomenon, we used the empirical material from a qualitative case study that offered possibilities to discuss the phenomenon in its everyday context. Yin identifies a 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 (Yin, 1989: 23).

Case studies offer possibilities for triangulation, with its original link to validity issues. Triangulation concerns the process of inference and the drawing of conclusions. The idea behind triangulation is not to trust only one type of data but to make use of different data sources, which will – when pointing in the same direction – make the conclusion more valid, and when pointing in different directions – force the analysis to go deeper.

In accordance with the purpose of the study the generalisation principle is not statistical – to make an inference from a sample to a population – but analytical (Firestone, 1993; Yin, 1989). In analytical generalisation there is a striving to examine whether results can provide a supplementary input of empirical data into a certain theoretical domain, and thereby act as an aid to theory extension. The theoretical domain that we are here wanting to contribute to concerns the sustainability concept. Firestone states that:

Analytic generalization has more promise, partly because there are more ways to make links between cases and theories. One can look for threats to generalizability within cases. Critical and deviant cases can be used to explore or extend existing theories. (Firestone, 1993:22).

Providing a rather detailed and extensive description of the unit's change processes also opens up for the kind of generalising that Firestone (1993) calls "case-to-case transfer" – where a thorough description of context enables the reader to determine whether results obtained in one context may be utilisable in others.

## The overall aim and research questions of the project

The overall research question dealt with learning, i.e. both the individual and the collective learning that occur when management's visions meet reality in an innovative organisational change. Innovativity impose demands on organisation members to change their conceptualising and understanding of work and work tasks. We were interested in how such understanding interacted with the acting and actions of individuals, teams and the work organisation.

The research questions for the primary data collection were:

- What is taking place when one tries to create and maintain a new working culture and how does this influence the work task related understanding and thinking of individuals and teams, as well as the structure of the organisation?
- What demands do the work tasks and the new ways of organising work impose on learning, for individuals, teams and the organisation?
- How do the members of the organisation look upon learning within the task, and how do they gather new information, new knowledge, short cuts to experience, space for individual and shared/collective reflection, opportunities to try one's own ideas?

Thus, the original aim was to obtain knowledge about learning processes in a high-tech company which was changing its organisation to be able to meet with increasing demands on efficiency and continuously changing competence requirements. *Using this case for a secondary analysis offered an opportunity to reflect upon the issue of sustainability over time, in a rapidly changing environment.*

## The studied organisation

The specific organisation in which the study took place was a small unit within the large globalised Swedish telecom company Ericsson Telecom. The unit was a local design centre (LDC). In 1995 the number of employees was approx. 200. Most of the employees were graduate engineers (approx. 60%) with the main task of developing software for telecom products when improvement and renewal work starts, and developing Internet products (e.g. software for Internet telephony when the unit was divided five years later). The unit acted in an

environment characterised by thorough and rapid changes in several areas (technology, market, products, task of the company, organisation). Since the development of the unit and its innovative organisational changes are the focus of this report, relevant information characterising the unit is found in the main body of the text, under the heading “Case description”. In that section two important parts of the unit are labelled as Tele-part and Data-part. Tele-part is the original unit, and Data-part is the new part included through a merger. The main empirical base of the study is obtained from managers, key actors and engineers in Tele-part. The change process and reflections of the leader duo are also described in a special publication (Wilhelmson & Döös, 2000).

## Data collection and documentation

Data cover the period 1995-2001. During autumn 1998 several preparatory visits and talks were held with managers and key actors. Some visits were also paid to sources of inspiration explicitly mentioned by the key actors. The main data collection took place during four months in the spring of 1999, mainly through rucksacking, i.e. following a person during his/her work task execution for a day or so, small talk, informal observations, meeting attendance and semi-structured interviews. The study involved management, project leaders, competence coaches and quality people as well as ordinary organisational members (designers/engineers). After the main data collection, there has been sporadic but recurring contact with representatives of the unit.

In the autumn of 2000 a joint and retrospective interview was held with the two founding managers, and a simple e-mail follow-up inquiry was made with 13 former interviewees and other contacts from the unit (ordinary organisational members as well as managers and key actors).<sup>26</sup>

Several leading persons within the unit acted as driving key actors, along with the two managers, who acted through joint leadership, and together started and led the renewal work. There were the human resource manager, project leaders, product managers, competence coaches and those working with quality issues.

Semi-structured individual interviews from spring 1999 came to 16 in total. They were tape recorded and transcribed word by word. The 16 individual interviews were held with unit managers (3), quality manager (1), C.E.O. of virtual product company (1), project leader (1), competence coach (1), secretary (1), ordinary organisation members, software designers/engineers (8). One of the managers, the competence coach, the secretary and three of the designers were women. Three of the designers were of nationalities other than Swedish.

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<sup>26</sup> Thirty-five people were mailed to, 7 were never reached, 15 did not answer, 13 answered – among them both engineers and leaders of different kinds.

During the project, additional data concerning the unit were collected and compiled by a student (Silfver, 1999). She interviewed five ordinary employees (designers/engineers) and three consultants concerning learning in project based work. We also utilised these empirical data. This material and one of the interviews with unit managers were from Data-part.

Two group reflection sessions were arranged – one introductory (in December 1998) with the tape recorded reflections of five key actors<sup>27</sup> concerning direction giving concepts (see Appendix 2), and one summative (in September 1999) with most of the competence coaches where extensive notes were taken.

One of the unit's product development projects was especially chosen in order to study the reality of visions from the perspectives of engineers/employees. Seven of the eight interviews with ordinary organisational members were from this project. Six visits were paid to this project, and they consisted of a mixture of attendance of weekly project meetings and project planning meetings, work observations, nine documented informal talks at desk edges, rucksacking the project leader for a day. Various documents concerning the project, its four sub-teams and their work tasks and planning were also collected. Within the focused project four meetings were attended. Outside the project attendance consisted in one meeting between two project leaders and the quality department, and one meeting between the project leader and some competence coaches. During the visits to the project informal short talks were also held with various managers/key actors.

Another observation day consisted of rucksacking a competence coach for a day. The main activities during this day consisted in a meeting between eight of the nine competence coaches and the HR manager, informal talks with the followed coach, and attending a meeting between the coach and a project leader.

All tapes have been transcribed word by word. From the preparatory phase, and from all attended meetings and observation days, extensive notes were taken and typed out.

## Data analysis

From the above it follows that the empirical material is highly contextual, and emanates from people representing various levels, tasks and functions of the unit. This rich material offered an opportunity to reflect upon the issue of sustainability over time, in a rapidly changing environment. An important reason for this was that the strivings and the visions of the leader duo were obviously coherent with the efforts to define sustainability in line with work on the forthcoming anthology "Creating sustainable work systems: Emerging perspectives

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<sup>27</sup> Present were a HR-manager, a quality manager, a competence coach, a C.E.O. for a virtual product company, and a project leader and former C.E.O. for a virtual product company. Two women/three men, all of Swedish nationality.

and practices” (Docherty et al., forthcoming a). At the same time, our intuition and the reality reflected in our empirical case pointed to the necessity to problematise the concept in order to host requirements dealing with high complexity and contradictory demands – possibly contributing to a critical reflection on empirical ground of the sustainability concept. Data were therefore employed for a secondary analysis in order to discuss the meanings and possibilities of the concept of sustainability.

Data analysis has been a joint effort after the collection period with recurrent meetings between the two authors/researchers, discussing and interpreting the change process in the light of the interviews and other collected information. Processes concerning four different aspects of the ongoing business were identified and related to sustainability – in products, in organisation structure, in principles related to how work is organised, and for individuals. Where nothing else is said the quotations in this report come from interviews with the key actors.

## Appendix 2: Direction giving concepts for the innovative organisational change (creating and maintaining new culture)

Below follows a list of 13 points that were extracted from introductory talks and meetings with key actors. The list was presented and discussed extensively at a meeting with key actors. The conclusion was that this can be seen as a list of direction giving concepts capturing the visions of innovative change.

### **Direction giving concepts:**

- learning takes place in work tasks
- added value for the individual
- profitability for the company
- responsibility for one's personal competence development
- broadening of identified task
- embracing the whole work chain
- teamwork and joint responsibility
- mobility
- non-hierarchical
- reciprocity
- production companies having access to competence just-in-time
- autonomous production companies
- clear and distinct feed-back