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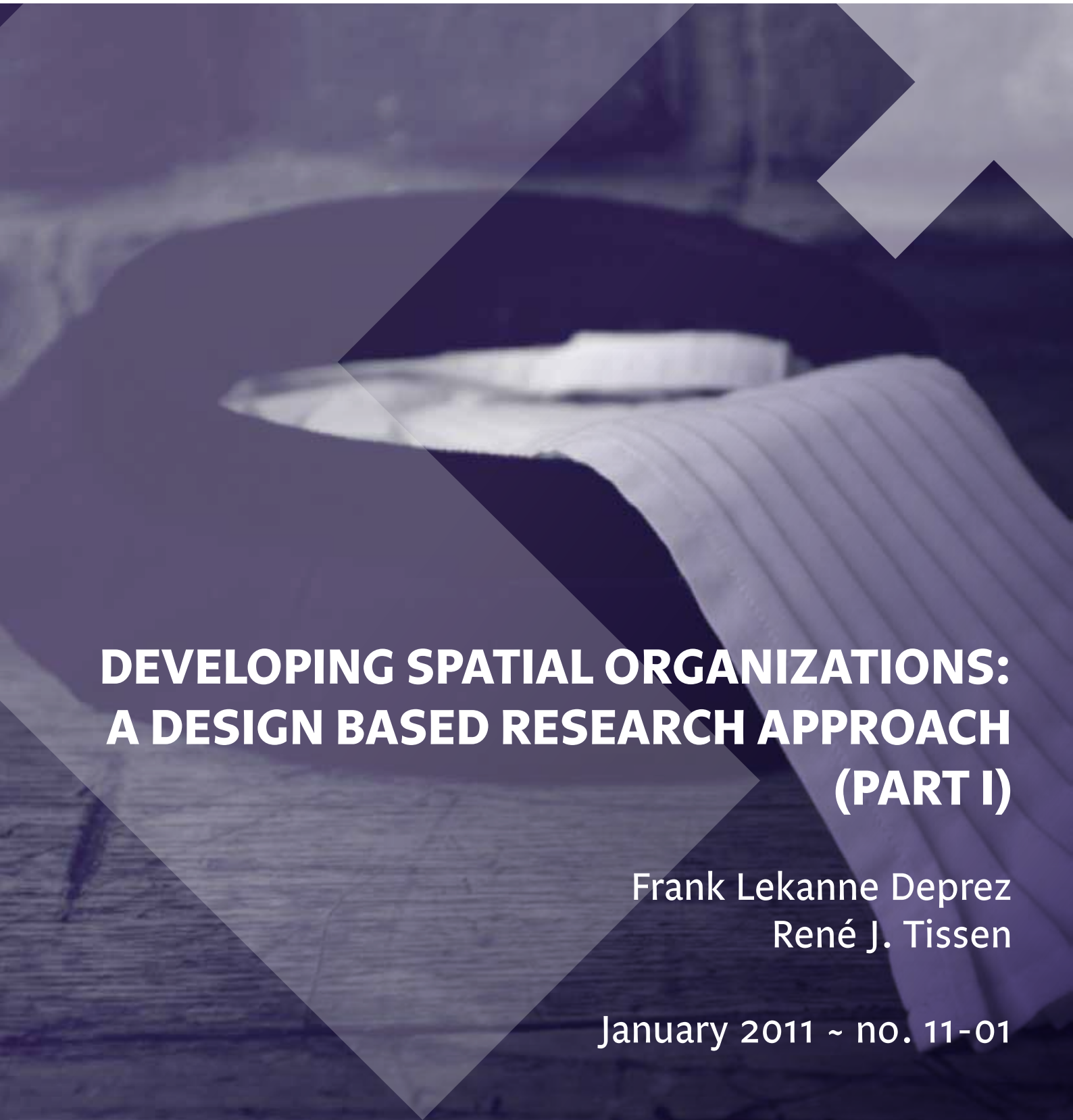

DEVELOPING SPATIAL ORGANIZATIONS: A DESIGN BASED RESEARCH APPROACH (PART I)

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Abstract
In this research paper[1] Spatial Organizational Theory is applied to the actual practice of organizations. A new way of organizational design is presented and tested, using design based research methodology. Three core organizational design steps (Dimensioning, Orientating and Formatting) are applied to Statistics Netherlands (CBS) and initial results are discussed.

Keywords
Organizational Design, Dark Side of Organizational Design, Spatial Organizations, Design Methodology.

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[1] In earlier papers the theoretical foundations and implications of Spatial Organization Theory were described and discussed, with a view on its relevance to exisiting organizations. See NRI-research papers nr 08-04/2008, nr 09-07/2009 and 09-09/2009. This paper is the first part in a series of two. Part II will be released in April 2011.

Introduction

Comparing organizations not only shows us how organizations are alike but also how they are different from each other (Aldrich, 2009). Researchers of organizational design and theory have long recognized that there are few universal truths when organizational performance is concerned. Starbuck (2007) states that during the 1960s and 1970s, a great variety of statistical research sought to identify the common properties that researchers assumed were shared by all kinds of organizations. This research basically demonstrated that the only properties shared by all organizations are ones that have no substantive importance. Whereas people create organizations to do things that are not already being done, aim to rise beyond the 'sea of sameness' and break free of the pack, the desire to find general properties forced researchers to ignore or de-emphasize those properties that enable organizations to do distinctive things, and thus to exist. After many studies over years, it became apparent that "the only generalizations that were surviving replication were commonplace ideas that required no documentation. For example, one of the main findings was that bigger organizations write more information on paper than smaller organizations do (Starbuck, 2007, p. 22)."

Along the way, our interpretation of the organizational world has become more open, incomplete and emergent. Although mechanistic interpretations of the (organizational) world in terms of mechanical linkages, their formal order and almost beautiful 'clockwork exactness' are still valid, organizational mechanisms become more interconnected and complicated "…the [organizational] worlds the mechanisms reveal are complex. They are open, evolving, and yield emergent properties that are not predictable from their parts. The view we are moving to is no longer one of pure order. It is one of wholeness, an organic wholeness, and imperfection (Arthur, 2009, p. 211 – 212)."

Increasingly we replace our image of perfection (e.g. blue – print maps of organizations) with an image of imperfect wholeness, and within that wholeness a *messy vitality* (Arthur, 2009). Order, closedness, and equilibrium as ways of organizing explanations are giving way to open-endedness, indeterminacy, and the emergence of perpetual novelty. Over the past 30 years, many influential management thinkers and gurus (e.g. Margreth Wheatley, Henry Mintzberg, Gareth Morgan, Arie de Geus, Tom Peters, Stan Davis, Jay Galbraith and William Starbuck) have largely come to accept – and to advocate - the idea that organizations are not machines; they are as unpredictable, unruly, self-organizing, and even responsive as any living beings. Just as organizations will have to

exist in less tangible, less prescribed forms, so will managerial thinking have to become less departmentalized, less silo – based and more open. The managerial mind set must make a fundamental shift beyond tweaking existing organizational forms and (re)mixes, to reinvent them into new 'creations'. This mind shift in thinking – dealing with messy vitality just to survive, let alone thrive - has a profound impact on the way organizations are and should be designed. All design work requires at least an assessment of the current organizational forms and their ability to deliver the required results. Dynamic organizational designs need to be adaptable, flexible, incomplete, fluid, vital, sustainable and agile, fit for meeting current and future demands.

We propose that spatial organizational designs will reshape and reform organizations in such a way that organizations can be characterized by unlocking latent value through the integration of knowledge, people and technology into (new) products, services & processes. The way organizations, acquire, access, share and exploit knowledge largely depends on how people and technology inside and outside an organization contribute to this process. Integrating knowledge by focusing on combining and exploiting the tools, methods, behavioral practices available within three separate spaces:

- physical space (office design, workspace)
- virtual space (communities, platforms, networks, social media) , and
- mental space (mindset, psychological contract).

Creating real value from knowledge is dependent on your knowledge strategy, the creation sharing and the productive use of knowledge. Most common organizational design efforts focuses on a strict division of labor (functional, divisional and matrix). Modern organizational design involves the integration of knowledge ((Frost, Osterloh & Weibel, 2010) and the use of 'spatial arrangements' in which work is no longer divided through the structuring of functions, tasks and activities, but brought together and connected in the best possible context for people to work in, more specifically to 'put their minds to'. Adopting a spatial design perspective does however imply a dynamic process leading to impermanent, incomplete outcomes, and iterative engagements with regard to desig*ning* (Garud, Jain & Teurtscher, 2008), organi*zing* (Pettigrew et al, 2003) and manag*ing* (Mintzberg, 2009) organizations that require momentary and constant improvement (Jelinek, Romme & Boland, 2008).

This paper (part I) describes how modern organizations can incorporate and exploit the notion of space within their organizational design efforts. Chapter 1 provides an overview of recent developments in the area of organizational design, which indicate the emergence of space as a design criterium. A short history of organizational design is provided in which three distinct ways of thinking about organizations are recognized to substantiate the notion that spatial organizational design is necessary when looking at the world economy as a knowledge-based effort requiring the minds of workers, instead of their hands. On the basis of this, different organizational forms are compared, their benefits and limitations compared and an overview is given of what is lesser known in organizational theory and practice, namely the 'darkside' of new organizational forms. In chapter 2, we focus on the adoption of space as a dominant design criterion embedded in a new paradigm towards performance through Spatial Organization Theory. As managers and employees create, maintain and dissolve boundaries (Tissen & Lekanne Deprez, 2008) – among other things – as a means of simplifying, ordering and capturing the (complex) environment, 'managerial mental fences' must be 'knocked down' to create mental space on how to improve and reinvent modern organizations. We will discuss the process of designing modern organizations. First of all, an overview of the current *models* of organizational design is provided. Hereby organizations are dominantly considered as systems which function as steady states with equilibrium, or are perceived as such. Apart from selecting a model, choosing the right *approach* for designing an organization is an important step. Because designing is a fundamental process and not a repair job, choosing the right approach is crucial for the way an organizational design can be developed and even implemented; 'The approach must match either the current organizational way of doing things or set the tone for doing things in the future (Stanford, 2007, p.25)'. Based on a model and a selected approach, new forms of organizations will emerge. Furthermore the criteria for determining what's so 'new' about organizational forms are presented and applied. .

In a global knowledge-based economic environment new – often web enabled – businesses evolve faster than the ability of managers, employees, consultants and researchers to develop new and more suitable organizational forms. For example, the industrial economy lasted 190 years (1760s to the 1950s) globally, and ninety years (the 1860s to the 1950s) in the United States. The most widely used model for organizing, managing and designing a company in the industrial age (i.e. Sloan's decentralised divisional structure) only came along until the twilight of the era (Davis & Davidson, 1991). What we can learn from the history of the industrial economy is that new

organizational models do not appear in practice until an economy is quite mature. Although still a somewhat fuzzy notion, the knowledge economy is generally accepted as a meaningful economic concept of the 21st Century, one worthwhile pursuing but not yet realized. This economy has yet to become a "proven successor to both the industrial and service – based economies." (Lekanne Deprez & Tissen, 2009, p.11).

Once an organizational design limit is reached, a redefinition of the 'entity' itself becomes necessary . But even when old models do not work any more or any longer, new ones have yet to evolve (e.g. Roberts, 2004; Miles, Miles & Snow, 2005; Getz, 2009; Lekanne Deprez & Tissen, 2009; Dyer & Ericksen, 2009; Frost, Osterloh, Weibel, 2010).

1. Towards Modern Organizations: Restructure or Redesign?

The interest in organizational (re-)design mainly stems from research showing that leveraging the power of an organizational form across all aspects can establish and sustain an organization's unique position and increase its performance and inherent vitality (O'Reilly III & Tushman, 2004; Joyce, 2005; Neilson & Pasternack, 2005; Burton et al, 2006; Bøllingtoft et al, 2009; Schreyögg & Sydow, 2010; Miles et al, 2010). The US Organization Design Forum[2] promotes for example the notion and need for conscious organizational design as being much more than 'just' changing the structure of organizations.

> "'*Managers need to redesign not simply restructure', which is why it is 'not a good idea to simply redraw the organization chart, put people in their new places and expect performance improvements." (Stanford, 2005, p.8)*

Particularly under the influence of 'breakthrough' economic and technological innovations, such as the advance of the Knowledge Based Economy (Powell & Snellman, 2004; Rooney, Hearn, Ninan, 2005; Amidon, Formica, Mercier-Laurant, 2005, Lekanne Deprez & Tissen, 2009) and the exponentially deepening impact of Information & Communication Technology in all aspects of the daily life and work of people (Castells, 2000; McAfee, 2006; Shirky, 2008; Powell, 2009, McAfee, 2009; Arthur, 2009; Brynjolfsson & Saunders, 2010), *effective* change and transformation is expected to come from efforts focused on organizational redesign, reshaping and restructuring

[2] (http://www.organizationdesign forum.org/)

(Fenton & Pettigrew, 2000; Pettigrew et al, 2003; Malone, 2004; Joyce, 2005; Neilson & Pasternack, 2005; Dunbar & Starbuck, 2006; Stanford, 2007; Jelinek, Romme & Boland, 2008; Garud, Jain & Teurtscher, 2008; Getz, 2009). The renewed interest in organizational (re-) design can in this respect be seen as one of the few theoretical and managerial domains not yet fully explored and reaped, but promising to lead to better organizational performance.

The overall aim of research into organizational (re-)design is generally to develop an accessible, robust body of knowledge that enhances the understanding of designing organizational configurations, processes, applications, methods and contexts to allow managers and employees to successfully create, transform and revitalize organizations for enduring performance. Organizational design is thus a broad and unfocused term that traditionally refers to the process of assessing and selecting the structure and formal system of power, communication, division of labour, coordination, control, authority and responsibility required to achieve an organization's goals (Galbraith, Downey & Kates, 2002).

Often, the knowledge resulting from organizational (re-)design helps to define good practices and workable methods in dealing with design and design related opportunities. By its very essence organizing is regarded to be an evolving, ephemeral and iterative process. '*Design is not for life or even for very long* (Stanford, 2005, p. 2)". On the one hand design feels messy and complicated but on the other hand the process of design is often treated as a simple extension of regular – day to day - managerial work and viewed as something "*we can all do if only we put in the time".*

At some point in time, management and/or employees inevitably reach the conclusion that the way their organizations are designed stands in the way of their further growth and success. This is a phenomenon underlying the more or less constant sense of (re-)assurance managers and employees seek as to whether 'their' organizations are properly and sustainable designed and actually do '*what they were designed to do* (Gellerman, 1990, p. 68)'.

However, managers generally find it difficult to recognize that organizational design alternatives which solely or predominantly fit into their existing mindset often result in a *"failure of imagination and a tendency to reproduce the past* (Collopy, Boland & VanPatter, 2005, p. 7)*"*. Bate, Kahn, and Pye (2000, p. 200) pinpoint this process as the *paradox* of organizational design:

> *"…on the one hand design creates nothing. By itself, design is an empty vessel wanting to be filled with people, meanings and actions…it is a dead form that has no life or energy itself…. Yet on the other hand, it creates*

everything since organizational design will have a fundamental framing effect on people's expectations and perceptions, setting the context for the organizing activity – the social construction of roles and relationships – through which structure is enacted."

For organization design to have a scientific bases, research must develop concepts and propositions that suggests design options. Organization design research must compare the efficacy of organizational structures and developmental processes, and organizational designers must create methods for implementing effective structures and processes (Dunbar & Starbuck, 2006).

Siggelkow and Rivkin (2005, p. 102) claim that:

> *"While recognizing the profound effects of turbulence and complexity, we argue that formal organizational design still deserves scholarly attention, even among students of new organizational forms. Whether or not an organization is labelled virtual, learning, modular, cellular, network or even spaghetti (Gould, 1999), it continuous to face questions of formal design. Its managers must still allocate tasks and decision rights, provide incentives, and structure communications."*

An organizational form provides a more or less stable and transparent regularity that makes "organizations independent of specific individuals and means that they are more than the sum of their individuals (Bolin & Härenstam, 2008, p. 545)". Of course this kind of design thinking makes comparison of a sample of organizations possible. Although organizational design has been a central topic in management courses of modern business schools, modern day concern for this topic is *more symbolic than real*. Dunbar and Starbuck (2006, p. 171) state that:

> *"Most accepted academic theories of organizational structure and design rely on research conducted in the 1950s, 1960s, and 1970s by Woodward, Perrow, Lawrence and Lorsch, and Galbraith. Since that time, new kinds of organizations have grown prevalent, shifting the options for organization designs to different organizational properties. In particular, information and communication technologies have revolutionized the ways organizations operate, globalization has changed organizational identities, workers' educational levels and quality-of-life expectations have continued to rise rapidly, and knowledge – based activities have become central to working life."*

According to the literature on new forms of organizing, modern companies are in need of a reinvention of the traditional command and control systems and of more experimentation with

intrinsically flexible, dynamic, post-bureaucratic, responsive and even agile organizational forms that support and encourage innovation, learning, creativity and value exploitation, all in order to cope successfully with turbulent market conditions (Frost, Osterlich & Weibel, 2010; Schreyögg & Sydow, 2010; Worley & Lawler III, 2010). One of the most displayed and common 'habits' of managers in this regard involve the 'rehashing' of familiar organizational forms and structures into so-called 'new' forms. Despite their variance in shapes and forms, the concept of 'new organizational forms' is often used as if it has a commonly understood meaning (Palmer, Benveniste, Dunford, 2007), notwithstanding a cacophony of – more or less - appealing terms and metaphors. These 'new forms' sometimes create the impression that the more exotic they are named, the more 'avantgardistic' management is. Practice however often shows the theoretical nature of new organizational forms. Due to a lack of empirical studies, more is known about how organizations should be designed than what they are actually like – right here, right now.

Very few organizations have truly embraced these 'new' concepts (Getz, 2009; Frost, Osterloh & Weibel, 2010). Many of the studied companies in the 1990s and early 2000, from Google to Toyota, achieved worldclass performance: "Yet the adoption of such organizational forms remains low (Getz, 2009, p. 34)." Of particular importance is the overall disagreement in literature about the compatibility of 'old' and 'new' organizational practices. For example, Bolin & Härenstam (2008) conducted an empirical study of bureaucratic and post- bureaucratic characteristics in 90 workplaces and concluded that "the structure of most workplaces was characterised by *both* post-bureaucratic and bureaucratic features (Bolin & Härenstam,2008, p.559, *italics added*)." Originally, researchers assumed that 'old' practices, such as centralization and formalization, were discordant with a more dynamic workplace. 'New' organizational practices, such as flexible work groups, delayering and collaborative networks, would replace 'old' practices after a period of transition. For example, Leavitt (2005), argues that although organizations do tend to abandon, or have already abandoned old, multitiered, top-down designs - in favour of new networks, communities, federalized systems, internal marker structures, and other, more egalitarian forms - they essentially *remain as hierarchical* as was common in the industrial age. Hierarchies are in fact not replaced, Leavitt states, multilevel, pyramid shaped structures remain solidly in place. '*Many are being remodelled, perhaps, but their basic hierarchical structure has not gone away (Leavitt, 2005, p.X). '*Researchers have argued that "*instead of replacing 'old' with 'new', the two are compatible and can co-exist* (Dunford et al, 2007, p. 25)." Dunford et al conclude their article with a challenging statement: "*maybe what is 'novel' about 'new' practices is not the 'new' practices themselves, but the way they interact with traditional organizational practices* (Dunford et al, 2007, p. 39)."

1.1 A Short History of Organizational Design

A theory of organizational design must explain both the elements of organizational designs and the forces that motivate the search for new configurations of those elements (Miles et al , 2010). Traditional organizational design processes generally make it easy for managers to choose from a menu of structural elements, all of which are well researched and presented in business schools, but hardly valuable in today's world (Dunbar, Romme & Starbuck, 2008). Recently, Fenton & Pettigrew (2000), DiMaggio (2001), Pettigrew et al (2003), Stanford (2007), Anand & Daft (2007), Miles et al (2010) and Frost, Osterloh & Weibel (2010) have presented their theoretical and practical perspectives on organizational design. For example, Anand & Daft (2007) have categorized the history of organizational design into three eras:

- Era 1: Self – contained organization designs (Mid-1800s – late 1970s)
- Era 2: Horizontal organizational design with team and process - based emphasis (1980s)
- Era 3: Organizational boundaries open up (mid-1990s)

Each era reflects considerable transformations in the managerial mindset on how to design (and manage) organizations. The *first* era probably took hold in the mid-1800s, and was dominant until the late 1970s. In Era 1, the ideal organization was self-contained. It had clear boundaries between itself and suppliers, customers or competitors. Inputs arrived at the organization's gate, and after a transformation process, left as a completed product or service. Almost everything that was required during the transformation process was supplied internally. The overall structure of self-contained organizations can be thought of as:

- the grouping of people into functions or departments;
- the reporting relationships among people and departments;
- the systems to ensure coordination and integration of activities both horizontally and vertically.

The common structures of this era, including functional, division, and matrix designs, rely largely on the vertical hierarchy and chain of command to define departmental groupings and reporting relationships (Anand & Daft, 2007).

The *second* era of organizational design started in the 1980s. As the world grew increasingly complex, organizations of Era 2 experienced the limits of traditional designs. Coordination between departmental 'silos' became more difficult and vertical authority-based reporting systems often were not effective in creating value for customers. At the same time, the information

processing capacity of organizations improved greatly, due to the increasing availability of personal computers and networks. Design philosophies of this era emphasize the need to reshape the internal boundaries of the organization in order to improve coordination and communication. The horizontal organization (Ostroff, 1999) emphasizes reengineering along workflow processes that link organizational capabilities to customers and suppliers. While traditional self contained organizations of Era 1 embodied the need for hierarchical control and separate functional specializations, the horizontal organization advocated the dispensing of internal boundaries that are an impediment to effective business performance. If the traditional structure can be likened to a pyramid, the metaphor that best applies to the horizontal organization is a pizza – flat, but packed with all the necessary ingredients (Anand & Daft, 2007).

The *third era* of organizational design covers the mid-1990s, in which rapid improvements in communication technology (Internet, mobile phones) proliferated into organizations, to fundamentally change traditional ways of working (Anand & Daft, 2007). Era 3 also coincides with the rise of emerging economies such as China and India, where there is a great pooled of skilled expertise in performing very specific tasks such as low-cost manufacturing and software development. The external and internal boundaries of the organization opened up as never before. Managers became increasingly comfortable with the idea that their organization could not efficiently perform all of the tasks required to make a product or service. In the early years of the era, large and bloated organizations shed a lot of tasks that were completed internally, and this led to a difficult period of adjustment. Later on, start-up organizations were designed at the outset to be more lightweight by having a number of tasks performed externally (Anand & Daft, 2007).

Few of today's companies can 'go it alone' under a constant influx of international competitors, changing technology, and new regulations. The biggest trend in the design of organizations in Era 3 has been, without doubt, the outsourcing of various pieces of work done internally to outside partners. Anand & Daft (2007 pp. 334 - 340) have selected three organizational designs that are representative of this era: the hollow organization, the virtual organization and the modular organization. The movement from Era 1 to Era 3 has vastly expanded the array of organization design choices nowadays available to managers.

Often managers are in the dark about their organizational structure and/or model. Sometimes there's a gut feeling that their organization has too many layers of management. But the bottom line is that management often isn't able to come up with the *right* number of layers needed to

create excellent performance. Confronted with a dizzying array of options to choose from, mastering the art of comparing organizational structures and advantages and limitations of these structures has become an important competence. Stanford (2007) has compared five well-known organizational structures (see figure 1) to other organizational elements (e.g. division of labour, politics etc). Furthermore Stanford (2007) has summarised the advantages and limitations of various structures (see figure 2).

	Functional	**Divisional**	**Matrix**	**Network**	**Cluster**
Division of labour	By inputs	By outputs	By inputs and outputs	By knowledge	By skills and knowledge
Co-ordination mechanisms	Hierarchical, supervision, plans and procedures	Division general manager and corporate staff	Dual reporting relationships	Cross - functional teams	Centralised hub co-ordinating across partner organizations
Decision rights	Highly centralised	Separation of strategy and execution	Shared	Highly decentralised	Within each contributing organization
Boundaries	Core/periphery	Internal/external markets	Multiple interfaces	Porous and changing	Multiple changing interfaces
Importance of informal structure	Low	Modest	Considerable	High	High (hub to partner organizations)
Politics	Interfunctional	Corporate division and interdivisional	Along matrix dimensions	Shifting coalitions	Depends on contact between members
Basis of authority	Positional and functional expertise	General management responsibility and resources	Negotiating skills and resources	Knowledge and resources	Expertise resources, position in marketplace
Resource efficiency	Excellent	Poor	Moderate	Good	Excellent
Time efficiency	Poor	Good	Moderate	Excellent	Excellent
Responsive-ness	Poor	Moderate	Good	Excellent	Excellent
Adaptability	Poor	Good	Moderate	Good	Good
Accountabi-lity	Good	Excellent	Poor	Moderate	Good
Environment for which best suited	Stable	Heterogeneous	Complex with multiple demands	Volatile	Fast-paced
Strategy for	Focused/low	Diversified	Responsive	Innovative	Competitive

which best suited	cost				

Figure 1: Comparing Organizational Structures (Stanford, 2007, p. 66)

Structure	*Advantages*	*Limitations*
Divisional/ product	Product focus Multiple products for separate customers Short product development and life cycle Minimum efficient scale for functions or outsourcing	High cost, loss of economies of scale Difficulty of co-ordinating geographic areas Lack responsiveness to local conditions New product development falls between the gaps
Divisional/ geographic	Low value-to-cost transport ratio Service delivery on site Closeness to customer for delivery or support Perception of the organization as local	Conflict between regions and HQ Implementing new product lines or changes slow and difficult Difficult to apply global strategy Difficult to develop consistency and transfer learning
Divisional/market	Important market segments Product or service unique to segment Buyer strength Customer knowledge advantage Rapid customer service and product cycles Minimum efficient scale in functions or outsourcing Geographic market segments needed	High costs, loss of economies of scale Difficulty in co-ordinating geographical areas Less functional specialisation May lack responsiveness to local conditions
Divisional/process	Best seen as an alternative to the functional structure Potential for new processes and a radical change to processes Reduced working capital Need for reducing process cycle times	Challenge to implement: need to redefine the operating culture of the business Clashes occur between HQ and divisions Increased likelihood of process overlap and duplication
Matrix	Flexible: teams may dissolve after task completion Specialist skills brought to bear where needed Attention paid to product /geography	Difficult to apply Supervisor power struggles and overlapping responsibilities Need for a lot of co-ordination Greater transaction costs
Network	Quick response to markets High autonomy, ownership and accountability	Lack of deep functional expertise Difficulty with co-ordination between groups

	Less duplication of resources	Accountability needs to be carefully thought through and made clear
Cluster	Partners focused on particular aspects of the value chain leading to: • greater economies of scale • superior skills developed • reduced redundancy of operations • lowering of barriers to entry • ability to create "a series of short term advantages"	Clear central direction required Selection of capable partners is an issue Keeping partners synchronised is problematic
Virtual	Enables enterprises or individuals to organize and collaborate around an endeavour or project (often in real time over the internet) sharing ideas and information without being bound by any kind of formal organization, royalty fees or legal risk	May clash with intellectual property rights Could enable competitors seize advantage

Figure 2: Advantages and Limitations of Organizational Structures (Stanford, 2007, pp. 67 – 68)

All the organizational 'structures' discussed in figure 1 – functional, divisional, matrix, network and cluster – have particular advantages and limitations (figure 2). Conclusion: there is no all – purpose organization design. As new organizational forms (DiMaggio, 2001, Pettigrew et al, 2003, Stanford 2007, Miles et al, 2010; Frost, Osterloh & Weibel 2010) are emerging, one common 'element' is clear: a 'strict' division of labor - found in organizational structures like functional, divisional or matrix – is no longer the starting point for designing jobs within modern - knowledge based - organizations:

> *"….Integration of knowledge is crucial, and managers need to be aware of, and able to operate, newer organizational designs….* (Frost, Osterloh & Weibel, 2010, p.126)."

In every organization, there are really two organizations at work: the formal and informal (Katzenbach & Khan, 2010). The formal organization is the default 'governing' design structure of most organizations (functional, divisional etc..). The informal 'shadow' organization is an agglomeration of all human aspects and non – institutionalised aspects of the organization such as culture, values, gossip, myths and 'uncharted' connections (i.e. networks, communities, social

media). Metaphorically speaking, the new organizational design starts with the *lines* between the boxes of the formal organization chart. In spatial organizational design determining the meaning and connectivity of the lines is focused on organizing the knowledge stocks and flows within and between various organizational constitutions (individuals, groups, teams, networks, communities, organizations) and identifying the requirements of knowledge integration and then consider the content of 'boxes' of an organizational chart (Frost, Osterloh & Weibel, 2010):

> *"Although they [new organizational forms] differ in various aspects, one common feature is evident: They emphasize collaboration and voluntary knowledge transfer across functional, divisional, and increasingly, firm boundaries* …. (Frost, Osterloh & Weibel, 2010, p.131) .

Spatial organizations create openness as well as direction in the minds of people to organize, share and exploit content (e.g. concepts, ideas) and thus turn knowledge into value. In other words, organizational spaces can be identified and used to connect (static) *knowledge* to (dynamic) *thinking*, in such a way that workers can add better value 'simply' because the nature of knowledge fits - maybe even 'naturally' fits - their mental way of doing. Such spaces can be organized by means of '*spatial arrangements'* in which work is no longer divided through the *structuring of functions, tasks and activities*, but brought together and connected in the best possible context for people to work in, more specifically to 'put their minds to'. We have developed a spatial design approach that enables an organization to exploit the value of the current and future knowledge stocks and flows by identifying three steps of the process towards the design of spatial arrangements: Dimensioning, Orientating and Formatting. In chapter two these three steps will be discussed in detail.

1.2 Flawed by Design: The Dark Side of Organizations

Organization design is the outcome of shaping and aligning the constituent components of an organization towards the achievement of an agreed mission (Stanford, 2007) created by individuals to realize the joint pursuit of (mutually agreed) goals. Such an outcome implies that certain 'designed-in qualities exist that keep an organization adaptable to its operating context (Stanford, 2007, p.4)'. The dominant style of design thinking within traditional organizations, that are often designed around ongoing tasks and permanent assignments, is generally based on the use of two kinds of logic:

- The first, *inductive logic*, entails proving through observation that something actually works.

- The second, *deductive logic*, involves proving – through reasoning from principles – that something must be.

Any other form of reasoning or arguing outside these two is normally *discouraged* and sometimes even exterminated. The challenge is always, 'Can you prove that?' And to prove something in a reliable fashion means using rigorous inductive or deductive logic. Traditional organizational designers often use - and value - inductive and deductive reasoning. They induce patterns through the close study of organizations & people and deduce answers through the application of organizational design theories. However, modern organizational designers increasingly highly a third type of logic: *abductive reasoning* (Martin 2004). Abductive reasoning embraces the logic of *what might be*.

The origin of abductive logic

"Charles Sanders Peirce, a nineteenth – century American pragmatist philosopher like William James and Ralph Waldo Emerson, was fascinated by the origins of new ideas and came to believe that they did not emerge from the conventional forms of declarative logic. In fact, he argued that *no new idea* could be proved deductively or inductively using past data. Moreover, if new ideas were not the product of two accepted forms of logic, he reasoned, there must be a third fundamental logical mode. New ideas *come into being*, Peirce posited, by way of 'logical leaps of the mind'. New ideas arise when a thinker observes data (or even a single data point) that doesn't fit with the existing model or models. The thinker seeks to make sense of the observation by making what Peirce calls an 'inference to the best explanation'. The true first step of reasoning, he concluded, was not observation but *wondering*. Peirce named his form of reasoning *abductive logic*. It is not declarative reasoning; its goal is not to declare a conclusion to be true of false. It is modal reasoning; *its goal is to posit what could possible be true*. Whether they realize it or not, designers live in Peirce's world of abduction; they actively look for new data points, challenge accepted explanantions, and infer possible new worlds (Martin, 2009, pp 64 – 65, *italics added*)."

Design thinking and doing implies that in trying to create an organizational form, it's critical to have empathy for who's going to be working in the organization and not just focus on what the organization must do. *Design doing* is all about the iterative process of imagining, developing, testing, evaluating and evolving. Designers exhibit the ability to see all of the

salient – and sometimes contradictory – aspects of a confounding problem and create novel solutions that go beyond and dramatically improve on existing alternatives (Brown, 2008).

> *"Whereas traditional firms organize around ongoing tasks and permanent assignments, in design shops work flows around projects with defined terms. The source of status in traditional firms is 'managing big budgets and large staffs', but in design shops, it derives from building a track record of finding solutions to 'wicked problems' – solving tough mysteries with elegant solutions. Whereas the style of work in traditional firms involves defined roles and seeking the perfect answer, design firms feature extensive collaboration, 'charettes' (focused brainstorming sessions), and constant dialogue with clients. When it comes to innovation, business has much to learn from design. The philosophy in design shops is, 'try it, prototype it, and improve it'. Designers learn by doing. The style of thinking in traditional firms is largely inductive – proving that something actually operates – and deductive – proving that something must be. Design shops add abductive reasoning to the fray – which involves suggesting that something may be, and reaching out to explore it. Designers may not be able to prove that something is or must be, but they nevertheless reason that it may be, and this style of thinking is critical to the creative process. Whereas the dominant attitude in traditional firms is to see constraints as the enemy and budgets as the drivers of decisions, in design firms, the mindset is nothing can't be done for sure', and constraints only increase the excitement level* (Martin, 2004)."

This kind of abductive reasoning can scare the hell out of a lot of business people*." For a middle manager forced to deal with 'flighty, exuberant and creative types who seem to regard prevailing wisdom as a mere trifle and deadlines as an inconvenience, the admonition to 'be like a designer' is tantamount to saying 'be less productive, less efficient, more subversive, and more flaky' – not an attractive proposition"* (Martin, 2009, p. 65). But the prescription is *not* to embrace abduction to the exclusion of deduction and induction. Rather, it is to strive for balance. Imbalanced design thinking often creates ineffective and inefficient organizational designs. The inability to weigh the balance between abduction and deduction & induction produces organizations that are considered 'flawed by design' (Zegart, 1999). In his book on design flaws Zegart (1999) challenges the conventional belief that national security agencies work reasonably well to serve the national interest as they were *designed* to do so. Using a new institutionalist approach, Zegart asks what forces shaped the initial design of the Central Intelligence Agency, the Joint Chiefs of Staff, and the National Security Council in ways that meant *they were handicapped from birth*. A flawed organizational design may be the correct diagnosis. The sufferings of a flawed organizational design are obvious. Some organizations that were created even become tyrants:

"Divisions, departments, business units, operating companies, national sales units have been created. All have had their uses. All were developed to make our companies more competitive, more streamlined, more rational, more profitable. But now the organizations we created have become tyrants. They have taken control, holding us fettered, creating barriers that hinder rather than help our businesses. The lines that we drew on our neat organizational diagrams have turned into walls that no one can scale or penetrate or even peer over (Lekanne Deprez & Tissen, 2002, p.1)."

Obviously designing organizations can be wrong as well as go wrong.

Design can *be* wrong and *go* wrong.

Flawed organizational design efforts fall into three categories:

- *Poor design*. Too often, redesign involves little more than 'rearranging the deck chairs on the Titanic' (Mercer Delta, 2003b, p.5). The result is an organization that looks different on paper but performs much as it did before because none of the underlying problems have been addressed (Mercer Delta, 2003, p.2).

- *Poor execution*. In other cases, a strategically sound redesign can be implemented so ineptly that the organization actually loses value. In the midst of chaotic change, collective paralysis sets in; agile competitors move quickly to neglected customers and seize poorly served markets, and the organization quickly loses ground it may never be able to recap (Mercer Delta, 2003).

- *Over design*. 'Design is usually portrayed as forethought that leads to an intention. But on closer inspection, design may be less original than it looks. One reason is because beginnings and endings are rare, middles are common. People, whether designers or clients, are always in the middle of something, which means designing is as much about redesign, interruption, resumption, continuity, and recontextualizing, as it is about design, creation, invention and initiation (Weick, 2004, p. 74)."

For example, one of the latest 'new' organizational forms "The Network Organization" (Lifschitz, 2003; Kleindorfer & Wind, 2009)"– include a number of 'designed - in flaws'. Conventional wisdom rests on the false assumption that the *more employees collaborate, the better off*

the company will be. In fact, collaboration can just as easily *undermine* performance. Companies often fail to account for the associated costs of collaboration, conflicts between groups, teams, communities (e.g. 'tribal warfare), competing individual objectives and damaged customer relationships caused by conflicting messages from different parts of the company (Hansen, 2009; Hansen, 2009b).

Preventing hazardous design flaws caused by an organizational design that has simply outlived its usefulness requires a style of thinking - design thinking & 'design doing' - characterised by keeping organizations as being in a fluid state instead of being in a crystallized condition, being fixed. Modern organizations are fluid, incomplete (Alexander, 2002; Garud, Jain & Tuertscher, 2008; Tissen & Lekanne Deprez, 2008), living (de Geus,1997), agile (Dyer & Ericksen, 2009) and unfinished (Alexander, 2002b). Jelinek, Romme & Boland (2008) believe that implementing a successful design of organizations is *"necessarily messy, dynamic, iterative and responsive to circumstances, so any particular organizational arrangement is temporary, to be redone sooner or later as the undesired effects of our efforts are revealed, new needs arise, or better methods emerge* (Jelinek, Romme & Boland, 2008, pp. 321 - 322)".

In this paper the research approach underlying the practical application of spatial organizational theory is design based research – DBR - (Dialog, 2006) This approach focuses on what does not yet exist, though of course it will draw on hindsight ideas – derived from explanatory research - when applicable. DBR describes the context in which an intervention ('problem' or 'challenge') occurs. Design is about the process of making or doing something new. With both the problem and the context. As we will discuss in an accompanied paper (part II, to be published in 2011), design based research focuses on systematically improving the solution concept and on issues that are both academically interesting and resonate with practice. Rather than developing detailed recipes for supposedly permanent solutions, effective design points to a handful of (simple) rules and key processes, easy to vary and reconfigure. When organizing becomes increasingly complicated and dynamic, organization design should become simpler and easier to modify (Jelinek, Romme & Boland, 2008). According to Frank Nuovo, one of the world's best-known industrial designers, "*design in its simplist form is the activity of creating solutions. Design is something that everyone does every day (Pink, 2005, p. 75)".*

Design thinking thus implies modesty and humility as well as hope for the future. The strength of the design based research approach is its explicit focus on improving practice by turning design thinking into design doing. Designing 'far from practice' can be dangerous. Designs

without the strength to realize them are quite futile (Jelinek, Romme & Boland, 2008). In the next chapter, we focus on how to put our design thinking on organizations into a practical *process* of designing by making it explicit through a three – step approach to designing spatial organizations.

2. The Process of Designing Modern Organizations

Introduction

The adoption of space as a design criterion, based on the emergence of a *spatial organization theory* (Tissen & Lekanne Deprez, 2008) originates from the continuous need for modern organizations to go beyond Era 3 (Anand & Daft, 2007) , i.e. to explore better ways to perform 'in the best possible way' both *within* as well as *beyond* existing boundaries and limits, whether perceived or real and whether structural or incidental. Designers often face conflicting standards of excellence. Practizing the art of organizational design can have both a forward and a reverse effect on the attitudes and behaviors of individuals, teams, organizations and nations. Here, the dominant mindset by which an organization is designed and managed is regarded as a design *challenge* in order to "keeping things *liquid* as long as possible (Collopy, Boland & VanPatter, 2005, p. 5, italics added)". Garud, Jain & Tuertscher (2008) even view design :

> "*... as continually evolving and essentially incomplete. Within such an approach, boundaries between designers and users become blurred, heterogeneous user preferences emerge in use, tasks remain partially partitioned and the goals of the design emerge through interaction. Such an approach to design acknowledges the partial nature of knowledge possessed by any one individual and focuses on the means by which distributed knowledge can be harnessed. In summary, while the scientific approach views incompleteness as a threat, a pragmatic approach harnesses its value. Eventually, a pragmatic approach involves the fusing together of two meanings of design – that is, as both process and as outcome. Any outcome is but an intermediate step in an ongoing journey, representing both the completion of a process as well as its beginning. Whereas the scientific approach emphasizes the need to crystallize designs, the pragmatic approach highlights the value of retaining fluidity* (Garud, Jain & Tuertscher, 2008, p. 367)."

A degree of 'solidification' of a newly designed organization - by means of its form - is at some point in time required. In designing such an organization, the designer probably won't have the luxury of beginning within a 'green field' situation. Organizations are often 'too big' to design all at once.

2.1 Models, Approaches & Forms

As we have discussed in chapter 1, the components of an organization can be considered as 'designed – in qualities' that keep the organization adaptable to its context (Stanford, 2007). The starting point is that here is no one-size-fits-all design solution for organizations. On the contrary, may designers often opt for a one-size-fits-*nobody* solution. However some general rules of thumb (design rules) are emerging. Organizational design rules are principles that define how an organization works, what it does and how it is built. These design rules allocate functions to components, identify operating principles central to each component, and set interfaces among components. Organization structure is often used synonymously - and incorrectly - to mean 'organization design' (Galbraith, Downey & Kates, 2002). So a restructuring or reorganization that focuses - almost solely - on the structural aspects is *not* organization design (Stanford, 2007). As we have discussed in paragraph 1.2, poor design of organizations result in poor outcomes and results. Designing is a fundamental process and not a repair job. One way to start such a design process is to consider an organization as a system. Stanford (2007) has summarized five *models* (McKinsey 7 – S Model, Gailbraith's Star Model, Weissbord Six Box model, Nadler & Tushman Congruence model and Burke-Litwin Model: see Stanford, 2007, p. 22) that serve as a framework to envision the organization in a holistic way. Although these models have been tested over at least two decades, each one was developed in an era of relative stability when organizations tended to have a single overarching design. Today's and tomorrow's world is different. So the models, even if updated, pertain to an Industrial Economy (and even early Service Economy). Even today factory – based organizational models are in use to essentially run borderless, wireless, web-enabled 21th Century Companies. The reason why managers give so much remedial attention to their organizations is that they are not 'in sync' with the needs and requirements of their 'members' and relevant stakeholders. These managers are not able to take advantage of the talent pool and collective intelligence within and outside of their organizations (Malone, Laubacher & Dellarocas, 2009). Modern design has to ensure that the organizational model managers select results in a form that is adaptive, fluid and incomplete enough to keep pace with the increasing speed, agility and complexity that characterizes 21th Century modern organizations.

Choosing the right elements and the right model for organizational design is one part of the design process. Another important step is to choose the right *approach* – the method for initiating and design work but also the way the design will be developed and implemented. The traditional process phases of assess, design, implement, embed and review is often accompanied by a widespread stakeholder approach using research methods like surveys, action research, focus groups and so on. Many approaches (e.g. World Café, Appreciative Inquiry, Storytelling, Brainwriting, Future Search, [for an overview see Stanford, 2007, pp. 25 - 30]) are available. The selection of a model and an approach (or approaches) is an intentional process because it forms a framework for future design.

In the past, countless organizational design efforts have failed (see paragraph 1.2) because they were undertaken for no clear reason; they were undertaken for the wrong reason (that is, wrong or invalid in most stakeholder's eyes); or they lost their connection with the original reason over time. Most *research studies* on organizational design assume that organizational designers understand well the design contexts and what design should achieve, rather than perceiving designs goals as in any way problematic:

> *"Thus, attention has focused on what components to include in designs and how to evaluate design performance. The assumption is that if a design includes the appropriate components, if the relationships between these components are logically consistent, and if they are congruent with organizational goals, then the design will perform well* (Dunbar & Starbuck, 2006, p. 174)."

Over time, organization design research has made progress by becoming more specific in identifying the components to be aligned, more detailed in identifying the criteria for evaluating 'fits', and broader in terms of range of rigorous research methodologies used to explore ideas about fit. As a consequence, discussions of organization design have grown more complex. Although lists of design components to be aligned and lists of evaluation criteria to check on alignment may appear to have practical value, these criteria 'for fit' say less than they appear to say.

> *"At best, they [lists of components and criteria] might help designers decide whether they have reached a stable end-state. However, they do not indicate whether this end-state is a good one, and they do not*

provide useful information about how to go about achieving a good end-state. (Dunbar & Starbuck, 2006, p. 175)."

Because designers do not have complete information when they begin, their activities must include exploration of multiple alternatives. The results of design efforts depend not only on relations among components, but also on the processes used to arrange components, the motivations of the people who are participating, and how all of these evolve over time.

Dunbar & Starbuck (2006) believe that designing must be iterative, that design efforts must be persistent, and that designing and taking actions are intimately bound up with one another. But in the process of designing organizations, designers nearly always misunderstood the goals and scope of the project. Therefore they should view their efforts as experiments that might not turn out to be predicted, and they should pay careful attention to the outcomes of these 'experiments'. Some outcomes accord with designers' expectations and others do not. As Brunsson (1982, p. 4) said: *"when an organization is specifically designed to deal efficiently with one set of objectives, tasks and situations, problems may easily arise when it has to handle other objectives, tasks and situations."* Designers and observers of design projects often have trouble extracting implications from unique cases, particularly as the bases that people usually use for generalizing – e.g. statistics – are abstent. Useful generalizations can emerge from describing the processes designers use to accurately map and take account of the uniqueness they deal with in specific cases. Conversely, some designers start with generalized theories and hypotheses that prevent them form seeing, assessing, and exploiting unique elements in their settings (Dunbar & Starbuck, 2006). Designing organizations is an ongoing, emergent process rather than a one – off experience. Therefore new forms of organizations often are incomplete and fluid.

Recently Palmer, Benveniste & Dunford (2007) identified *five areas* where different assumptions concerning new organizational forms are in use, underpinned by a variety of theoretical perspectives:

(1) *type* of change represented in transferring to new organizational forms

(2) *outcome* of changing to new organizational forms;

(3) *drivers* for changing to new organizational forms;

(4) *level of analysis* associated with discussing new organizational forms; and

(5) *meaning of new* in new organizational forms.

Therefore, labelling an organizational form as 'new' in the 21st century can be a good starting point, but it requires close investigation and creative research effort.

As John Roberts states:

> "…. organizational design involves both management and leadership. Beyond that, it is fundamentally a creative process. To succeed, a firm must create value and keep some of it. This can happen only if the firm's strategy and organization together allow the firm to be better than the competition, to offer products or services that meet its target customers' needs more effectively or more cheaply. A firm that does the same things in the same ways as the competition cannot be better than its rivals, and the head-to-head competition that will ensue will guarantee it gets to keep very little of any value it might create. …Clearly, much of this creativity can take the form of putting existing things together in novel ways…creativity involves originality, imagining new things, seeing new patterns and connections. Yet, as important as this originality is, it is not enough. *For the point is not just to come up with something new, but instead something distinctive that works.* For this, understanding of the fundamental logics governing organizational design is required (Roberts, 2004, pp. 286 – 287,*italics added*)."

Good organizational design requires a key capability, i.e. the ability to understand that each organizational design option is only one of a number of designs that exist in a multidimensional design space. Whereas certain organizational designs do fit and produce good results, while others do not, all organizational (re-)designs have one common denominator. They are all linked to 'people serving people' (Peters, 2010, p.412) . The shift from old to new organizational *forms* is increasingly supplemented by a shift from old to new organizational *design*, i.e. from what modern organizations should ideally look like, to how they can actually be construed. However, historically organizational models and their design principles have followed day to day business and operating needs and criteria. As we have discussed in chappter 1, the core organizational models of the industrial economy (e.g. the multidivisional form: Davis & Davidson, 1991; Roberts, 2004) did for example not emerge until relatively late in the industrial era (in the 1920s). The current arrival of innovative "new" ways of organizing can at this stage be seen as the early signs of a fundamental change in the (re)design of organizations, but their potential impact should not be overestimated. These 'new' models still need to reflect business and operating

needs of the current and future era. Many new forms are by themselves not yet clear enough for managerial practice to be 'embraced and implemented'. In normal organizational practice managers tend to take for granted that all design is relative to nothing: '*Mess up an organizational design and individual people*, *immensely flexible as people are, may still find ways to circumvent problems, avoid the formal difficulties and deliver performance anyway* (Yokoyama, 1992, p. 120).'

2.2 Designing, Organizing and Managing, Spatial Organizations

Normally organizations are not regarded as entities which can be designed for performance in a natural way, i.e. in which the right performance at the right moment in time is an outcome of flow instead of force. Management is commonly imposed upon organizations to *enforce* performance, while holding things together but at the same time cutting away certain extremes of dysfunctionality. As a result managers more or less take their organizations for what they are, because they find it too hard to improve on them by means of design. Within the area of managing, organizing and designing spatial organizations, our objective is reframe an organization less as 'structured', but more as 'arranged'. This is not just a question of semantics. It is about reframing an organization and turning it into something-distinctive – i.e. that-makes-a-difference. All organizations face the challenge of deciding from an infinite number of ways to combine their resources and activities to create and produce their services, products and processes in a distinctive way (Roberts, 2004). Instead of focusing on the importance of investing in and cultivating internal sources ("resource based view"), the context of organizations must not be overlooked. Professor Ranjay Gulati (Gilbert, 2010) of the Harvard Business School.

> "Most companies with an inside-out perspective become *attached to what they produce* and sell and to their own organizations (Gilbert, 2010, p.1).

The actual rise of spatial thinking in organizational design theory comes from a perceived - and thus yet to be proven - managerial paradigm shift which turns away from the resource-based ('placebound') view of the firm dominant in most organizations today, to the knowledge-based ('spacebound') view of organizations (Lekanne Deprez & Tissen, 2009). During recent years the latter arose from the potential for development and 'competitive' growth inherently associated with the knowledge-based economy. Whereas the dominant managerial paradigm derived from the resource-based view is '*to manage first and organize later*', the opposite is true in the knowledge-

based economy. In this view it is expected that *organizing (resources) better* will have a more profound effect on business performance and on improving it than *managing (resources) better*.

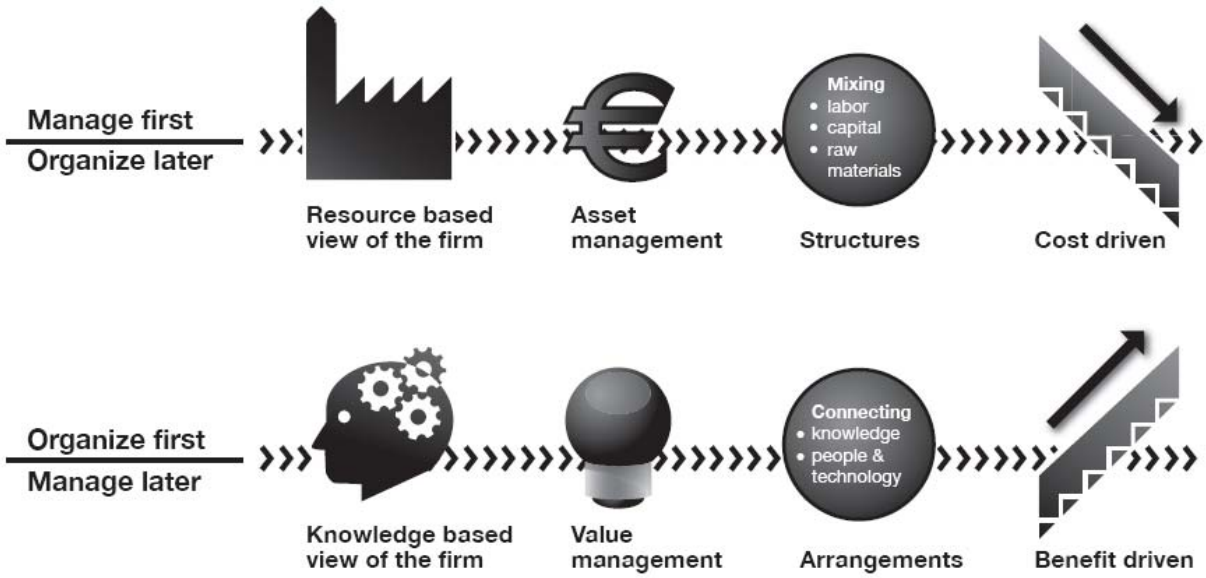

Figure 3: The Resource Based View of the Firm and the Knowledge Based View.

It must be noted that an actual paradigm shift has as yet not taken place and may not take place at all, mostly because of a lack of innovation in managerial thinking and action (Tissen & Lekanne Deprez, 2008; Birkinshaw, Hamel & Mol, 2008; Grant, 2008; Hamel, 2009; Birkinshaw & Goddard, 2009; Mintzberg, 2009; Birkinshaw, 2010). Whereas the future of management as a value-adding profession lies in the adoption of forward looking new ways of working, actual practice shows many management principles and practices to be 'founded on a hopelessly obsolete management paradigm' (Ghoshal 2005; Birkinshaw, Hamel & Mol, 2008; Birkinshaw, 2010). According to Hamel (2009), the evolution of management has traced a classic S- Curve:

> *"After a fast start in the early twentieth century, the pace of innovation gradually decelerated and in recent years has slowed to a crawl. Management, like the combustion engine, is a mature technology that must now be reinvented for the new age* (Hamel, 2009, p. 91)."

One of the promising areas to reinvent management so that it creates innovation that changes the complex world of work is organizational design. What needs to be *done* is to design organizations that are truly fit for 'now and the future'. This managerial challenge matches Birkinshaw's (2010) view on the management versus leadership debate:

> "Leadership is a process of social influence: it is concerned with the traits, styles, and behaviors of individuals that cause others to follow them. Management is the act of getting people together to accomplish desired goals. To make the distinction even starker, one might almost argue that leadership is *what you say and how to say it*, whereas management is *what you do and how you do it*. I don't want to fall into the trap of making one of these seem important at the expense of the other. I am simply arguing that management and leadership are complementary to each other (Birkinshaw, 2010, pp. 14 – 15)."

Our approach - i.e. designing spatial organizations - follows the management perspective of "*what you do and how you do it*". However, the dominant logic of the three step approach is far more *mental* then mechanical - i.e. based on vision and perspectives rather then applying standardized work methods, tools and processes. Instead of *managing* for traditional performance through the structuring of work – of things, tasks and activities to do or not to do - performance can be *organized* through 'arranging' the minds of people and by bringing those people together who share the same – or similar - mental models. This applies to another definition of management as a 'social endeavor' , which involves getting people to come together to achieve goals that they could not achieve on their own (Birkinshaw, 2010, p.10)".

Chia (1997, p.699) describes organizing as "an ongoing reality constituting and reality maintaining activity which enables us to act purposefully amidst a cacaphony of competing and attention-seeking inputs." *Reality constitution* refers to a set of activities through which managers secure their belief system within the very structure and working of the organization. For the new reality to settle, establishment of new rules does not suffice. They need to be enacted in daily practices (Dijksterhuis, van den Bosch & Volberda, 2003). *Reality maintaining activities* are managerial and organizational activities aimed at reinforcing a constructed reality. Organizational members either increasingly rely on a new belief system – or consistently revert to old beliefs, in which case cognitive change has failed (Dijksterhuis, van den Bosch, Volberda, 2003) and the new mindset is not embedded in the organization.

Perceiving an organization as "people serving people" (Peters, 2010), in our approach an organizational setting becomes an *arrangement of people's minds* putting knowledge flows to value. Organizing knowledge flows – which occur in any social, fluid environment where learning, collaboration and co- creation can take place – is becoming one of the primary means of value

creation (Hagel III, Brown, Davison, 2009; Nonaka, Toyama & Hirata, 2009; Miles et al, 2009). The knowledge an employee has is of no value unless it is shared, embedded and deployed within a process that creates and adds value to an organization. Traditional organizations have focused on building and protecting knowledge *stocks* – proprietary resources that no one could access unless you had a license or paid a substantial fee. Knowledge-based organizations focus on knowledge flows. The number and quality of knowledge *flows* of an organization will be one of the fundamental building blocks of the spatial organization. Anna Grandori (in Grandori and Kogut, 2002) observed that what *knowledge approaches* can contribute to organizational theory is "... a new '*contingency*' factor for understanding *organizational arrangements*... Knowledge complexity, differentiation, specialization, complementarity and interdependence are emerging as important contingencies affecting effective organization and governance solutions (Grandori & Kogut, 2002, p. 225, *italics added*)." Generally speaking, the organizational design literature can be viewed from either a contingency or multi-contingency perspective (Snow, Miles & Miles, 2005).

> *"Contingency theories tend to rely on a single dominant variable as the determinant of organizational structure and behavior, such as technology or the environment. Multi – contingency theories, on the other hand, are built upon clusters of variables, and these theories emphasize the need for alignment or fit among organizational components* (Snow, Miles & Miles, 2005, p. 4)."

The knowledge based view of the organization basically expands the limits of the resource based view, but does not (yet) break with it. Emphasis is given to the importance of how organizations identify, recognize and utilize knowledge to improve their strategic and operational position. Within this view:

- *people* utilize and exploit their mental capabilities ('mental space') to generate value.
- *technology* offers global access and connectivity to knowledge flows.
- *knowledge* is considered as the primary source from which value creation takes place.

This way of looking at organizations implies the ability of companies to deal with so-called VRIN resources e.g. resources that are Valuable, Rare, Inimitable and Non-substitutable (Stähle & Bounfour, 2008, p.165) - which themselves are often intangible and 'less to not' manageable. Baldwin (2007, p.9) asserts that such knowledge-based firms can be diverse, but have the following in common:

(1) an overall focus on what goes on *inside* a firm or organization ('inside - out' versus 'outside - in'), as a means to build - and benefit from - the inherent strength of organizations.

(2) a general agreement on the value (or "advantage") derived from 'things' that a firm can do, variously labelled as routines, competencies, or capabilities — that are *not easily imitated or purchased*

(3) a joint recognition that these routines, competencies or capabilities are *based on knowledge*, which is distributed across individuals and must and can be assembled and reconfigured in various ways.

The increasing awareness of knowledge as a valuable asset is generally referred to as a paradigm shift away from the resource-based view of the firm towards the *knowledge-based view* of the firm (Schendel, 1996, Grant, 1996). Together with a number of other authors (Kaplan et al, 2001; Krogh & Grand, 2002; Nonaka, Krogh & Voelpel, 2006; Kapoor & Lim, 2007) the knowledge-based view focuses on *knowledge* as a dominant *source* of competitive advantage (Grant, 1996; Foss, 1996; Foss, 1996b; Kaplan et al, 2001; Grandori, 2001; Spender, 2003; Nickerson & Zenger, 2004; Nonaka, von Krogh & Voelpel, 2006; Foss, 2006; Felin & Hesterly, 2007). During the last 15 years, economic and management research has focused on understanding and explaining why some organizations appear to earn profit or gain value of its knowledge base, competences and capabilities. Some firms are, in fact, more capable than others, and they are able to leverage their knowledge, competences and capabilities to gain value. This knowledge – based view on organizations (Lekanne Deprez & Tissen, 2009; Lekanne Deprez & Tissen, 2009b; Nonaka, Toyama & Hirata, 2009; Miles et al, 2009) makes it possible to view modern organizations as more than 'one- size-fits-all' singular structures, namely as portfolio's of spatial arrangements in which diverse but strong relationships exist between the arrangement itself and the (required) performance of people and organizations. Designing organizations from a knowledge based perspective will lead to the development of a new organizational form – i.e. a spatial organization – 'designed' to enhance knowledge sharing, knowledge - driven innovation and capable of generating economic and social wealth through spatial arrangements.

2.3 A Three Step Approach to Designing Spatial Organizations: Dimensioning, Orientating and Formatting (DOF)

Organizations are important 'actors' in society. In order to improve our understanding of the performance of organizations we must be aware of what characterizes (un)successful organizations: how do they emerge and are they doing what they are designed to do. Are companies better capable of achieving business performance through 'modern organizational shapes' than through conventionally structured and 'boundary-fixed'(Santos & Eisenhardt, 2005) or even 'bounded' (Hernes, 2004) organizational forms, such as the pyramid-shaped organizational structure?

Hanging on to old practice:

Managers who develop pyramids harvest mummies

Signs that traditional structures and existing management approaches have reached their limits continue to surface within both the academic and practice based studies (Pfeffer & Sutton, 2006; Brafman & Beckstrom, 2006; Palmer, Benveniste & Dunford, 2007; Getz, 2009; Frost, Osterloh &Weibel, 2010; Birkinshaw, 2010). So far, however, management of the twenty-first century appears not much different from management in the late twentieth century.

A New Managerial Revolution?

Gary Hamel: "In any field of human endeavor you ultimately reach a point where you can't solve the new problems using the old principles. I think we've reached that point in the evolution of management. When you go back to the principles upon which our modern companies are *built* – standardization, specialization, hierarchy, and so on – you realize that those are not bad principles *but they are inadequate for the challenges that lie ahead* (Barsh, 2008, p. 9 , *italics added*)".

For most of the 20th century, traditional design principles and - equally traditional - organizational forms worked well. Anand & Daft (2007) effectively indicated the performance progress made within the area of organizational design in both the 19th as well as 20th century. The current period of time – the 21st century - seems to be a period of a dramatic shift in the nature of social, economic and working life. New organizational forms can help to cope with new social and business realities. The lack of clarity regarding what characterizes 'modern organizations' has however slowed down the development of organizational research. Declining

interest in organizational design (Dunbar & Starbuck, 2006; Dunbar, Romme & Starbuck, 2008) and comparative organizational research (King, Felin & Whetten, 2009) has created space for new innovative approaches to organizational analysis. Some of the renewed interest in the practical development of critical organizational design principles (e.g. Roberts 2004; Neilson and Pasternack 2005; Bøllingtoft et al, 2009) can be traced back to the growing awareness of managers to (further) enhance organizational performance by more fully exploring, developing and exploiting internal potential and more aggressively pursuing new opportunities. In order to achieve the potential benefits of new approaches to organizational design (Lekanne Deprez & Tissen, 2009; Lekanne Deprez & Tissen, 2009b; Miles et al, 2009; Nonaka,Toyama & Hirata, 2009) organizing the knowledge stocks and flows within and between various organizational constitutions (individuals, groups, teams, networks, communities, organizations) is crucial. For example, valuing decentralised organizational forms above centralized ones creates organizational design approaches where there is no headquarter and no 'bosses' (Prahalad & Bhattacheryya, 2008). Within such organizations, loosely coupled and coordinated groups perform routine and complex work without 'institutional direction' (Shirky, 2008; Garud, Jain & Teurtscher, 2008; Getz, 2009) They create 'space' in the minds of people in organizations to organize, share and exploit content (e.g. concepts, ideas) and thus turn knowledge into value. The current Web 2.0 (social) network tools have the ability to support the emergence of these types of organizations and these tools have no inherent respect for organizational boundaries, bureaucracy, centralization and formalization and other products of 'traditional organizational structures – thinking'. These ICT - tools are likely to facilitate incomplete, self organizing and fluid organizational forms. People from inside and outside the organization will create interactions among each other: e.g. by collaborating, working - and thinking together.

Through the understanding of the 'mentalization' of work (Fisher & Fisher, 1998; Albrecht, 2003; van Aken, 2003; Davenport, 2005; Levinthal & Rerup, 2006; Amabile & Kramer, 2007; Lekanne Deprez & Tissen, 2009b) - i.e. the nature and way people employ their minds towards the best use of knowledge - distinct 'spaces' can be identified, organized and utilized aimed at enabling people to better focus their attention and concentration on what needs to be done better in a foreward looking manner.

"It is not our feet that move us along – it is our minds" (Ancient Chinese proverb, Naisbitt 2006)

In other words, organizational spaces can be identified and used to connect (static) *knowledge* to (dynamic) *thinking*, in such a way that workers can add better value 'simply' because the nature of

knowledge fits - maybe even 'naturally' fits - their mental way of doing. Such spaces can be organized by means of '*spatial arrangements'* in which work is no longer devided through the *structuring of functions, tasks and activities*, but brought together and connected in the best possible context for people to work in, more specifically to 'put their minds to'. Such arrangements can be defined as:

> *"intelligent combinations of like-minded people, shared knowledge and dedicated technology, brought to value by means of distinctly separate but connected organizational forms, which direct, guide, and support the focus, attention and concentration of knowledge workers towards the optimal use of their minds with regard to performance and performance improvement ('moments of value')".*

We have identified three steps of the process towards the design of spatial arrangements: Dimensioning, Orientating and Formatting

1. *Dimensioning* focuses on the question of how *knowledge* can be better applied and exploited in organizational design.
2. *Orientating* involves the deployment of *people* of their minds towards the best use of knowledge
3. *Formatting* directs people's attention on improving the productivity and quality of knowledge by imposing standardization and modularization on mental work activities as much as possible.

These three steps of spatial organizational design must be seen in relation to each other as a closed loop. Dimensioning leeds to orientating, orientating leads to formatting and back and forth. The process works as a *roadmap*, in which dimensioning results in a 'mental map' of the business landscape that works as a geography of space, the process of orientating as a *compass* for navigating through space and the process of formatting as a 'drivers manual' which adapts itself to different road conditions ('business environments'). This process of organizational design can still operate even when the original roadmap is incomplete.

The optimal performance of organizations is heavily impacted by its ability to continuously acquire and integrate relevant knowledge. In order for knowledge to be useful and valuable, it must be organized. Only then can the minds of people be captured and put to use. But how can we tell if knowledge is valid, trustworthy and valuable? The growing importance of knowledge as a key differentiator and the source for sustainable competitive advantage has encouraged managers and employees to pay greater attention to *knowledge strategies*. Most knowledge in

organizations is not explicit, but implicit residing in 'mental maps' within the heads of managers and employees. Knowledge strategies assume that knowledge is dynamic ('flow') rather than static ('stock'). Knowledge strategies are closely related to knowledge domains. A knowledge domain is a collection of knowledge (crucial, specific or basic need) that is considered as a key lever for delivering quality work that contributes to the realization of the organizational objectives. A knowledge strategy implies the use of knowledge processes to an *existing* or *new* knowledge domain in order to achieve strategic goals. There are about five generic knowledge strategies[3]:

1) *Leveraging Knowledge*: This strategy embarks from *existing* knowledge domains and focuses on transferring that knowledge throughout the organization. In terms of strategic goal contribution, the leveraging strategy is orientated towards achieving efficiency (e.g. internal transfer or reuse of existing knowledge) as well as reducing risks in operations.
2) *Expanding Knowledge*: This strategy proceeds from the *existing* knowledge domain of the organization and targets of the organization and initiates knowledge creation by drawing on existing data, information and knowledge. The emphasis is on increasing the scope and depth of knowledge by refining what is known and by bringing in additional expertise relevant for knowledge creation. The aim is to utilize an existing knowledge domain.
3) *Insourcing Knowledge*: The key challenge is to build up a *new* knowledge domain by acquisition and/or transfer of knowledge from external sources (strategic partnerships, alliances, etc). This strategy helps to attain innovation goals by teaming up with partners or by co- constructing knowledge. The creation of new knowledge requires that people have access to competences of employees and continuously capture new knowledge from questions and answers from internal and external sources.
4) *Exploring Knowledge*: This knowledge strategy provides a group, team, community, or network the opportunity to build up a *new* knowledge domain from scratch. Here one must identify participants ('intrapreneurs') with an interest in doing something *different* within an organization because creating new knowledge in a new knowledge domain is like realizing dreams with a deadline.
5) *Open Source Knowledge*: Within an open source knowledge strategy an organization makes its valuable knowledge (partly) accessible for external stakeholders via the Internet without charges or limitations to future distribution by third parties. Social network sites

[3] Based on: Von Krogh, G.,I. Nonaka, M. Aben, (2001) Making the Most of Your Company's Knowledge: A Strategic Framework, *Long Range Planning*, Vol. 34, pp.421 – 439.

supported by Web 2.0 technology (e.g. Facebook, Linked in) are created to allow people to share their knowledge and personal values and experiences.

Many organizations are currently involved in making knowledge maps of all internal and external knowledge they possess or should be developed and/or acquired to serve markets and customers. Such maps help to distinguish certain key knowledge areas. Although many knowledge organizing activities regularly occur in organizations - even when their core business mainly deals with tangible products and services - Kianto & Harju (2008, p. 349) recently concluded that there is "much management of knowledge going on in these organizations, regardless of whether it is labelled as such by the actors themselves (Kianto & Harju, 2008, p. 349)." These kinds of knowledge awareness processes are needed to establish the difference between valuable knowledge and peripheral and/or excess knowledge. A current trend in organizing knowledge is to tie valuable knowledge to some kind of monetary standard. For example the Danish Guideline (Rimmel et al, 2004) provides a number of methods and techniques to quantify knowledge in money terms, either as a part of the balance sheet of companies, or as a stand alone – off-balance - aspect of management. As there is currently a lack of standardization on reporting intellectual capital, the notion underlying this way of quantifying and valuing knowledge is the expectation that managers in general will pay more attention to knowledge if their is more money involved with it, then they would do otherwise, under the overall assumption that many managers still regard knowledge as something exotic and hard to organize.

Step I: Dimensioning

Through the process of '*dimensioning'* knowledge, a stronger link can be established between strategy - towards markets and customers - and in-house performance. Dimensioning can be defined as the creation of a mental map which makes people feel comfortable ('in their minds') as to where, when and how they can add value. However, due to the difference in position of each observer, each person experiences a different 'reality'. Furthermore, people are generally unwilling to accept someone else's model of their own 'realities'(Johnson- Laird, 1983; Johnson – Laird, 2005). Nevertheless, humans understand the world by constructing models of it in their minds. These models are simpler than the reality they represent and are therefore *incomplete* by definition (Johnson – Laird, 1983; Chermack, 2003). Mental models are the lenses through which we see the world (Forrester, 1961). Wiig (2004) shows that many of these mental models are also reference models. The mental models encode situations that we know from personal experiences, that we have learned from other sources, or that we have generated in our own minds from

thought experiments and speculation, goal-oriented reasoning, or 'just thinking' about something. Hence, mental models can reflect reality or imagined situations. Beyond mental models, we possess other kind of mental constructs such as facts, perspectives, concepts, truths and beliefs, judgements and expectations, methodologies, and know-how. There are many definitions of mental models (Chermack, 2003; Johnson- Laird, 2005; Santos & Garcia, 2006)

Mental models incorporate our biases, values, learning, experiences, and beliefs of how the world works. Cognitive psychology literature focuses on mental *representations*. Representations refer to the way humans build 'stand-ins' for reality in their minds. The concept of representation can best be introduced by considering that the mind and brain are involved in coordinating the behaviour of an organism in its environment. To coordinate such behaviour, "*an organism must create some working understanding of its environment, and it does so by constructing a mental representation, or model, of that environment* (Chermack, 2003, p. 411)". A *cognitive map* refers to the way the mind creates a map or model of a situation that it uses as a reference point. Weick (1979) and Weick, Sutcliffe & Obstfield (2005) have argued that mental models guide, shape, and provide the basis on which individuals interpret and make sense of organizational life. The significance of mental models in organizations is that a managers' mental model shapes the organization's form, its strategy and its people management and the way Operational and strategic knowledge is generally represented and valued.

In our approach, the first step of the process of dimensioning is drafting a *knowledge map* which encompasses all key knowledge domains relevant to realizing business and organizational goals. Each knowledge domain can be broken down into several knowledge areas. A knowledge area is a collection of knowledge (needed, specific, crucial) that can be enriched and applied in order to guide the achievement of specific, but not always specified, goals.

"Don't waste time, money and energy in trying to harvest *all* available knowledge. Focus on *valuable* knowledge that one either can't afford to lose or will be put into value for relevant partners and other stakeholders".

These knowledge domains become dynamic when attached to the *intentions* of what needs to be achieved to realize successful performance. Intent can in this respect be defined as the underlying motivation of people to realize strategic and operational targets and objectives, 'as their minds see

fit' within the overall setting of an organizational arrangement. Intent is a phenomenon diffused at multiple organizational levels and needs to be possessed by some or all of its members. For collective intent (*'we-intent'*) to be created, each member of a collective needs to be able to formulate a conception of, or adjust to, the intentions of a significant number of other members in the collective (Mantere & Sillince, 2007). Whereas strategic and operational objectives are content-based, 'intent' is used to direct and guide people's performance to what they (collectively) stand for and are best at in their work. For example, Hamel and Prahalad (1994) define strategic intent as an ambitous and compelling dream that energizes and that provides the emotional and intellectual energy for the journey to the future. On the one hand strategic and operational objectives tell workers *what* to realize, while the intent tells them *why and in what direction* they should employ their minds. Once this has taken place, intentions can be linked to challenges in terms of knowledge creation and knowledge value and these can be set, organized and managed using indicator approaches common in management.

Case Statistics Netherlands (CBS) part 1

For example, within Statistics Netherlands (CBS) collecting reliable data and information to provide statistics is an important component of the overall statistical process. Both primary and secondary data need to be collected. Primary data collection consists of asking companies and citizens directly for information. In secondary data collection, information about companies and citizens is taken from official sources, for example those of the tax authorities, social insurance organizations or government agencies and offices. As a consequence of the existing thematic structure of the CBS organization which consists of three divisions ('social-spatial', 'business economic' and 'macro-economic' statistics), current data collection is dispersed. Internal knowledge on Data Collection is fragmented, synergy effects are difficult to realise and data collection processes are not uniform and therefore less efficient because of overlaps and inconsistencies. After having re-examined the mission, vision and strategy, Data Collection formulated the 'intent' of high performance. Intent can in this respect be defined as the underlying motivation of people to realize strategic and operational targets and objectives, 'as their minds see fit'. They realized that it is this intent that helps people to focus their minds on what needs to be done better and better. The mission statement of Data Collection was:

"At the request of and for the use of its customers, CBS Data Collection collects high quality input for the production of statistics; by collecting reliable data, using professional and flexible staff, in an effective and intelligent way, with a minimum burden for the public, business and government."

It quickly became clear that this mission statement didn't actually cover the intent underlying the core processes of Data Collection. It also became clear that the intent could not be formulated unless it first became clear what the core knowledge requirements were. New issues and evolving knowledge from different perspectives (stakeholders) were explored. How an organization conceptualizes information and knowledge greatly impacts the way they deliver their value propositions to clients/customers. The process of *dimensioning* starts by drafting a knowledge map which consists of all those key knowledge domains and knowledge areas relevant to the purpose of Data Collection. Within the overall process of Data Collection, four key knowledge domains were identified: 'Policy', 'Survey Design', 'Direction' and 'Implementation'. The knowledge domain 'Survey Design' provides meta-information for the way content is and should be organized and distributed. Typical survey design products are formats, models, regulations, indicators and descriptions. Once it is clear which knowledge areas are important, specific intentions can be linked to the way in which these should be enriched to provide added value. Table 1 below presents the knowledge areas of the knowledge domain 'Survey Design', with the corresponding management intentions, the nature of the required knowledge and the challenges for managers and professionals.

Knowledge domain: Survey design			
Knowledge area	**Management intention**	**Nature of knowledge**	**(Management) challenge**
Questionnaire design	**Outline of questionnaire supporting meetings with clients. Questionnaire design as instruction for field work.**	**Learning/ Instructive**	**High quality statistics based on minimum survey burden.**

Sample design	**Outline of sample supporting meetings with clients. Sample design as instruction for field work.**	**Learning/ Instructive**	**High quality statistics based on minimum survey burden**
Approach strategy	**Approach instructions for field work.**	**Learning/ Instructive**	**Depending on the assignment:** **- Minimum possible costs** **- Highest possible response**
Survey expertise	**Innovation of survey design and respondent communication; integral agreement between all data users within NL**	**Innovative**	**Stimulation of response behaviour.** **Insight into compliance principles** **Uniformity in unique variables.**

Table 1: Knowledge Domain : Survey Design

In turn these knowledge domains can be broken down into knowledge areas. A knowledge area is a collection of knowledge (needed, specific, crucial,) that can be enriched and handled to achieve its intent simply by 'mixing' the right kind of people – with the right mindset - with the right kind of ICT. Table 1 shows how to focus the attention and concentration of managers and workers on what constitutes 'better performance'. This approach leads away from all those distractions which are less relevant - or even irrelevant - as they are not included in this process. Thus, dimensioning also frees the minds of people to actually do what must be done in a better way than before. After all, designing often is playing with alternatives (don't get stuck on the first 'sketch')

Summary:

Dimensioning (step 1):

- Re-examine mission, vision and strategy (scenario's) of the unit through stakeholder analysis (e.g identify current, new and future clients) and map key developments
- Determine strategic knowledge domains (do they create value? How much? For whom)
- For each domain: identify knowledge areas
- Connect knowledge areas to management intentions
- Link knowledge area to type of knowledge
- Formulate a challenge and sketch possible solutions

Step II: Orientating

Human beings constantly create or construct new mental models, and so the content of the mind is by its nature open and not easy to define (Karp, 2005). By focusing the minds of knowledge workers ('mental space') to the best possible creation and use of knowledge by means of the organizational form in which they work, a simple - but highly effective - performance mechanism is set in motion: preventing people from being distracted by matters which are of no concern to them. Just by putting people in an organizational context which notifies them what the key success factors in the use, creation and exploitation of knowledge are, will set their minds in the right 'mode'. People will direct their attention and concentration towards accomplishing what needs to be done for personal and organizational success.

Less is More

The objectives of David Allen's *Getting Things Done (GTD)* are simple. GTD is about identifying *all* the things that claim your attention, categorizing them into doable chunks, and then making conscious decisions about exactly how to proceed in accomplishing both the immediate tasks and the larger, longer-term items. Allen's productivity practices stem from a simple philosophy: You can achieve exponentially more by removing everything that clutters up your concentration and focus (Ehrenfeld, 2007, p. 6 – 7).

With the information and knowledge floodgates wide open, content rushes at workers in countless formats (text messages, twitter 'tweetback', Facebook alerts, linked in workgroups alerts, email etc). This kind of information and knowledge overload initiates constant interruptions:

> *"When you respond to an e-mail alert that pops up on your screen or to the vibration of your BlackBerry when you're "poked" by a Facebook friend, you do more than spend time reading the message. You also have to recover from the interruption and refocus your attention. A study by Microsoft researchers tracking the e-mail habits of coworkers found that once their work had been interrupted by an e-mail notification, people took, on average, 24 minutes to return to the suspended task* (Hemp, 2009,p.85).".

Organizations increasingly are becoming aware that one of the scarcest resource is the attention of people. How do people allocate their 24 hour days determines how much value is created or potential value is destroyed.

"If attention goes one place, it cannot go another (Davenport & Beck, 2007, p.11)*"* Humans are not 'designed' to maintain a constant focus on assigned tasks and activities. We need periodic breaks to relieve our "minds" of the pressure to perform (Koerner, 2010), Amabile & Kramer (2007) have explored a crucial driver of a knowledge worker's performance - a person's inner work life i.e. the emotions, perceptions, and motivations that people experience as they react to and make sense of the events of their work days – and how the inner work life affects performance. When they compared the participants' best days with their worst days, Amabile & Kramer (2007, p.81) found "that the single most important differentiator was a sense of being able to make progress in their work (achieving a goal, accomplishing a task, or solving a problem)".

> *"When people are blocked from doing good, constructive work day by day, they form negative impressions of the organization, their coworkers, their managers, their work, and themselves; they feel frustrated and unhappy, and they become demotivated in their work. Performance suffers in the short run, and in the longer run, too. But when managers facilitate progress, every aspect of people's inner work lives are enhanced, which leads to even greater progress* (Amabile & Kramer, 2007, p. 83)."

Orientating connects the *nature* of knowledge – routine, learning and innovative knowledge (Lekanne Deprez & Tissen, 2009) to the '*mentalization'* of work (Amabile and Kramer, 2007). Three types of knowledge and knowledge work exist: 1) routine knowledge, 2) learning knowledge and 3) innovative knowledge. The application of routine knowledge generally allows for high levels of knowledge productivity, similar to labor productivity in the industrial based economy. Learning knowledge refers to all new knowledge generated to improve both individual and systemic performance, but only insofar this knowledge remains within predefined thresholds, boundaries and limits. Innovative knowledge concerns all 'boundaryless' knowledge relevant to the development and exploitation of new products and services and new ways of working. Interestingly, once the nature of knowledge work is connected to the '*mentalization*' of work (Amabile and Kramer 2007) - i.e. to the nature and way people employ their minds towards the best use of knowledge - distinct 'spaces' can be identified, organized and utilized aimed at enabling people to better focus their attention and concentration on what needs to be done better in a foreward looking manner.

Case Statistics Netherlands (CBS) part 2

Within Statistics Netherlands the managers of the Data Collection pilot believed that modern work is all about mental focus; about catching peoples minds. Humans understand the world by constructing models of it in their minds. These models are simpler than the reality they represent and are therefore incomplete. Without applying mental discipline to direct our attention (Biro, 2007), our mind is 'overloaded' with distracting thoughts, making it difficult, if not impossible, to notice what is actually happening. An undisciplined mind is a noisy, confusing and busy mind.

The process of *orientating* aims to improve the performance of knowledge workers by providing both focus as well as mental space through spatial arrangements. These arrangements not just allow for the free flow of knowledge, but more importantly for the free flow of minds (Hooker & Csikszentmihalyi, 2003; Gardner, 2004). The whole issue is to bring people into an organizational context which would put people on the right mental track, without them being distracted from it. This way of organizing work is in strong contrast with current practice. Statistical Netherlands basically asks people to have an open mind for everything and to react to all that comes across their path. The pilot team saw the opportunity arising from spatial design theory to focus the minds of people, by separating their attention and concentration into three types of knowledge:

a) Routine knowledge (production, implementation, channels, etc.),
b) Instructive knowledge (increasing productivity, optimisation of data collection processes,
c) Innovative knowledge (redesigning approach methods, innovation of survey design, etc.)

They want to be able to successfully use data in more innovative applications across Statistics Netherlands and develop a 'culture of contribution' (Hecksher, 2007) where they will gain the ability to feel special.

Summary

Orientating (Step II)

- Orientating connects the *nature* of knowledge – routine, learning and innovative knowledge to the '*mentalization*' of work i.e. to the nature and way people employ their minds towards the best use of knowledge

- The process of *orienting* aims to improve the performance of knowledge workers by providing both focus as well as mental space through spatial arrangements.
- The whole issue is to bring people into an organizational context which would put people on the right mental track, without them being distracted from it
- For *each type* of knowledge the mental part (attention and concentration) and the intent (steering) is sketched. To give people the right direction to put their minds to, while at the same time supporting them to fill in the voids. In the end what this is really about is people have created value for their organization and for themselves.

Step III: Formatting

A deliberate organizational design is more than its 'structure' (Stanford, 2005). The challenge in designing spatial organizations is being able to look beyond the structure of an organization. Organizations have to continuously reconfigure their activities to meet changing demands in their internal and external environments (Raisch et al, 2009). Spatial organizational theory embodies the notion that modern organizations cannot and should not be overall dynamic, i.e need not be dynamic in all areas, levels and aspects of their organizational design. The process of formatting allows modern organizations to be *selectively dynamic*: adopting temporary degrees of stability during volatile times. Designs that are fit for variation and uncertainty in the early – entrepreneurial - life cycle of an organization will be unfit for efficiency, standardization and modularization required later and vice versa (Westerman, McFarlan & Insanti, 2006). There is among researchers a diversity of viewpoints how to design an organization to adopt new innovative processes that will generate the next generation products, services and profits. Within this context, a *format* provides a specific internal and external environment fit for organizational design activities. Formatting is the process of presenting, visualizing and capturing valuable information and knowledge in such a way that it is useful and exploitable to target groups in the organization in an efficient manner. This requires several steps such as:

- prioritize and visualize the available information and knowledge content (what is valuable information and knowledge). Formatting requires writers, videographers, and instructional designers who possess the right skills. It is critical to be selective about what information and knowledge to put time and energy into formatting.
- anticipate whom the recipients are. Targeting recipients allows designers to know what content to include, what to leave out, how much context is necessary for understanding and translate for different contexts (management, employees, customers)

- determine their absorptive capacity for this content. An organization will only absorb as much valuable content as the organizational form and mentality of the individual workers will allow. People like to review and digest knowledge in smaller (modular) segments.
- Selecting Formats: There are procedures and protocols that are best transfered as a story, others that are effective as case studies or as displays of charts or graphs. Some require pictures or video to make them understandable. The question of what format would best convey the information and knowledge is a design decision. Formats need to be tailored to the anticipated user.
- identify the medium through which the content would be best expressed.
- capture the valuable information and knowledge (Based on: Dixon, 2010)

An important way to steer and influence the performance of knowledge workers is to standardize and modularize work as much as possible and use technology to both support and reinforce this process. Even in todays' organizations a lot of work has already been formatted and many work activities 'captured' in procedures, protocolls, rules, regulations and guidelines. It is however difficult to direct people's attention on improving these formats, i.e. to impose standardization and modularization with a focus on quality and productivity ('mass customization of knowledge'). Technology enables people and organizations to prevent the situation from happening that all mental space of people is 'occupied' by an overload of activities, new information and knowledge (Hemp, 2009). Only the right mental space creates the required 'moments of value'.

Case Statistics Netherlands (CBS) part 3

Formatting includes providing ongoing degrees of standardization of all knowledge-based work (routine, learning and innovation), by providing compelling formats, procedures, rules and regulations to managers and workers. These 'obliged' knowledge supporting products, services and processes make it easier in practice to focus attention and concentration, particularly when ICT is used to enforce better performance. They allow modern organizations to be selectively dynamic. Here, the term 'enforced' should however not be viewed as 'ordering someone to do something', but as a means to invite managers and workers to realize their intention to do their work. At CBS Data collection systems are linked via an Enterprise Service Bus (ESB) to guide and facilitate knowledge passing freely - without undue barriers - between persons and groups. Customer Relations

Management (CRM) fulfills an important role in the design, planning, direction and distribution, implementation and exploration of 'formatted' knowledge. A CRM package is employed to make real time information easily findable and of high practical value, usable for all managers and workers.

Earlier the Blaise system was referred to as a software system developed for computer-assisted surveying. For workers in the modular arrangement (Lekanne Deprez & Tissen, 2009b) of the Contact Centre, Blaise provides 'scripts' which guide interviewers through the entire interview process. Their attention and concentration in doing so is directed by an integrated ICT solution, called the Cati Management system, a component of Blaise. Cati can also control the order in which respondents are presented to the interviewers, so that the sample can be used as effectively as possible. The use of Cati has an important effect on the quality of data and thus on the quality of the concluding statistics.

Summary

Formatting (Step III)

- Formatting is the process of presenting, visualizing and capturing the valuable information and knowledge in such a way that it is useful and exploitable to target groups in the organization.
- Important steps are:
    - prioritize and visualize the available information and knowledge content (what is valuable information and knowledge).
    - anticipate whom the recipients are.
    - determine their absorptive capacity for relevant content.
    - select formats: The question of what format would best convey the information and knowledge is a design decision. Formats need to be tailored to the anticipated user.
    - identify the medium through which the content would be best expressed.
    - capture the valuable information and knowledge.

The three step DOF–approach results in *spatial arrangements* of knowledge, people and technology that can be considered as 'distinct' organizational forms which exist 'naturally' and/or are 'formed' in the minds of people. These forms can be made *explicit* by means of organizational forms, in order to establish a more direct – but naturally fitting - relationship between what

people 'have in their minds' - various organizational forms - and their actual performance. A variety of organizational forms can be distinguished, all depending on the preferred type of knowledge people possess, in relation to the performance which is expected and even required from them: the *modular, circular and cellular* form. In an earlier NRI-paper (Lekanne Deprez & Tissen, 2009, pp. 37 - 44) these spatial arrangements were discussed in detail. Below the highlights are presented.

A *modular arrangement* assumes that each module constitutes only one dominant – single minded - way of people working with knowledge. It's about the efficient application of knowledge, preferably through intensified automation. Efficiency is the key word: costs can be kept low because knowledge production as a whole is streamlined. People are only deployed if they can contribute to optimising efficiency. Non-core knowledge functions and processes are all out- or offsourced, while the core of the network maintains full strategic control.
Four principles govern the design of modular arrangements:

- First, break key knowledge processes up into separable modules that can be produced on a stand-alone basis.
- Second, design interfaces that allow different modules to work with each other. In a modular architecture, the components are not tightly coupled. This allows changes in some components not to affect the design of components (Huber, 2004).
- Third, outsource knowledge chunks that can be made more efficiently by external contractors.
- Finally, enable the organization to focus on assembling the different chunks of the knowledge created in-house and outside, by means of technology and connectivity.

The key to *circular arrangements* is to facilitate and install a 'willingness to learn' - culture and therefore create knowledge sharing processes that will produce "moments of value" – those fleeting moments of true human and digital interaction that define an organization's image and performance. Personal learning is considered as a desirable side effect but is not the major goal for organizing knowledge in a circular way.'
Four principles govern the design of circular arrangements.

- First, a number of design rules for defining decisions as well as the decision-making process are created and decision-makers identified and linked to each other (Romme & Endenburg, 2006, p. 296);

- Second, guiding tools and techniques are developed in the setting of learning objectives and of organizing and improving learning at the individual, group and organizational level;
- Third, the arrangement is focused on process and result solutions, rather than on problems and issues;
- Fourth, the circular approach acknowledges the ill-defined and embedded nature of organizational processes, and uses broader purposes, ideal-target solutions and systems thinking, to guide long - term organizational development

A *cellular arrangement* is made up of cells (self-managing teams, autonomous business units) that can operate alone and in interaction with others. It is this combination of independence and interdependence that allows a cellular arrangement to generate and share the know-how that produces continuous innovation. Chowdhury, Endres & Endres (2000) present a *revised* cellular organization that is not only ideal for knowledge creation and innovation, but also able to ensure proper maintenance and utlilization of existing knowledge.
Three principles govern the design of a cellular arrangements:

- Each cell (group, team, business unit etc) has an autonomous and entrepreneurial responsibility to be inherently innovative;
- Each cell must be able to continually shape and reshape itself in order to live up to its promise
- Each cell is rewarded for acting independently in a business-like manner (Miles et al, 1997, p. 12).

All around the world work is becoming more knowledge-intensive and knowledge-based (Davenport 2005; Heckscher 2007; Donkin, 2010; Frost, Osterloh & Weibel, 2010). Once complex knowledge work takes place, this is increasingly regarded as 'mindful' work, i.e. as cognitively embedded, intense, passionate, time pressured, and collaborative. Mindfulness means being awake, aware and constantly attending to oneself and the world around. Following Levinthal and Rerup (2006), mindfulness is conceived as involving attentiveness as well as the ability to respond agile to 'cues'. By contrast, less mindful work involves *fewer* cognitive processes and *greater* reliance on previous routines. 'Mindful' work requires 'framing': to choose one particular meaning (or set of meanings) over another. It's about framing and reframing data,

information and knowledge to identify patterns, concepts and opportunities and ultimately develop a focus on what is most important to a client, user, partner, customer or any other stakeholder. So far spatial organizations has proven to be a master in the intuitive – not explicit - art of framing. Without an organizational arrangement that enables and encourages the organization to anticipate, understand and respond to the needs and requirements of stakeholders, it is difficult to deliver something of value – through 'moments of value' – to key clients and customers. It's a harmonious combination of the formal and informal ('shadow') organizational arrangement that makes spatial organizations adaptable, emergent, flexible and agile. Spatial organizational designs provide a temporary shelter for adverse and turbulent environmental conditions. We believe that each organization can be understood according to a '*spatial reading*' (Chanlat, 2006, p.21). One way to enable this kind of understanding of reality is by using what Oliver & Roos call 'the knowledge landscape metaphor' (Oliver & Roos, 2000). Within the Statistics Netherlands case we used this metaphor to position the CBS unit Data Collection by portraying the key knowledge domains, the support units and the relationships ('knowledge trails') between them (see figure 4).

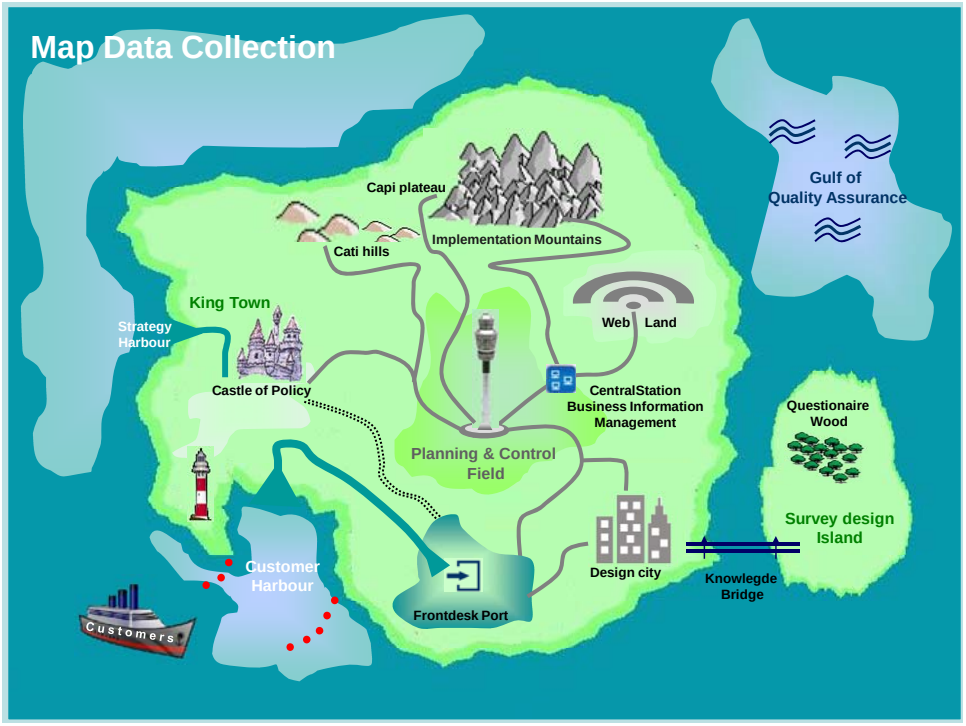

Figure 4: The Knowledge Landscape of CBS Data Collection

The purpose of this landscape of the CBS Unit *Data Collection* was to create a guiding image for the CBS knowledge workers to personally - as well as collectively - be able to demonstrate their joint contribution to knowledge building, sharing and creation. The more knowledge they are able to turn into value, the better prepared and the more sustainable the CBS organization will be in the long run. Thus, the knowledge CBS cannot use to create value does not make up part of the knowledge landscape. An important part of the map are 'knowledge trails': what a person and/or unit has learned and experienced from the past. How far advanced are we on each knowledge trail and knowledge domain? By identifying current 'knowledge in use', it becomes possible to direct and even rearrange trodden knowledge paths and knowledge domains, with a view on creating better – more efficient and effective - outcomes and results. Subsequently new landscapes can be developed on the basis of identifying future knowledge gaps and needs where our environment requires us to create new knowledge.

Oliver & Roos (2000, pp. 41 – 42) believe that *"by identifying which direction we would like to travel, we can begin to make decisions about how to explore these new regions of our knowledge landscapes, either by bringing in others to the explore the peak [of a mountain], or by climbing it ourselves."* Just like the art of designing spatial organizations, this knowledge landscaping process is highly dynamic and never complete. Living and working in an always – online world of work, it is easy to become overwhelmed with different opportunities to gather new data, information, knowledge, images and so on. The competition for the attention of knowledge workers is a zero – sum game: Attention we pay to a particular element means attention they cannot devote to another. Spatial organizational design recognizes the importance of playing this zero – sum game best by 'paying attention to where the knowledge workers should pay attention', each within their own knowledge domain and recognizing its specific knowledge trails each individual worker has obtained. Spatial organizations organize and share data, information, knowledge, images in such a way that its 'members' can organize themselves to shine and add value and pay attention to what matters most.

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