

EXPLORING REQUIREMENTS OF AGILITY FOR KNOWLEDGE MANAGEMENT

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Abstract: Organizations have to sense and respond rapidly and flexibly to changes in their markets, in short: they have to be agile and this capability to be agile can be a source of competitive advantage. This research aims at

- (1) understanding the concept and definition of Agility;
- (2) exploring the impact of Agility on knowledge management in a company;
- (3) giving recommendations on how to manage Agility considering strategic usage of knowledge management;
- (4) proving the interdisciplinary application of Knowledge Management to enable Agility

Based on a literature review, a definition of Agility is developed. Furthermore, an exploratory case study within Siemens AG including 23 structured interviews with executives and managers is used to reflect and analyze demands on a firm's knowledge management in order to increase Agility. The case study reveals three perceived drivers for Agility: customers, competitors and Mergers & Acquisitions. Consequently three knowledge-oriented core competencies of an organization are summarized for increasing Agility: Real-Time Ability, Transformation Capability and Strategic Options. Finally, this paper suggests a framework for managing Agility. This framework was used at Siemens AG for its Global Diversity Initiative and illustrates how to prove the application of interdisciplinary Knowledge Management to enable Agility.

Key words: Knowledge Management, Interdisciplinary Knowledge Management, Competency, Agile, Agility, Enterprise Agility, Business Agility, Organizational Agility, IT Agility, HR best practice, Diversity Management, Diversity Measurement, Diversity Scorecard, Real-Time Ability, Transformation Capability, Strategic Options, Strategy, Agility Strategy, Flexible, Flexibility, Flexible Organization.

1 Introduction

The Facebook story is about Agility – the ability of an organization to implement rapid iterations in their products and services [Ar10]. There has been significantly growing interest in Agility amongst both the academic and practitioner communities. However, as was clearly shown in a panel discussion on the Agility at the CIO Summit at MIT in 2004 [Sc04], there has been no consensus on the exact meaning of Agility, nor on how to achieve Agility. Even today, no commonly acceptable definition in academic communities exists.

The increasing level of uncertainty, complexity and globalization of the turbulent marketplace requires new organizational configurations and operating models [PL05]. In real business, CEOs worldwide have perceived and repeatedly confirmed that Agility is crucial to surviving under today's extreme competition. Top-managers pointed out that "adaptability to change" and "speed to market" are at top of their "challenge-faced-list" [Sm07] [Mc06] [Ib06]. Large global companies such as Siemens have more than 15 Mergers & Acquisitions activities per week. Ensuring the merger's plans are met becomes one of the challenges top managers face. Furthermore, companies have to be agile enough to fulfill government regulations such as Sarbanes-Oxley or BBBEE (Broad-Based Black Economic Empowerment, a diversity certificate released by South African government). Finally non-economic uncertainty such as terrorism and natural disaster shows that the Agility is definitively necessary [Be04]. However, being agile requires organizations' capability to know where and why these changes take place and how to react. Knowledge Management (in following "KM") has been perceived as a key enabler to achieving this capability.

All of these facts show that Agility becomes one of the most interesting issues for research and practice. The aim of this paper is to analyze the concept of Agility and its impact on the KM within a company. The following research questions are addressed within this paper:

- What are the established concepts and definitions of Agility?
- What impact does Agility have on KM within an organization?
- How to manage Agility considering the interdisciplinary application of KM?

2 Agility

Numerous articles and books have attempted to define Agility. The different definitions have their own context or utility to some community. Agility is a concept that extends flexibility to include speed and scalability [BMP05]. By analyzing holistic company-wide flexibility, Horstmann categorizes different types of Agility and flexibility [Ho05]. Such approaches include *strategic* and *operative* Agility (level), *long-term* and *short-term* Agility (duration), *proactive* and *reactive* Agility (moment), *quantitative* and *qualitative* Agility (measurement), *external* and *internal* Agility (environment).

Focused on interrelated capabilities of Agility, many authors distinguish, *customer* Agility (demand-side initiatives), and *partnering* Agility (supply-side initiatives), and *operational* Agility (internal initiatives) [SBG03][TW93]. Meffert distinguishes *offensive* and *defensive* Agility by analyzing the intention of impact. Goranson categorized higher (external) and lower (internal) types of Agility [Go99]. Furthermore, he has categorized numerous definitions into three concepts of Agility co-existing for the term: (1) *mass customization*, (2) *expected* or constantly accelerating type of change, and (3) “the ability to change when an *unexpected* change or opportunity appears” [Go99]. In the business and management context, many authors have defined this term with different aspects.

- (1) Agility is the capability to identify and capture opportunities more quickly than rivals do [Su09].
- (2) Agility is the set of possible business initiatives a firm can readily implement leveraging pre-determined competencies with managed cost and risk [WWM06]
- (3) Agility is the ability to detect and seize market opportunities with speed and surprise [SBG03]
- (4) Agility is primarily concerned with the ability of enterprises to cope with unexpected changes, to survive unprecedented threats from the business environment, and to take advantage of changes as opportunities [ZS00].
- (5) An agile company is one whose processes are able to respond effectively to rapid and unexpected change [Go99].
- (6) Agility is the ability of an organization to thrive in a continuously changing, unpredictable business environment [Do99].
- (7) Agility is a comprehensive response to the business challenges of profiting from rapidly changing and continually fragmenting global markets for high-quality, high-performance, customer-configured goods and services and being dynamic, context-specific, aggressively change-embracing, and growth oriented [GNP95].

Box 1: Selected Frequently Cited Definition

Amongst more than 30 definitions of Agility reviewed by this research work, the Box 1 lists seven definitions which have been most frequently cited by publications. Three key characteristics can be filtered out and summarized as *sensing* ability (“What’s going on out there”), *responding* ability (“How to react”), and ability of *seizing* opportunities (“How to convert negative causal factors into positive competitive advantage”). These characteristics map the multidimensional view of Agility and provide the basis for a formal definition as well as a related simple measurement. Based on the definition review and taking all of these considerations into account, Agility can be defined as follows in Box 2.

Agility is capability of a company (1) to sense *expected* and *unexpected* environmental changes, (2) to respond more *rapidly* and *cost-effectively* than competitors and (3) to seize *opportunities* that become available due to that change, through implemented *proactive* competencies.

Box 2: Definition of Agility (Source: Own Definition)

As the focus of flexibility refers to expected changes and is a subset of Agility [Go99] [WW99], the expected change is logically an aspect of Agility definition. Leading companies can anticipate environment change in a manageable way. The more precise the forecast is, the less are the costs caused by that change. In contrast, dealing with unexpected change is more challenging. In this case, response is innovative rather than pre-engineered. The difference between agile and rigid organizations is the speed of response in comparison with expectation of stakeholders and their competitors. One day or one year has significant influence on the business. The ability to react towards a change can be well measured by cost. When changes take place, an agile company is able to minimize the expenses in time, money and other resources, whilst others expend resource to survive. However, many changes are accomplished through opportunities, e.g. new markets, new solutions to existing problems, new talent groups or new business partners. Fortune is with those who are well-prepared. Agile companies capture opportunities from change and generate competitive advantages on which to thrive. For companies without proactive competency, change brings chaos, even enlarges their size over time or cascades over boundaries of company's entities and processes.

3 An approach for managing Agility

Defining Agility per se is not necessarily a significant contribution but also helps to show the holistic basis while narrowing down many aspects around the core of a subject. The case study applied the developed definition and, more importantly, collected and analyzed data to show the requirements for KM in increasing Agility.

3.1 Case Study and Research Methods

The case study was conducted at Siemens AG, an S&P 500 company, headquartered in Munich, with revenue of 77 billion Euros in 2010, approx. 400,000 employees worldwide and pioneering in energy, healthcare and industry products and solutions.

The first part of case study relied on *theoretical sampling*. 23 interview partners were chosen for theoretical, not statistical, reasons. This methodology is based on the central idea that theory-building research is begun as close as possible to the ideal of no theory under consideration and no hypotheses to test [Ei89]. Emphasis on specific relationships between variables and theories was avoided as far as possible. *Data collection* for this case study primarily took the form of structured in-depth interviews. Additionally, complementary data was also obtained from archival documentation, policy or strategic papers, historical investigations, corporate research reports, workshops and forums. The case study used highly synergistic combination of *qualitative with quantitative evidence*. The *population* of this case study is the Siemens AG. The interview was concentrated on *three target groups in senior management level*: business leaders, IT managers and external consultants. All interview partners had a strong academic background (Master Degree, MBA or PhD) and many years of management experience. The second part of case study was focusing on application the findings of first part by using the developed Agility Framework for the Global Diversity Initiative of Siemens AG.

3.2 Empirical Findings

Interview partners were asked to name the three most important and frequent drivers that force their business to be agile. At the top of the ranking, “customer power” and “competitors”, which both stem from outside of Siemens AG, are the dominant factors.

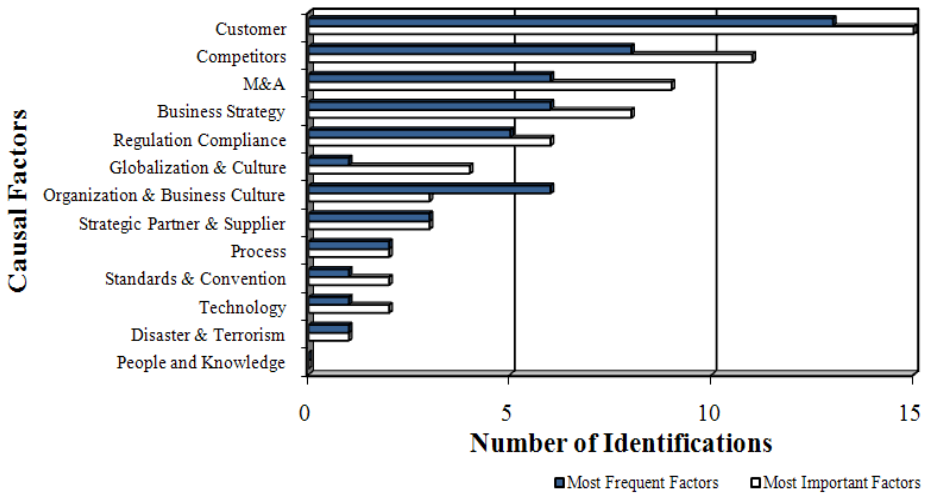


Figure 1: Ranking of Most-Important Drivers for Agility (Source: Own Investigation)

Of *special note* is that “Mergers and Acquisitions” are widely seen as one of the most important causal factors by the interview partners. Other researches have also identified this as an important factor causing Agility which companies have to address [Va05]. After evaluating the company’s agility, interview partners were asked to determine to which degree of KM is important in achieving greater Agility, on a scale of 1 for “not important” to 5 for “very important”. The average evaluation is ranked in Figure 2. IT has also been emphasized many times as being a required key enabler.

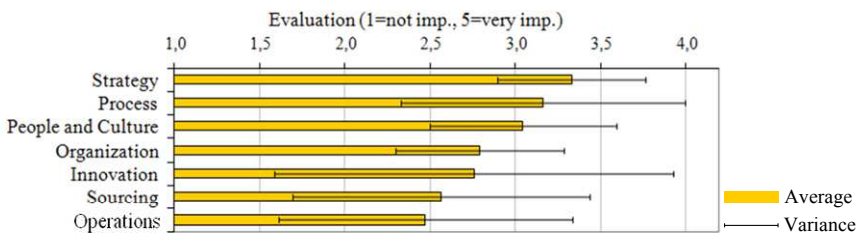


Figure 2: Pursuing Agility - Dimension Ranking by Importance (Source: Own Investigation)

Based on the findings of the case study, the requirements for KM to achieve Agility were identified and can be interpreted as the impact of Agility on KM. The interviewees highlighted three important knowledge-oriented competencies required by firms pursuing Agility: (1) Real-Time Ability, (2) Transformation Capability and (3) Strategic Options.

3.2.1 Impact 1: Requirements for Real-Time Ability

Both the sensing and responding ability of an agile company require quick (re)actions. Here, the speed of knowledge identification and knowledge generation are the key. IT-enabled business change focuses on time-based transformation, because it must meet the current needs for tight financial controls, rapid justification of changes and transparent measures of value creation [Ra02]. In practice, Agility is about rapid access to information (both internal and external to the organization), which drives real-time actions. The Explicit Knowledge enables relatively more than Implicit Knowledge [NT95], since real-time ability can be easier achieved by internalization and combination of systematic information rather than experience or conceptual knowledge.

The integration of internal und external data in real-time and business process automation enables *Process Efficiency*, while real-time analysis is accelerating the *information transparency*. The faster the data is transformed into meaningful information and then into useful knowledge, the more up-to-date, and even up-to-the-minute, can people see the business impact.

3.2.2 Impact 2: Requirements for Transformation Capability

Agile companies that rapidly and successfully adjust themselves to the changing environment are moving toward the goal of transformational businesses. What kind of companies can more easily transform themselves? Those companies with an easily recognized meta-model or structure. Here, the key is the knowledge about your organization, business model and processes. For example, empirical studies show that the flatter an organization hierarchy is, the more agile it will be with regards to transformation [Ga94], because the lean structure is simple for transformation. Transformation takes place not only at the architecture level (re-usability and abstraction), but also at the organizational level (change proficiency).

Interdisciplinary knowledge development and knowledge distribution plays an important role. Issues are generally involved with the *reconfiguration* of existing elements and their interactions, sometimes with consideration in adding or deleting elements as well [Do04][RWR06], for example product portfolio, change of talent culture. *Reusability* means that the existing assets (e.g. service, applications, network resources etc.) should be leveraged, along with new ones, seamlessly across the organization. Service-orientation and modularity in company architecture to with great granularity directly or indirectly facilitates reusability. Transformation can be enhanced by separately abstracting the business process and rules “engines”. *Abstraction* enables firms to have a layered or networked architecture with interacting – loosely coupled in terms of new business models and business process logic, but tightly integrated with each other.

3.2.3 Impact 3: Requirements for Strategic Options

Companies that have gained excellent response ability have alternatives. The benefit of option stems at least from two aspects: (1) preferential advantages in exploiting the opportunity as opposed to those who might not hold such options (which is what an agile company desires), and (2) increased value by high uncertainty, in which the Agility is rooted. Here, knowledge generation and development is not enough; knowledge needs to be used - also on an interdisciplinary basis - and enriched for scenarios as well as deposited for potential options.

Options are created through enhancements to the reach and richness of a company's knowledge. However, these kinds of knowledge often become embedded not only in documents or repositories but also in organizational routines, processes, practices and norms [DP00]. Both systematic processes and communities/groups/networks are a source of this richness. Moreover, Agility requires a risk-oriented IT capability, which helps organizations to survive in the uncertainty of the operating environment. Companies can exercise IT-enabled options to prevent, avoid, recognize and override risks. This is the reason why a company's data centre is usually duplicated.

3.3 Towards an Agility Framework

The impact (the three knowledge-oriented competencies) of Agility that KM receives can stem from every dimension of a company. The reason of these competency needs is simple and has its clear logic: business has to be able to rapidly sense, respond to changes and be well-prepared to seize opportunities due to the changes. Consequently, each dimension of business requires respective knowledge to stay proactive and reactive. Based on the research work, a KM Agility framework is developed for managing Agility as illustrated in Figure 3.

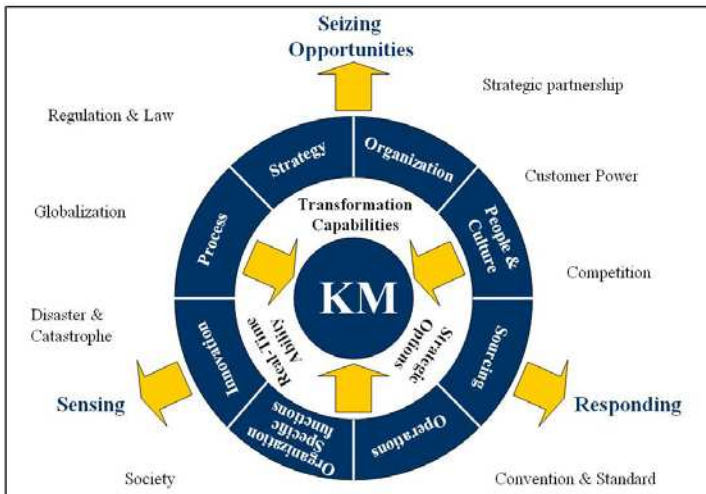


Figure 3: Agility Framework (Source: Own Representation)

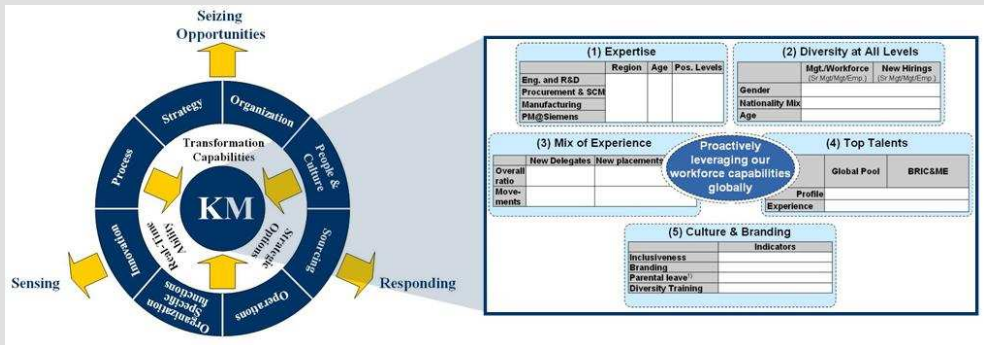
The number, direction, speed, strength and lifecycle of the influence flow (yellow arrows) are set by other parameters, e.g. organizational behaviors, external (country -) and internal (business-) culture, information “damping” and “delay” coefficients etc. As shown in Figure 3, managing Agility needs a clear distinction of elements at each management level: Causal factors, dimensions of Agility, and knowledge oriented competencies. Analysis on causal factors helps management to understand the challenge and to establish strategies. Determination of the dimensions of Agility facilitates categorizing business demand KM. Proactive competencies assume a well-equipped KM as the core of Agility.

Applying KM-Agility Framework in an interdisciplinary context

KNOWLEDGE MANGEMNT AT THE GLOBAL DIVERSITY INITIATIVE OF SIEMENS

Siemens **sensed** the challenges of global mega-trends and the increased importance of diverse stakeholders. Demographic change shows that many countries are facing an aging society and that 83% of the global talent pool consists of women or multicultural individuals [HLS08]. **Responding** to these trends, Siemens launched its Global Diversity Initiative in November 2008, making the company stronger in its global market, localizing leadership and the value chain, to rapidly **seize opportunities** and broaden the diverse talent pool, simply put, and being more adaptive and agile in local market places.

Within the first 3 months, Siemens managed to set up a team and developed the diversity strategy. From the very beginning, the diversity team had identified **KM as one of its key internal competencies** and so measured its diversity status, accelerated evaluation for decision making and transformed culture by embedding Diversity into the company’s systems. The core is the Diversity Scorecard, measuring 5 categories: Expertise, Experience Mix, Diversity@All Levels, Diverse Talent Pipeline and Culture & Brand.



It was a challenging subject and interdisciplinary, applying KM to connect IT and HR for the purpose of knowledge generation and transfer. Since many local and global HR systems had already been in place within Siemens, the challenge was rather how to ensure global employee data rapidly translated into diversity knowledge. The diversity team consistently defined diversity-related indicators, data structure and processes. The IT architecture has a four-layer structure: local HR systems in countries for operations, the Corporate Human Capital System for global key employee management data, the Global Personnel Information System for global HR statistic purpose and the Diversity Scorecard for global diversity measurement. Today, the company can evaluate diversity of its 400.000 employees

over 190 countries and talent composition within several hours. This is a near **real-time ability**, a competency rapidly giving customized diversity credentials for management presentations, government project tender preparation to beat competitors or reports for applying external rankings etc. However, the Siemens example is chosen rather to illustrate the other two knowledge-oriented competencies for Agility.

The major part of the Diversity Scorecard has been embedded into the company's key management positions succession planning and the Strategic Plan Book. This Plan Book is reviewed yearly by the top management and enables great transparency on diverse management teams, talent pipelines and workforce. Placements and workforce planning can be more easily **adapted** in case the business needs to **transform** its strategy to tap different markets or serve different customers. Additionally, the diversity team also established an online library, the DKC (Diversity Knowledge Centre) which archives internal and external reports, studies and documents and shares selected content with colleagues from other departments and country sub companies.

Since the regional companies operate in different legal and business environments, diversity programs vary country by country. Governments and customers have different requirements on companies' diversity effort. The Diversity Scorecard was designed as a strategic framework and can be customized according to local situation. For example, the diversity program in South West Europe is more focused on gender and Talent Development, while the US focuses other dimensions such as Minorities and Networks. The concept provides **different options** for them to measure their diversity efforts. From the external point of view, there is a company-wide competency which addresses the respective regional needs.

The company-wide Diversity Measurement and DKC systems bridge HR and IT, enable the rapid exchange of global and local Diversity-related knowledge. This helps accelerate the company's internal and external communication as well as proactively prepare necessary activities.

Box 3: An example of applying Agility Framework (Source: Chief Diversity Office at Siemens)

5 Summary and outlook for further research

The core of this research work was identification of the three key competencies to achieving organization's Agility: Real-Time Ability, Transformation Capability and Strategic Options, and proving the concept in practice. The Siemens example has applied this concept as an effective toolkit. Future research may also focus on each of the three knowledge-oriented competencies, especially the real-time ability, since the example of Siemens AG was selected for management aspect, emphasizing transformation capability and strategic option. Furthermore, the impact of Agility on KM can be different in "knowledge-intensive" companies, especially those requires high speed of operation or reaction to customers, e.g. in finance, IT or commodity industries. In order to gain more insight into those areas, future work could also aim at the companies' operations in areas of the primary value chain as well as references IT strategies and decision making processes.

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