Theme of exam elaboration:

# "Investigation for synergy effects and preconditions in merging quality assurance-systems, shown on the example of software requirements management"

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## (a) Abstract

This exam elaboration is about merging scenarios as they are found in the situation of a company merger or an acquisition.

Its intention is to give a broad overview of the variety of different sights, perspectives and point-of-views appearing in such a scenario. As far as I have found out, there are quite a lot of mergers on the one hand, but nobody knows how to *do* a merger on the other hand. Concretely, there are pretty few guidelines, general recommendations, or even *how-to*'s dealing with mergers.
And there is no agreement among experts [d3] whether postmerger effects like "synergy" may be expected or not.

So I tried to collect as much information as possible about this subject. The intention is to fill the gap of information and provide a "first approach" to merging scenarios for those who need to deal with this.

Experts often differ in their opinions, but sometimes they share a certain point of view or even their complete expertise. Both different and shared opinions are pointed out in this elaboration.

Later, the findings are concretely combined with the results from requirements investigations with the purpose to prescribe a better approach to mergers. This improved approach results from the risk analyzing activities as postulated by the Evolutionary Spiral Process (=: ESP) and the perspective to knowledge management (=: KM) integraton as synergy effect, devoted to the merger process itself. In case integration succeeds *across disciplines* (including quality assurance (=: QA), KM, and so on), the synergy exploitation is even higher.

## (b) Declaration

Hiermit versichere ich, daß die vorgelegte Diplomarbeit selbständig verfaßt und noch nicht anderweitig zu Prüfungszwecken vorgelegt wurde.

Darüberhinaus sind alle benutzten Quellen angegeben und sowohl wörtliche als auch sinngemäße Zitate als solche gekennzeichnet.

Gerbrunn, den 21. 05. 2001: .....

## (c) Words of thanks

*"... to accomplish together what they could not accomplish seperately"*[r2].

I like to thank all of the people whose help and assistance allowed this elaboration to evolve. This is Prof. Heinz-Jürgen Spielmann in the first place, whose attendance and advice was precondition for me to start my fascinating investigations. At the same time, I like to thank my attendants at Lucent Technologies, Dr. Wolfgang Weidner, Walter Weigand and especially Dr. Stefan Winkler. All the expertise of named persons emerged as very helpful and supported me through times of chaos.

In the next place I like to thank Ms. Alexandra Reed Lajoux in a very special way. Her unique support (in book and eMail) enabled my broad over-view across merger and acquisition (=: M&A) business and became one of the most important elements of this elaboration. I hope to have the chance to thank her in person, someday.

Moreover I need to mention the people at the record-offices that supported me from a very practical point-of-view. These are explicitly Ms. Alexandra Nelles (Lucent Technologies), Ms. Heinen, Ms. Meserasch and Mr. Tesch (FIZBW). Thanks a lot!

For general support and encouragement I like to thank Mr. Lars Willer (Lucent Technologies), my brother Tobias Viertel, Anja Fritzsche, Beate Bastian, Mechthild Hessdörfer and last but not least: my wife Henrike. These are the people that calmed me down when nobody else could. Without theit encouragement I would have gone *"slightly mad"* (*Queen, 1991*).
A special "thank you" goes also to my former colleagues at Automotive Products: Financial Controller Mr. David Horne (GB) and the Unix genius Mr. Gerry Cevat (NL). In retrospect I am sure that these two people contributed tolerance and integrative thinking to my personality.

Finally I like to mention those people who supported my efforts for a "correct" English. These are the people from TU München @ http://dict.leo.org/ and Christiane Mund. Especially her endless patience concerning my individual interpretation of English grammar and vocabulary must be mentioned explicitly. In case you find remaining mistakes of linguistic kind, it is not her fault but mine due to the fact that I was working on this document until the last hours pre delivery date.

This document would not have been completed without your support!

**(d) ToC:**

## (e) Images & Tables

# 1. Introduction

"When you can measure what you are speaking about and express it in numbers,
you know something about it;
but when you cannot measure it, when you cannot express it in numbers,
your knowledge is of meagre and unsatisfactory kind." (Lord Kelvin)

## 1.1. Personal Motivation

When Persian king Hammurabi in 1600 b.c. founded the discipline of Quality Assurance (=: QA), his system was based upon punishment. Although punishment is evaluated as an education instrument of improper kind by today's scholars, his system showed the need for consequence:

"IF <done_wrong> THEN <consequence>"

But prior to punishing anybody at all, Hammurabi needed to develop and communicate his criteria for what he evaluated as *wrong*. So he considered all the different topics he wanted to assure quality in and wrote them down in the famous "Hammurabi Stele". His written law now became central access and provided always the same information for everybody honestly seeking. To give an impression, one of his most famous rules is translated and quoted as follows:

> "**§ 229**: If a carpenter has erected a poorly constructed house, so that the walls cave in and kill the homeowner, that carpenter shall be executed."

This quote points out the IF-THEN-structure all computer scientists know so well these days in a *clear* and *distinct* way. To prevent his execution, the carpenter simply needed to ensure a robust and safe workpiece, *which is nothing but his own job*. From the more abstract point-of-view one could say. Hammurabi simply *endeavored to avoid failures* in his realm and ensure quality work instead. In retrospection, this became the natal hour of the discipline we call QA today.

However, when Christian religion conquered Europe approx. 2000 years later, the question of "*how to assure correctness*" was no longer important. As proven by Christian Inquisition for a thousand years (851 a.c. - 1859 a.c.), the question of "*are you of right belief*" became the crucial question on peoples' minds. Nobody was interested whether the findings of, for instance, Galileo, Copernikus or Keppler where in fact correct. Moreover uncounted researchers have been sentenced to death for their findings due to nothing else but their "*wrong*" belief. Fortunately, the question of believing is no longer important anymore and the meaning of quality is re-entering peoples' mind again.

One of the most important aspects of quality is transparency, resulting for instance from a comprehensible presentation. Transperency is evaluated as basis for any kind of successful communication: only if every communication partner has the same knowledge or insight into the discussed topic, the amount of belived and ambiguous opinions can decrease for the sake of knowledge. Knowing the subjects is the indispensable basis for achieving quality in this subjects. Only understood topics can be measured and measurement is indispensable in the discipline of QA itself.

## 1.2. Integration

As multiple records show unquestionably: Mergers and acquisitions, hostile takeovers and friendly amalgamations today are thousandfoldly performed every year and all over the world. They are a manifestation of our times and are expected to guide our future for a few further decades, as international experts [d2] agree. The merging entities in question are companies, authorities or even complete countries, while the aspired goal is always the same, wearing a thousand different faces: It is the desire to "accomplish together what they could not accomplish seperately" [r2].

The *trend* of uniting discrete entities into a completely new one is relatively new. Although giant enterprises like General Electric started integration activities quite a long time ago, the preceding trend was *diversification* as counterpart to actual *integration* as "accomplishing method". While the first trend followed the idea of further specialization of what has been identified as insufficient, the latter evolved directly from its resulting, major problem: exploding **complexity**, as illustrated below:

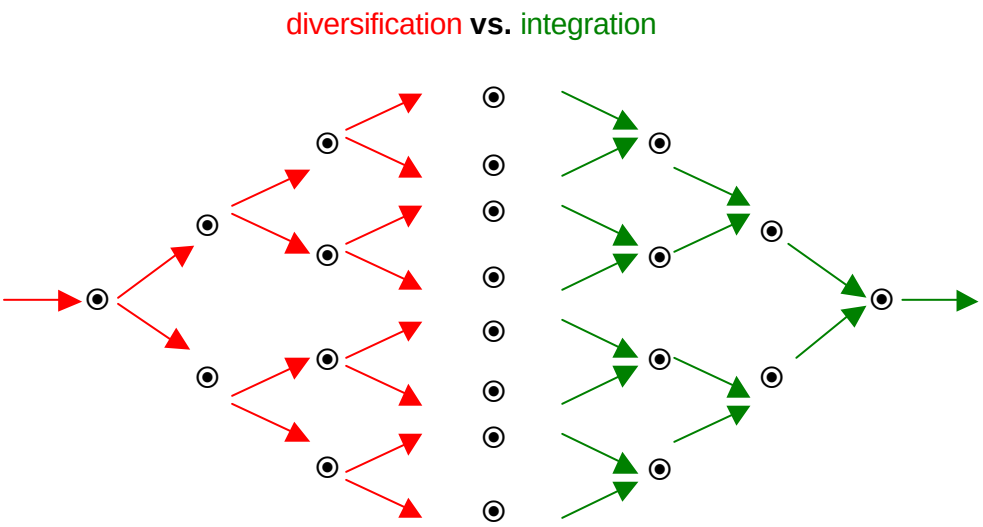



Image 1: Diversification vs. integration

Today scientists understand that knowledge is no means in itself but a *tool*, necessary to solve given problems. Without any doubt tools need to be administrated and practiced. To achieve this goal, any existing base of knowledge needs to have interfaces to and from the outside to guarantee the *ability* for new knowledge to enter the (already existing) system. Then, the new knowledge needs to be integrated into the previously existing one. It makes no difference whether the integration entity is new knowledge, a new process or even a complete company due to the fact that knowledge must be evaluated as kind of common denominator to *all* the stated entities. This submits the following over-all structure to **integration** (=: ⊙) in general:

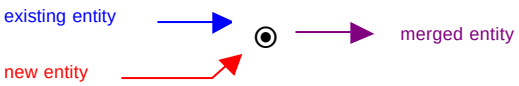



Image 2: Merging entities

Due to the fact that integration and its merger process(es) are introduced more detailed in the following subsequent chapter, it is time to jump back to the actual flood of mergers within M&A business. While the high figure of announced and ongoing mergers supports the idea that integration is a necessity of our times, one might guess that there is a huge number of experience and advice available, describing the particular needs and considerations one needs to know before starting integration. Surprisingly, there is not. But understanding the reason is quite simple: most of the performed mergers simply fail [d7]. So the knowledge of *how to* perform a merger is still a well-covered book-of-secrets. The resulting purpose for the elaboration at hand is to uncover this process of integration by *using and stating* a structured approach to the experience available.

# 2. Overview

"Is simplicity best — or simply the easiest?" (Depeche Mode, 1993)

Prior to presenting the results of my research, I have to introduce you to this elaboration's structure and the broad scope of M&A. Unfortunately, the complexity of the latter is tremendous so I decided to extract some common considerations management needs to deal with before deciding a way through the forthcoming integration and its tremendous amount of sub-processes.

## 2.1. Structure

To enable a preferably *easy access* to the information coded within this elaboration, I chose the top-down-approach: Each section starts by giving an overview about the topic in discussion, followed by pointing out related topics and / or alternatives if existing. In this case, this listing is followed by evulation before closing the section by summary.

| Structure of approach: |
|---|
| 1. Mini-overview |
| 2. List of related topics and alternatives |
| 3. Evaluation and rating |
| 4. Summary |

Table 1: Chosen structure

Sometimes related topics are mentioned although their scope must be evaluated as "too far away" from this elaboration's core research stream(s). The purpose, then, is to mention and thus *stress* their existence. This will make the overview appear *more* complete for this reason without declaring it to be entire at the same time. In addition, this provides a broader basis for individual understanding and thus supports the process of mastering arising complexity as illustrated in the subsequent image, referring to above-mentioned table.

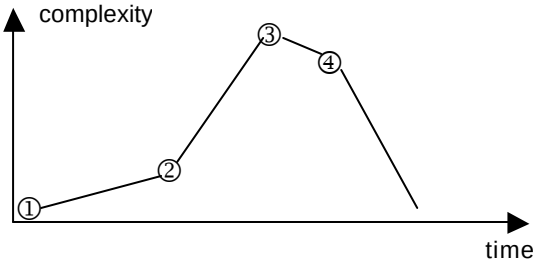



Image 3: Complexity over time

By reading the first books and studies concerning M&A, it soon became obvious that its scope is extremely broad and fuzzy. The only book trying to investigate the over-all subject of M&A is "The Art of M&A Integration", written by A. Lajoux. Her degree in Comparing

Literature provided a *merged* overview about the subject of merging[1]. Fortunately this book has the ability to make oneself feel more sensivitive for the complexity of the subject of integration, summarized in her statement that "the record shows that unless merging companies master *the fine art* of post-merger integration, the chance of future sucess is low" [r2]. The elaboration at hand intends to show at least the most significant and rudimentary constituent parts of that *fine art*.

A second impression soon arose from the individual focus of the other studies. While each had its own scope, non of them provided approach to the problematic nature of integration in general: To give an idea, some articles' focus was on resources and / or processes, others dealt with the subject of control and quality. Some studies referred to shareholder concerns while others presented specific suggestions, solutions and even "how to's" for *a part* of the broad subject of integration. Others dealt with highly specialized subjects like prices too specially and had to be excluded from this elaboration.

Moreover, while seeking out information related to quality and software (=: SW) requirements, the following structure evolved. Although M&A is seen as a *trend* by many experts, the information available is still "close to zero" [r2]. Unfortunately this is especially true for the concrete subject of merging quality management systems (=: QMS). Thinking about all those actual company mergers I felt secure about my hypothesis that at least *some* of those merging firms *must have had* a QMS prior merging. If so, the merging operators needed to think about the future of their QMS(s). But although I *assumed* the existence of these informations, nothing could be found documented — at least accessible for the public.

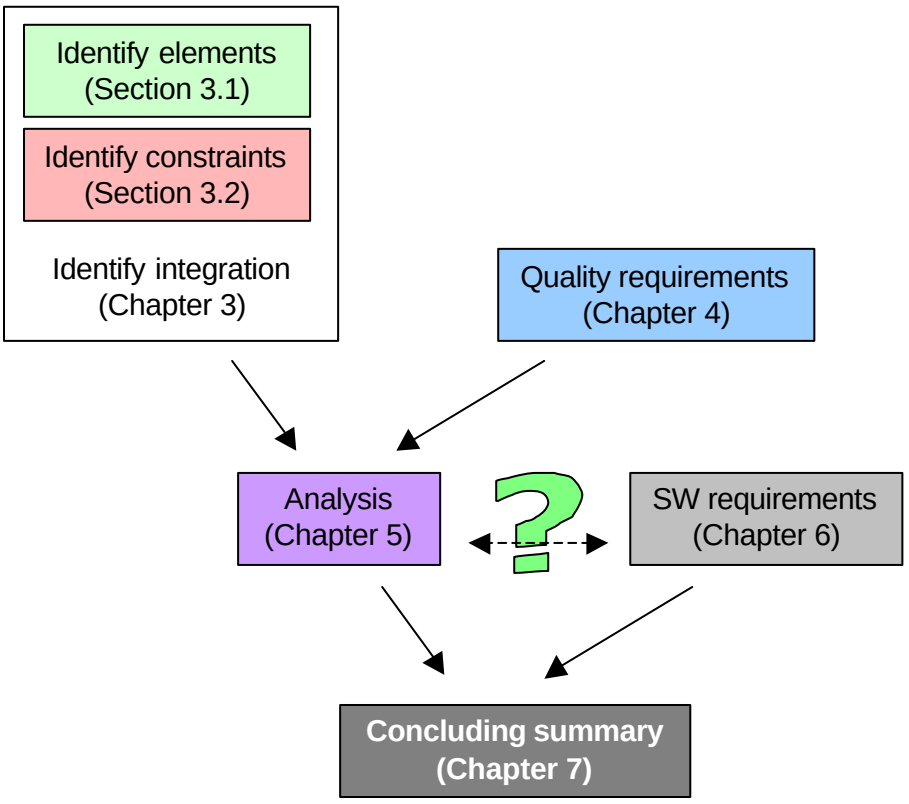



Image 4: Elaboration's structure

[1] please notice the closed relationship of the terms *comparing* and *merging*.

## 2.2. Terms and definitions

"Unity is plural, and, at a minimum, is two." (Richard Buckminster Fuller, *Synergetics*)

But prior to dealing with the merger problem, other topics need to be adverted. The starting off is done by the multitude of different and similar terms. The found variety imperatively needs further concern before using —partly contradictory— defined terms. For this reason, it is necessary to understand that I use the term 'merger' as representing *activities* to undertake, while the term 'integration' stresses the affected *operations* of the two companies to be united. Please keep in mind that other studies may use the same terms, assigned to different interpretations.

Nevertheless, both of these terms refer to a quite *close* relationship between involved entities. The alternatives are relationships of a *looser* kind like a joint-venture or an alliance, where entities are *not* desired to form a new unit. This kind of relationship is of lower importance concerning my elaboration and basically excluded from it for this reason.

But there are differences from more than just the technical or relationship point-of-view: The *motivation* for merger decisions highly differ from each another: While some enterprises only want to buy a certain competitor to erase him from the market, others want to obtain the competitor's letter-of-patent, for instance. Some want to follow their dream of expansion in using a different company's distribution channels or globalized service stations already spread all over the world. But this is not my subject, too, and is thereforee mentioned only briefly.

Although all acquisitions have the same purpose, each integration looks different. There are not two acquisitions with the same integration process. This is, of course, strong evidence for every integration process to be evaluated as highly individual on the one hand and determinant of the new enterprises' future on the other. These two characteristics are the reason why integration experts to talk about this process as *a fine art*.

Nevertheless, terms in this elaboration need the following interpretation:

| Distinction of major terms: |
|---|
| 1. Acquisition:<br>Refers to both mergers and acquisitions of organizations. The differences are legal and financial and have little affect on the combining of *processes*. |
| 2. Integration:<br>Refers to the post-acquisition process of combining the operations of the two companies.<br>(Associative activity may be *identifying the subjects for integration and their dependencies*) |
| 3. Merger:<br>Refers to the process of combining the processes from a technical point-of-view.<br>(Associative verbs may be *melting* and *uniting*) |

Table 2: Terms

Please note that these terms may occur in other studies, too, but might need a different interpretation there. To show an example of alternative interpretation, the term *merger* can

refer to the inter-relationship of both companies, stressing that both companies are truly accepted *partners* ("going together"), while the *intergration* term refers to a big, mighty company, into which a smaller, less powerful unit is integrated ("assimilate" or "embody").

Finally I like to close this section by presenting chosen typographic definitions:

| | | |
|---|---|---|
| serif font | [ | general presentation of information |
| *italic font* | [ | linguistic emphasis |
| **bold font** | [ | content-related emphasis |
| <...> | [ | mnemonic processes or references |
| [d<number>] | [ | definition <number> (section 9.2.) |
| [r<number>] | [ | reference <number> (section 9.4.) |
| underlined | [ | hyperlink |

## 2.3. Merger and acquisition

*"For most companies it makes sense to be entirely global in some respects and regional in others."* [r2]

It is hardly possible for me to provide an entire overview concerning the broad subject of M&A integration. The reasons are plenty and inter-connected among the diverse schools of research streams. This scenario appears to evolve problematic at first glance but enables a serious approach on the other hand by presenting peculiar M&A concerns.

As I already hinted in the preceding section, meaning and interpretation of used **terms** vary between the diverse streams of research as well as among authors of the same research stream. So it is close at hand that, for instance, using the term *integration* is ambiguous in its interpretation — unless clearly defined. This becomes even more problematic when taking into considerations that *most* studies avoid to define the terms they use *completely*.

The next problem, explicitly mentioned in several studies, is the "lack of **comparable** data" [r2] [r4], providing problems of general kind: Analysts can decide whether to use exactly the same data and measurement criteria on the one hand or produce another unique study on the other. Unfortunately the first option is of a theoretical kind only due to the individual character of each integration as extracted within elaboration in hand. In consequence, most of the studies' results are either "unique" [r11] or "not transferable" [r32]. Dealing with the analysed and evaluated data of especially older studies, *methological problems* lead to interpretational difficulties [r26] in addition.

The origin for this problem directly arose from the traditional way of investigation. While each of the four major **streams of research** [r11] has its own focus and concern, there is no *integrative* research stream to provide a first step over-all approach[2].

[2] one of the (very few) exceptions to the rule is to be found in Lajoux [r2].

| Traditional M&A research streams: |
| --- |
| ‣ Financial economics |
| ‣ Strategic management |
| ‣ Organizational behavior |
| ‣ Process perspective |

Table 3: The major research streams

Especially the school of financial economics can be evaluated as problematic. Studies out of this periphery often examine the equity growth or shrink to evaluate the merger success. Of course, they can *measure* the resulting delta as either positive, negative or neutral, but cannot determine the *reason* for this growth or shrink, which is the interesting question of this investigation. Some studies do not shun to declare that stock prices can result from *anticipation* of economic gain or that equity value gains "could also be due to capital market *inefficiencies*, arising simply from the creation of an *overvalued security*". In short, "no stock price study provides evidence on *sources* of merger-related gains." [r26]

However, the upcoming question is concerning the subject of **success evaluation**: If there is little statement about the *reasons* for altered equity value, how can *any* success of a merger be evaluated at all? Well, this is a crucial and still unsolved problem in M&A business, affecting *all* the different streams of research. And so, neither success [d5] nor failure [d7] is clearly defined today. Moreover, when some "unsuccessful takeovers"-analysts declare that their studies are unable to distinguish between real gains and market inefficiency explanations [r26] they show out the boundaries of measurement in general. Whith a little luck, these boundaries remind us on the introducing statement by Lord Kelvin and helps to provide a better basis for evaluations in future: '*hard*' knowledge can be distinguished from '*soft*' knowledge, for instance. While the first refers to observed facts, the second is built upon individual feelings, opinions and estimations. Even *believed* facts could enter a system of evaluation in case *soft* knowledge is allowed to enter this system, too. In a second step, this could provide basis for integrating experience afterwards.

Finally, it is inevitable to point out that experts even cannot agree on the **result** that must (or can) be expected from a merger decision: The standard *Cournot Model* holds the opinion that merger participants strengthen their market power by decreasing '*output*' and increasing prices. Consequently the competitors increase their '*output*' and decrease their prices in addition to remain competitive. The over-all result is *enhanced* competition. This phenomenon is named '*merger paradox*' [r24] to point out that the desire to "accomplish together what they could not accomplish seperately" may lead to a market scenario where the merged company is no longer able to accomplish anything at all: the strengthened market position of competitors may evolve to an unchallengeable challenge for the arising company and its structural challenges. So, who does profit from the merger in the end? As a matter of fact, no generalized statement can answer this question.

Hopefully you get a first idea about the fact that one of the most frequent stated declarations concerning M&A sounds like this: "the integration-process can be a problem" [r12]. The ambiguous approach to integration often results from the ambiguity related to the nature of integration in general. While management often *decides* a particular merger, the intended goal remains undefined. Especially how resources and plans are intended to support the impending integration remains unconsidered. The resulting opaque situation of the complete

enterprise endangers its future but makes also clear in a distinct way that this fog must recede for the sake of clear and unambiguous knowledge, based upon transparency instead.

When intending a merger, it is good to know in the first place (and quite easy to understand), that the strongest improvement arises from mergers with **highly overlapping core business** [r26]. Significant gains have been detected in *operating synergies*, *tax saving*, *employee transfer*, *stakeholder transfer* and *increased monopoly rents*, for instance.

In case top-management holds the opinion that a impending merger is inevitable but fears the structural changes both enterprises need to undertake within the processes of integration, it may be helpful to know about existing **alternatives** to mergers. Here, the dangerous business of M&A integration can be avoided completely. Actual studies support the idea that "global mega-fusions" are constraining by way of exception, only. This is especially true from the economy point-of-view. And of course, there are various alternatives [r60], while the *ability* of finding these alternatives reflects the decision-making culture in top-management. Instead of uniting the entities by *'melting'* them, which is an energy-intensive activity anyway, there is the alternative of *'linking'* them. Due to the high complexity of mergers and the fact that every merger is of highly individual character, all the alternatives of the latter kind cannot be listed here. But the scope ranges from joint-ventures to alliances, while the latter is introduced briefly:

A special study I found dealt with the question whether alliances are preferable to an acquisition [r9]. There it is stated that "alliances make it possible to enter new markets using the distribution networks and the specific knowledge of local partners." If the motivation for a (corporate) merger decision is explained by distribution networks, an alliance might provide sooner and faster exploitation of these synergies, for instance. The advantages are close at hand: less time and effort have to be put into learning and building up a common culture — one of the most critical processes of a merger. Companies can focus their resources on enhancing their core competences instead. This is, of course, a vital vantage in times were "business moves @ the Speed of Thought" [r4].

Another aspect concerning the choice between alliance and acquisition is identified in the research- and development (=: R&D) environment, where an *inverse relationship* between R&D intensity and acquisition activity is extracted. The recommended strategy is partially specializing in one of these two models at least: "internal R&D or acquisitions, for survival and growth." [r29] And, of course, this decision is influenced by the companies' culture, too.

Refering to culture, an alliance is limited to *exchange* in general. Its intention is not to *unite*, which is (more or less) the driving idea behind acquisitions[3]. A good alliance is based on complementary capabilities and resources. Partners evaluate each other as counterpart to pursue "business opportunities that neither partner could pursue alone" [r9]. This is an easy approach for exploiting synergies and thereforee to create value from inter-relationship.

Although this sounds quite good, it is important to notice that most of the alliances do not match this pattern, especially not in Europe. Nevertheless, the major characteristics of alliances look like follows:

[3] of course there are multiple examples showing different ideas of acquisitions (ie. takeovers of hostile, raid or rescue kind, ...) which are not worth viewing, here.

| Characteristics of alliances: |
|---|
| 1. All decisions must be made by consensus among the partner firms |
| 2. Alliances are transient in nature and must remain reversible |

Table 4: Over-all characteristics of alliances.

The introduced study is evaluating alliances not as alternatives to acquisitions in general, but as a *first step* towards a merger. The hope is to avoid one of the major *pitfalls* in acquisitions, the post-merger integration process [r10]. Alliances enable the avoiding of "*cultural and organizational shock*" [r9] and diminish it for the sake of a *step-by-step* proceeding.

Nevertheless, "strategic alliances have long been a tradition in European business" [r9]. To give an example, the 'Concorde' would not have been developed in 1962 by the "British Aircraft Corporation" and the "Sud Aviation" (France) without their alliance.

But in addition to concerns and constraints as arising from an intended acquisition, there are challenges and benefits than can be expected as merger outcome, too. To make a merger successful, merging operators [d1] are often encouraged to reach this goal by exploiting **synergies**. But what sounds logic and feasible at first glance is soon identified as the major problem of "the fine art of post-merger integration" [r2]. But if undertaken seriously under aspects of quality, this long-term success is feasible.

Refering to **quality**, then, this is assumed to be "the difference that makes the difference". And this is one of the most important aspects, where integration approach differs highly individually. The following image will help to understand three basic merger scenarios, arising from the questions for quality management systems (=: QMS):

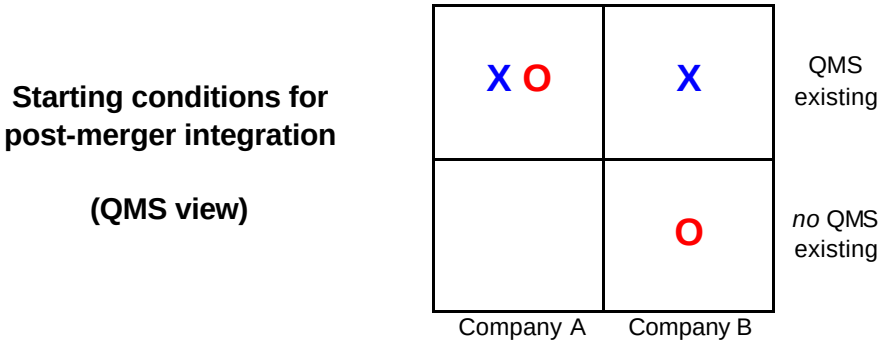



Image 5: Merging quality objectives

By distinguishing the **X**'- from the **O**'-scenario, this is easy to visualize. While one might suggest to investigate a possible existing *common denominator* of the existing QMS in the **X** case, this approach is completely inapplicable to the **O** case due to a one-sided lack of merging entities. But even a common denominator can be difficult to identify. While each company might use its own traditional framework, the desired framework compliance *after* the merger might be a third one. Which common denominator is to recommend then? Please take a look at image 17 ("The frameworks' quagmire") to understand the crucial nature of this problem.

So the overview suggested the existence of either constraints and challenges as arising from the broad surrounding of M&A. Thus, the decision for a merger, the way it should be performed and who's contribution is to be identified as elemental should be thought over and be discussed very carefully and on a preferably broad participation. Once decided, the way back is —if ever possible— destroying resources a second time.

# 3. Integration

*"A merger provides a window of opportunity when change is expected and accepted. Push everything through that window that you can."* *Sir Adrian Cadbury (1996).*

It soon became conspicuous that lots of studies dealt with the subject of **processes** when monitoring or evaluating a merger. They are identified by a multitude of studies and tenets from theoretical as well as from practical approach (or school) to be of crucial importance in a (post-merger) integration scenario. Due to the fact that the process of integrating processes (= *merging*) is a process in itself, there is a high inter-relationship between the merging process and the way, the companies' processes can look alike after[4] the merger is over. One imaginable output of the process of merging processes can be a common organizational standard process, the OSP. This threefold role of processes within a mergier scenario has the ability to reform the structure and the future of the enterprise at merger output side. Nevertheless, the process approach is of a more traditional kind today. Lots of studies point out that simply merging existing processes is not enough. Merging the resonsibilities, the human individuals and the company culture is of the same importance in the least:

Especially **human resources**, as one of the intangible assets of any company, need to be merged under particular precaution. Humans need to get familiar to their new counterparts, establishing a confident and reliable working-condition. If taken to self-reliability and self-organization concurrently, humans of both sides together can merge the processes on detail-level: They are the ones operating the(ir) processes, which makes employees most suitable to perform the merger on detail-level. In addition, this will be helpful in identifying synergies — if management encourages them to do so. This directly leads to a third aspect of my findings:

**Responsibilities** are strictly forbidden to be left unmerged and / or re-designed. Together with the aspect of a company **culture**, the four bold terms provide the scope for basic —but common— merging activities.

After presenting this four (and two further) scopes for integration in the following section 3.1, I deal with probably existing preconditions and the question of *how-to* unite the elements of integration. For this reason, section 3.2. can be seen as the most practical part of the elaboration in hands. All the different approaches concerning different aspects of integration and merging are mentioned, so this section can also be seen as a kind of *tool-box* providing practical expertise and help. Please notice that lots of the articles, studies and books I found are just a few years old. Presented information must be evaluated as *contemporary* for this reason.

[4] the merger must not end — it also can evolve to a basis for continual improvement.

## 3.1. Elements of integration

The following sub-sections present my findings from all kind of relevant journals and articles, affecting the elements of integration processes. From this point-of-view, this section presents an *actual* and *broad overview* about the most important and common elements devoted to integration. Nevertheless, this overview may be incomplete and can only provide a *first approach* for this reason. It is inevitable for merging operators to go through the complete companies that are intended to be merged and perform a complete stock-taking concerning the four basic elements I previously mentioned. As one possible result, further specific elements may be detected.

### 3.1.1. Resources

*"The impact of human integration on acquisition success is more complex than usually suggested."*[r11]

Of course there are two different kinds of resources to be integrated: intangible and tangible resources. Refering to the M&A business, intangible resources are represented by *human* resources in particular, while tangible resources equal the classical ones. While the latter are mentioned in sub-section 3.1.1.2. briefly, the intangible human resources (=: HR) are the most crucial resources within integration concerns: Individuals act unforeseeable. This aspect of integration has been neglected long enough but actually enters M&A business. I will mention some studies from actual management journals dealing with nothing else but the fragile topic of human integration.

But the process of HR integration cannot be done isolated. One study is built around the fundamental observation that the integration process involves (a) task integration and (b) human integration[r11]. Of course, these two sub-integration processes can be "understood seperately"[r11], but never *done* isolated from the other. When people get to know their counterparts, this is the best point-in-time to encourage employees to re-structure business processes in self-dependence. They were the experts handling these processes in the past. Their interest is high to ensure they still are in the future.

Since experts do agree that both processes and humans need to be merged, I took this advice and created a section for each, starting with the human side. These two aspects will be supplemented by dealing with responsibilities and the enterprise's culture afterwards.

#### 3.1.1.1. Human resources

*"Nur wer das Ziel kennt, erahnt einen Weg"* *Tanzwut, "Labyrinth" (2000)*

Without any doubt, HR is one of the intangible assets being hard to evaluate. On the other hand there is broad agreement that HR are one of the most valuable resources concerning *technical expertise* and *client relationship*, for instance [r8]. In times where highly specialized employees often are millionaires [r65] themselves, it becomes obvious that money is not the only means for superiors to express employees' esteem. Companies need to realize that they must offer more than just adequate salary to keep employees or they will loose their most valueable resources to global competitors that already do. Paying respect to the importance of *humans* is the reason for me to start with my own species prior dealing with technical aspects of integration.

The introducing quote declares that goals are just providing *ideas* about the future and that results may differ from initiating intention. So goals should not be expected to be realized for a 100% purpose. The reason is easy to understand: While any kind of re-structuring processes alters the whole company's face, the company needs to challenge continuously alternating customer requirements in addition. These influences from the outside may impact the re-structuring process and vice versa. For this reason it is soothing to know that goals are (often?) of a *soft* nature (or quality!) and have no definite character.

Prior to doing *anything*, everybody should have defined the aspired goal. What kind of staff is aspired to retain throughout and post integration? How should HR be handled in general? To give an idea, lat's have a brief look at Goldman Sachs, wich is the premier M&A advising house in Europe. In July 2000 the company received the "Euromoney Award for Excellence 2000" [r3] while the reasons for this accolade are easy to comprehend: the M&A advicer was involved in 45% of all major deals globally, on top in Asia with 70%, on top in Europe with 49,4% and on top in the US with a 40,3% share. This successfull company makes its living by giving advices to merging companies. So what are humans treated like in such a company?

Co-global head of M&A Steven Heller says: "We encourage and reward a culture of teamwork rather than the cultivation of individual superstars" [r3], which is "one of the more obvious ways in which Goldman and nearest rival Morgan Stanley Dean Witter differentiate themselves from competitors". Generalists have the ability to improvise while most of them are open-minded and like to change their sphere of activity [r64]. Heller pays respect to this recognition by stating that " 'Our bankers have spent their careers migrating through various regions and industry groups. That gives us a great mix of talent with a variety of experience across disciplines.' And that will become more important, he says [...]." [r3]

The M&A Advicer Goldman holds the opinion, that teamwork and experience across disciplines are major reasons for the company's success.

This could be an appropriate target for integrated staff. But why is it so hard to achieve? Cognition is not new that a decision made by a team is usually more robust towards failures, errors and missing outs than those built up by 'genuine individuals'. There is a corresponding advice by Lajoux [r2] as there is from various actual management journals like the renowned Harvard Business manager [r37]. The aligned demand is to attribute decisions to teams

instead to individuals. In case merging operators want to achieve this goal, they cannot form teams without respect to the present situation. Otherwise, the merger process can destroy already existing decision-making cultures [r2]. This would, of course, have counterproductive impact on the merger process and the disrupted colleagues.

In a merging process, staff of both of the company need to be brought together. They need guidance and help in undertaking the first steps of approach. Previously unfamiliar colleagues are *forced* to work together although they have never met before. At this point it is important to notice that no designed processes will work, if people won't accept each other. This will lead to disinterest or even sabotage. To be able to work with somebody previously unfamiliar you need to know and accept the person across — and see the things both *share*.

But the problems covering this little word *share* (and especially its verb) seem to be hard in handling prior to the integration phase. In studies by Haspeslagh & Jemison [r5] and Sirower [r6] the statement is made that managers tend to focus on the selection and negotiation phase of a merger and do not spend enough attention on managing the integration phase that follows the closure of the deal. Empson [r4] holds the opinion that there is a possibility to avoid this problem, although she thinks that "firms must recognize how *little power* they have to control the thoughts or actions of their most valuable assets like HR". And there is support for this idea by a different study by Scheck and Kinicki [r7]: "The current results suggest that intervention programs should focus on increasing employees' perceived control, confidence, and self-efficacy about handling the changes associated with an acquisition." These last two statements point out in an unmistakable way that it is about time for management to recognize and accept, that the process of HR-integration is, at least to a significant extent, *not directable*. For this reason, several *individual* coping strategies are detected [r7]: The recognition that individuals choose individually should encourage management to rely on the principle of self-management [r58] as opposed to put effort into the attempt of managing the unmanageable.

So the only way out seems to be found by creating the best possible boundary conditions and circumstances for such a tremendous process like the merger of human resources and hope[5] the best for the rest of it. And there are proposals how to achieve this goal: "At a minimum, management needs to proactively communicate with employees throughout the *transaction process*." In other words: as soon as possible (*"asap"*). The current results demonstrate that "primary appraisal plays an important role in affecting employees' emotions and subsequent coping strategies during the acquisition. Negative appraisals of the acquisition should be discouraged in order to reduce negative emotions." [r7]

And so there are two more ideas worth mention: First, management can only provide a kind of "best kick-off" which is extremely important to know: *If* there is any influence by management in this process, it is right in the beginning! Management can do nothing else but *choose* the way — the *walking* will be done by the employees *themselves*. Even in some public administrations (like in Hamburg, Germany) the recognition came up that "der Mitarbeiter muß selber den Prozeß mitgestalten" [r20]. This is, at least in my eyes, the best way to ensure effective and efficient processes. Nobody *wants* to do more work than necessary! So trust in employees personal interest to work as little and easy as possible. Management needs to understand that their most important job is to provide the necessary *basis*. And the essential *tools*.

[5] If you go along with Murphy's "*if anything can go wrong, it will go wrong*" philosophy, you might be right — but this will not help you with the integration process. Note that the opposite is true instead!

Thus, the integration process is to be found among the employees *themselves*, too. They are the affected 'resources' and need to find an individual approach and an individual way through the merger. It is not enough to *aspire* integration — it must be *done*. To achieve this, and to possibly get feedbacks from the employees like "it was handled very well" or "very professional", it is "necessary to spend lots of time and effort on communication" [r11].
Identifying these three major elements of HR-integration (ie. management, staff and communication) and the ways they are inter-connected leads to the two "how-to's" presented in section 3.2.4. ("Fighting the 'High School-Dance' phenomenon") and section 3.2.6. ("Management impact on human integration").

It is of major importance to realize that "individuals and organizations learn by doing; in the merger process, this is very true." [r2] This is a good point of time to restructure the company as a whole, introducing KM [r66] and / or total quality management (=: TQM) so your company can benefit from the individually adepted experience. If enterprises are re-organized in a clever manner, processes can become thinner and complexity can decrease to become manageable again. As a result, business becomes more effective. A reasoning case study is presented in the article "Kluges Reorganisieren verringert die Komplexität" by C. U. Lott in Harvard Business Manager (1/2001, pp. 20-31) and can be ordered at the mentioned publishing house. To handle the complexity of the process of HR integration, management can introduce the principle of transparency, empower employees with self-management and assure feedback. This could become an appropriate vision, guiding the process of human integration. Sometimes this might become true only if "hand-grenades" are dashed in every conference while management "sets on fire" from above concurrently, as reported in the Harvard Business [r37], for instance. Even traditional principles must be questioned and possibly re-cycled to realize the vision that every multi-functional team is now responsible for the *entire* and *competent* execution of customer-related processes. Large multi-nationals like IBM [r37] chose this way to challenge the future and can now benefit from vanishing struggle.

This sub-section now ends human resources constraints, while the next briefly deals with all the non-human resources. Concerning the integration processes, they are of much lower importance.

#### 3.1.1.2. Other resources

The resources besides HR can be classified in two major streams: financial and tangible resources [r2]. While the first is self-explanatory, the latter needs to be subdivided into the classical resources *land*, *plant*, *inventory* and *equipment* [r2]. Concerning all these resources, the recommendation for integration is to "remove structural impediments" as soon and far as possible. This also includes [r4] brand names, HR management systems and office buildings, for instance. A special focus should accrue information technology (=: IT), where integration should not be delegate to the technical experts without monitoring the IT integration process by management [r2].

In general my impression is that *this* kind of resources is basically uncritical in the integration process. Almost none of the studies dealt with (one of) them to a major extent. The reason may be that these resources do not influence the integration but are influenced by integration in return. Apparently, the chosen way of desired co-laboration —ranging from joint-ventures

over alliances to fusion— determines the degree of desired integration. For this reason, the subject of integrating resources will be closed here to open up the process view of merging.

### 3.1.2. Processes?

Although Processes are identified by several researchers to belong to the **elements** of integration, I decided to assign processes to the "methods" of integration as well. The motivation is easy to understand: Of course, merging operators need to identify already existing processes in both merging entities prior to the merger. The result of this investigation will provide the imput-elements for the merging. But it is worth to notice once again, that the merging process is a process in itself. For this reason, the merging process is an essential part of the integration constraints — especially if there is common advice available *how to* merge processes. So I decided to deal with processes as *element* of integration and as *method*. While one "output" of the merger process is the merged entity, a second output could be a standard process for the future company. This second output would, of course, prescribe the company's wish to exploit learning effects as merger benefit.

As investigations made clear it is *possible* for management to think over a kind of standard process. This organizational standard process (=: OSP) could benefit from the research- and merge activities mentioned above. If all existing processes are identified, the common attributes could be generalized to enter this OSP. It could act as a "father" and hand down the main- or general attributes (and structure) to all derived son-processes. This would generalize the way of handling processes in future and reduce complexity once again.

The desired and recommended standard characteristics an OSP should show can be found in section 4.5.3. ("Desired characteristics for the Organizational Standard Process")

#### 3.1.2.1. Excursus: Nature of (business-) processes

Just to provide a common insight into the minimum components of a basic process, take a look at the enclosed illustration. Please notice, that this visualization only meets *my* personal requirements and I must point out expressively that there are as many interpretations and definitions of 'process' as there are schools dealing with it.

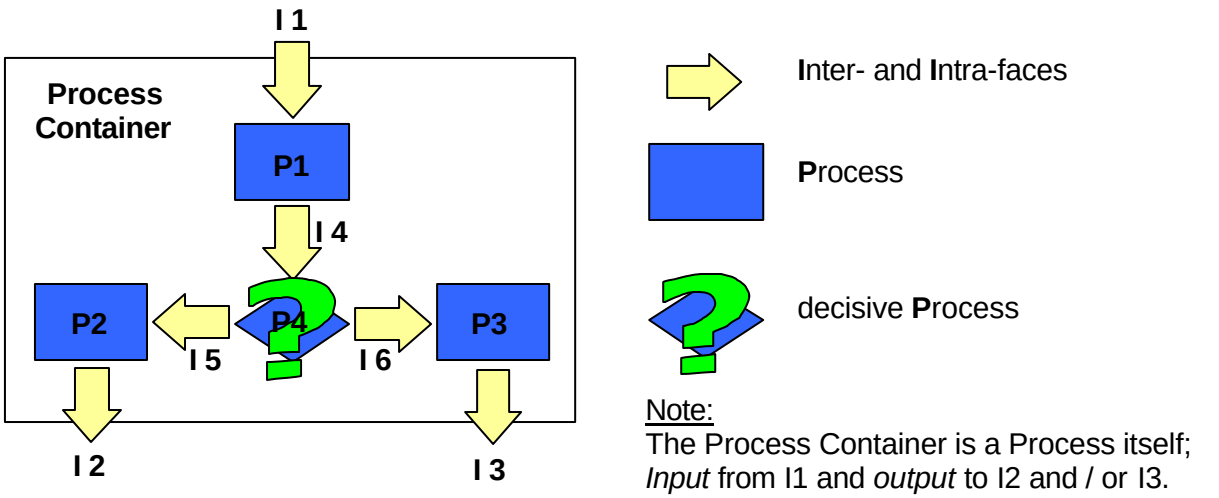



Image 6: A decisive process

According to ISO definition [r40], a process is a "set of interrelated and interacting activities which transforms inputs to outputs" which referrs to the Process Container including the first three interfaces I1 to I3. This is not much but at least a good and common start. Following my illustration, one might easily agree that a change within sub-Process P4 will also have an impact to the Process Container, a Super-Process of P1 to P4. This pays respect to the terms 'interrelated' and 'interacting' used in ISO definition. Other publications point out different elements for different approaches like Harrington [r43] does. He starts by taking a note of the interrelationship between the terms *process* and *product*: "There is no product and / or service without a process. Likewise, there is no process without a product or service." This interrelationship is bi-directional:

Product ⇆ Process

ISO definition, for instance, substantially differs from this: a product is defined as "*result* of a process", what makes the interrelationship of both terms uni-directional:

Process → Product

Please imagine a manufactory where *defect products* start an automated *verification process* and you understand the reason for rejecting ISO definition to use Harrington's instead. He defines a process as "any activity or group of activities that takes an input, adds value to it, and provides an output to an internal or external customer. Processes use an organization's resources to provide definitive results." In section 3.2.8. ("Value Chains locate synergy") you will understand the reason for this, but in short it is above mentioned *value-adding aspect*: The sub-processes do add value to the input(s) while the possibility for evaluating *this added value* arises at any kind of interface for which *intra*-faces (I4 to I6) and *inter*-faces (I1 to I3) can be taken into consideration.
Note that a *two-step* approach to measurement is possible: *coarse* measurement at the interfaces, *fine* measurement at the intrafaces.

Knowing the subject allows to take a look at its transient nature. From this, possibilities for preventive activities are arising. Taken this illustration as basis, Harrington gives "three major objectives" for Business Process Improvement (=: BPI). Due information is of common kind, it provides an over-all and practical approach. Additionally he has identified common characteristics of any *well-defined* and *well-managed* processes. This information is compiled in the two following tables. They provide easy access to process altering via BPI.

| A few common characteristics processes share: |
|---|
| ‣ They have someone who is held accountable for its performing (= process owner) |
| ‣ They have well-defined boundaries (= the process scope) |
| ‣ They have well-defined internal interfaces and responsibilities |
| ‣ They have documented procedures, work tasks, and training requirements |
| ‣ They have *real time* measurement and feedback controls |
| ‣ They have customer-related measurement and targets |
| ‣ They have known cycle time |
| ‣ They have formalized change procedures |
| ‣ They know how good they can be[6] |

Table 5: Common characteristics of processes

[6] "IF HP knew what HP knows, HP would triple profit" (Lew Platt, Hewlett Packard)

| Three major objectives for Business Process Improvement: |
|---|
| ‣ Making processes effective<br>(producing the desired output) |
| ‣ Making processes efficient<br>(minimizing the resources used) |
| ‣ Making processes adaptable<br>(being able to adapt to changing customer and business needs) |

Table 6: Three major objectives for Business Process Improvement

Now that we have identified first answers to the questions of *where* and *what* business processes might be altered, it is indicated to take a look at the process of change itself. At first, the question whether changes should be *declared* (and pushed-through) or *evolve gradually* is answered by Harrington in an unambiguous matter by referring to the latter. This idea is not new and even postulated by ISO frequently, manifested in ISO 9000 (section 2.9: *Continual improvement*). While ISO only presents an overview about the actions (or sub-Processes) necessary to undertake, Harrington illustrates and therewith *visualizes* the process of *change* aligned with *time*. The present condition ($P_1$) is the initiation point-in-time for change. Here the average performance of the process examined is lower than desired. The counterpart is the preferred position ($P_2$) as result of the change process located in between of $P_1$ and $P_2$.

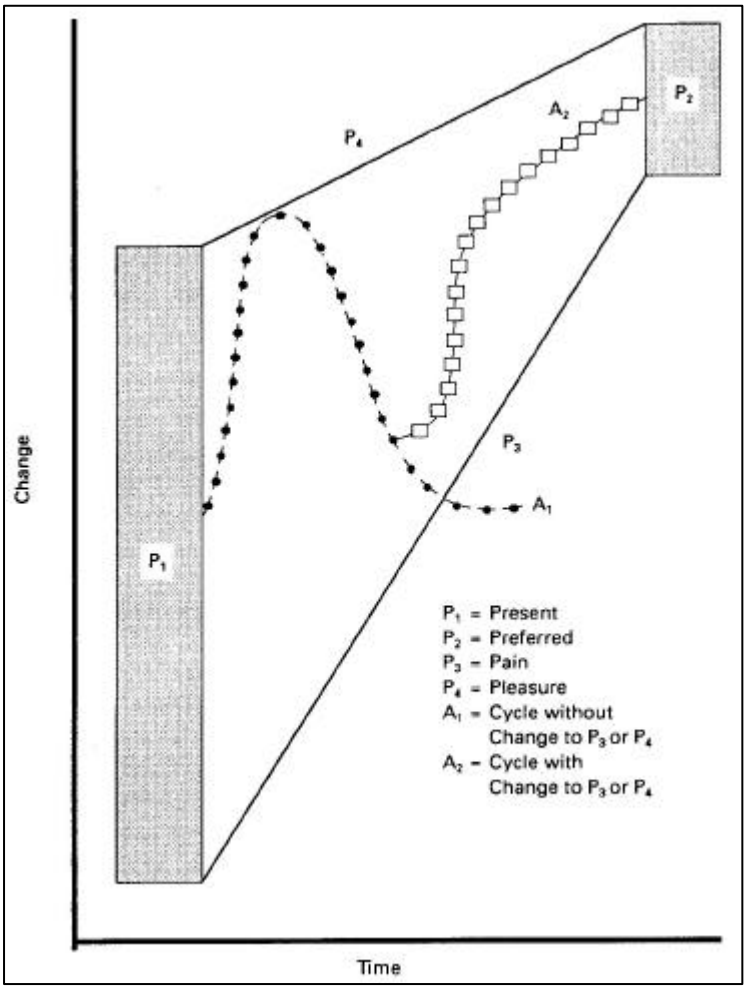



Image 7: Harrington's change process chart

Now that we identified the preferable way of process altering it is about time to seek out for general recommendations to guide this process improvement. To provide the achievement of such improvement, Harrington avoids to describe *actions* to undertake (they are too depending on too much too individual and unforeseeable) but basic *rules*. Please note that describing language is of extraordinary "*soft*" nature as opposed to "*hard*" language like a mathematical formula, for instance.

| 10 rules to guide the process of change: |
|---|
| 1. The organization must believe that change is important and valuable to its future. |
| 2. There has to be a vision that paints a picture of the desired future state that everyone sees and understands. |
| 3. Existing and potential barriers must be identified and removed. |
| 4. The total organization must be behind the strategy to achieve the vision. |
| 5. The leaders of the organization need to model the process and set an example. |
| 6. Training should be provided for the required new skills. |
| 7. Measurement systems should be established so that results can be quantified. |
| 8. Continuous feedback should be provided to everyone. |
| 9. Coaching must be provided to correct undesired behavior. |
| 10. Recognition and rewards systems must be established to effectively reinforce desired behavior. |

Table 7: 10 rules for change process

The presented process characteristica and rules should be attributed to each existing process before merging them. In case the existing processes are seen to lack these postulations, it is recommendable to alter existing processes prior to the merger. If already existing, the process of merging processes should follow these postulations itself, too. If so, a precious benefit can directly arise from the "output" of the process of merging processes. This benefit is the OSP as introduced in the preceding section already and deepend in section 4.5.3. later on.

But before going too deeply into the interests of processes now, it is time to turn the page and deal with the next big element of integration — clarified responsibilities.

### 3.1.3. Responsibilities

Basically there are two scopes of responsibilities: Merging is an activity that depends on serious participation of **management** and **employees** and cannot be achieved without this serious participation of both parties. In addition, merging operators must have over-all support and directive from the management (especially the top-management) to make the merger a success. This is necessary basis for the operators to communicate the desired changes to employees and involve them in an active way. No merging operator can ever have all the knowledge to be considered within a merger. So employees *must* deliver the information and *can* be invited to perform the merger, especially on detail-level. The advantage is close at hand: efficiency of the merged processes is assured the easiest, if information is processed where occurring by those who deal with it on a daily basis. They are the experts in respect to knowledge of / and about the processes in question.

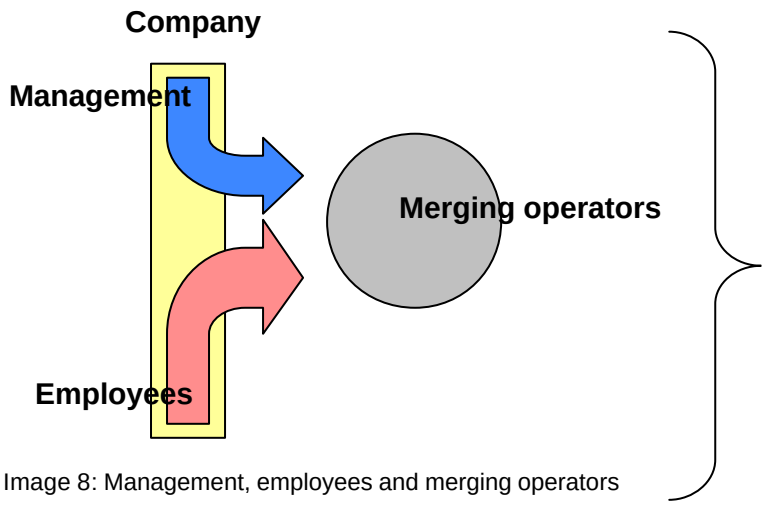



Image 8: Management, employees and merging operators

| Common changes after the merger: |
|---|
| (a) more self-responsibility |
| (b) more transparency |

Table 8: Changes after the merger

The following three sub-sections will deal with the responsibilities attributed to these three groups of people.

#### 3.1.3.1. Managers

Lately published and therewith *up-to-date* studies like "The Impact on Domestic Management Practice" [r27] or "Do Managerial Objectives Drive Bad Acquisitions?" [r33] try to find out whether there is any impact on the merger process, particularly attributed to the management practice. Of course it is plain to see that the impact of management is of crucial significance. While top-management *decides* the merger, it is time to define their information policy whether employees should be informed *at all*, *later* or *never*. And management is responsible to realize that the first contribution to a *successful* merger is to inform employees at an preferably *early stage* of the acquisition and *in a positive way*: "Primary appraisal plays an important role in affecting employees' emotions and subsequent coping strategies during the acquisition. Negative appraisals of the acquisition should be discouraged in order to reduce negative emotions." [r7] This quote includes all the basic aspects management should pay attention to. In detail this is the *necessity of truthful communication* on the one hand and the awareness that employees' *feelings and emotions* are the most opaque aspects during integration processes on the other hand. This makes it obviously "necessary to spend lots of

time and effort on communication" [r11] instead of having the desire to avoid the inconvenience and the complexity that might occur during the integration process.

A merger might bring challenges to be met on the one hand, but these can be seen as chances instead of problems on the other hand. The most important aspect of the latter point-of-view is that company's processes can be altered and improved. A company-wide "clean-up" and "stock-taking" could, for instance, provide the basis for future transparent working processes, proposing to be extracted from the OSP. In addition, this could become the basis for introducing KM — a mid-term investment into the future. In consequence, this will lead to (structural) changes in management practice as well:

> "The study indicates that the process [...] was often followed by significant *changes in management practice*." [r27]

The scopes of "responsibility" and "hierarchy" must be taken into consideration within a merger scenario. If taken seriously, the merger operators need to analyze these scopes for both entities *prior* to merging them and explore the employees' desires, wishes and ideas they have for future. If teams are desired to work "self-efficent" in future, this could affect and modify hierarchic structures as well as organizational structures. Maybe the role of management needs to shift from *directing* to *informing* (or *assisting*) activities in future.

Anyway: management must understand its important role of initiating processes of change. It is of minor importance whether this necessity for change arises from a forthcoming merger, process improvement or anything else. They determine the *nature* of this actions concerning resources and processes and can only decide whether to do so *on purpose* (and choose the way of complete transarency for this) or *under cover* (and put time-bombs of uncertainty all over the company). In any way, every process contains of sub-processes and needs resources to transform the input(s) into output(s). The clearer the management understands its determining role, the more likely becomes integration success!

These theoretical findings are supported by practical extractions: Some studies detect certain "common changes" [r27] within the acquiring process. In short and in detail these are

(a) a shift towards performance-related rewards
(b) a shift towards stronger quality emphasis in operations.

Although this does not sound downright spectacular at first glance, it points out two major trends "among a sample of 201" acquisitions, which lead to the extractions in preceding table 8. Moreover, it is worth noticing that these *over-all* findings are basically the same as extracted from the chapter of human integration. Management needs to understand once and for all that they are the ones *initiating* activities, while employees must understand that they are the once *executing* them. For this reason management must decide and determine *what* the desired goal is. And whether to do the merger under aspects of quality or not.

The answer to this question will have impact on the mid- to long-term shareholder value in addition. The management must face this fact and recognize that shareholders can benefit from achieved quality (or increased quality) in a second step. For this reason managers need to understand the negative effect on the merger in case decisions are driven by personal objectives instead of the maximization of shareholder value [r33]. Transparent team decisions, even *on top-management hierarchy-level*, can help to prevent the often found practice that "managerial objectives may drive acquisitions that *reduce* bidding firms' value" [r33].

As a further result, the presented findings should motivate to improve operations "under a more talented or a better motivated management *team*" [r33] in future.

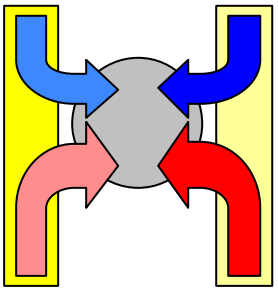
### 3.1.3.2. Employees

The responsibilities of employees depend on the integration way chosen by management. In case the way of quality and transparency is chosen, employees must perceive that *implicit* knowledge needs to clear the way for achieving *explicit* knowledge. In case this new practice turns out to be "inconvenient" in some way, proposals for simplification need to be developed under employees' approach. This is nothing but the basic principle of kaizen.

In short, *if* management encourages employees to participate in the merger process, employees are responsible for (and *should* for their own benefit) providing their ideas, visions and creativity to that process.

### 3.1.3.3. Merging operators

As visualized in preceding image 8, the status of merging operators is described the best as "*in between*", illustrated by the grey circle. They are between the merging entities (i.e. companies, business units (=: BUs) and so on) and between management and employees. And between all resposibilities, as a peculiar result. Of course they have "formal authority" [r23] about people and entities to be co-ordinated, but they need to make use of their "considerable interpersonal and team-building skills to achieve the goals" [r23] they hopefully have. Other M&A observers like Lajoux [r2] support these particular responsibilities belonging to the group of merger actors. This is important due to the fact that merging operators usually are experienced or at a minimum informed about the peculiarities of integrations. Employees usually are not. In result, the operators have example- and expertise function to all involved people. So merging operators should become the first to introduce teamwork, ask for assistance, provide attention where necessary and to request periodic reviews.



This is, of course, a good place to refer to one of the most frequent advices: It is highly desirable that the merging operators are experienced. This is identified as a helpful, precondition for a successful merger, whatever definition of 'success' may look like.

### 3.1.4. Culture & strategy

*"Corporate strategy, the overall plan for a diversified company,*
*is both the darling and the stepchild of contemporary management practice"* [r19]

You might easily agree on the *darling*-side of view, but do you on the counterpart side, too? Lots of managers and directors already heard a vague song in their ears, teaching the necessity of *having any*. But do they know the reason for this? And even more important: do they know what a strategy is? The supposed answer can only sound negative, "because almost no consensus exists about *what* corporate strategy is, much less about *how* a company should formulate it." [r19] My conclusion is that there is no common knowledge about strategy, because it is not commonly interpreted and implemented yet. This needs and *will* be altered over time for the sake of continuous improvement. Actually, here are first measurable changes: "some companies have initiated *large-scale re-structuring programs*", while "others have done *nothing at all*." [r19] The actual tenet is that "those who have re-structured must decide what to do next to avoid repeating the past; those who have done nothing must awake to their vulnerability." [r19]

But although it is hard to achieve a certain goal and not knowing how to reach for it, there are first approaches. These approaches try to find out about the matter of strategy, first: "To survive, companies must understand what a good corporate strategy *is*." [r19] This has become the starting point for my observation. The following quotes will introduce you to that kind of investigated definition, I personally agreed with. This will be necessary to assure you can follow my arguments further on, and especially to understand the reason for me to link "culture" and "strategy" as found in the headline of this section.

> "Several researchers have built on the theory of acculturation to examine the exchanges in behavior that result from the *forced interaction* of two different organizational **cultures**. The argument here is that cultural compatibility will reduce acculturative stress at the individual level, and thus smooth the integration process." [r11]

> "Competetive **strategy** concerns how to create competetive advantage in each of the businesses in which a company competes. Corporate strategy concerns two different questions: *what* business the corporation should be in and *how* the corporate office should manage the array of BUs." [r19]
> And in addition: "Corporate strategy is what makes the corporate whole add up to *more than the sum* of its BU parts." [r19]

In my eyes, this is evidence for my hypothesis that a strategy can only arise, be formulated and at least lead to increased shareholder value if it is part of a company-wide culture [d6]. And, not enough, there is the need to have *two levels* of strategy: "BU (or competetive) strategy and corporate (or company-wide) strategy." [r19] Unfortunately there is no material dealing with strategy on BU level, forcing me to exclude this subject from my elaboration. But there is some dealing with the subject of corporate-wide ("over-all") strategy.

Of course, within a merging scenario there are lots of people on both sides "of the zipper". It is imaginable that "bringing together" these individuals would be alleviated if there was an (assumed) kind of *cultural convergence* of previously independent firms. Of course: the more

the informational, cultural and educational background differs from the counterparts, the less cultural convergence exists. This will, of course, have further impact on the merger. I would like to declare that the process of merging will not become easier if the cultural convergence is low. In other terms: the lower the cultural convergence, the harder the merger.

But what is cultural convergence, then? I'd like to give an example that will explain the *exact point-in-time*, where desired convergence had been *measured*. The statement is from a real merger between two units in Bristol (UK) and Rollsbo (S):

> "Bristol employees rated *themselves* as less employee-orientated than Rollsbo in 1992, and less normatively orientated. By 1996 the opposite was true: Bristol was even more employee orientated than Rollsbo and even more normatively orientated. In our interpretation, this suggests an acculturation process in which the acquired employees were quick to take on the work practices of their acquirers, such that they actually 'overreacted' and ended up more employee- and normatively orientated than the acquiring organization." [r11]

Together with the following statement

> "Finally, Roberts (1994) has proposed that the existence of a 'strong culture' in the acquiring company can potentially have a performance impact if it is transferred effectively to the acquired company." [r11]

the example points out clearly, that it is recommendable to have *an idea* about "a way" for each employee and the whole company to meet futural challenges. Moreover, it points out that culture *can be altered* and is *transferable*. If you know this, it is time to develop a suitable one for your own business: As already hinted in the beginning of this sub-section, "many companies lack a clear concept of corporate strategy to guide their diversification [...]. Others fail because they implement a strategy poorly." [r19]

If there is a transparent basis for culture, strategy can arise from it. As Porter [r19] points out, there are 4 basic concepts for corporate strategy that have been put into practice:

| Concepts of corporate strategy: |
|---|
| ‣ Portfolio management |
| ‣ Re-structuring |
| ‣ Transfering skills<br>(see section 3.2.8., "Value Chains locate synergy") |
| ‣ Sharing activities |

Table 9: The 4 concepts of corporate strategy that have been put into practice

Each of these corporate strategies rests on a "different mechanism by which the corporation creates shareholder value and each requires the diversified company to manage and organize itself in a *different way*." [r19] So the only problem, now, is to choose *your way*. But because there are four different concepts, each identified from *practice*, there is no general recommendation[7] for an abstract (or "best") choice. The most important questions you need to ask are "*where are we now?*" and "*do we want to be there by tomorrow?*". Anyhow:

[7] in this particular situation at Lucent Technologies, only the latter two remain.

> "Companies can succeed with any of the concepts if they clearly define the corporation's role and objectives, have the skills necessary for meeting the concept's prerequisites, organize themselves to manage diversity in a way that fits the strategy, and find themselves in a appropriate capital market environment. The caveat is that portfolio management is only sensible in limited circumstances." [r19]

And so there are lots of hints one needs to deal with, pointing out several subjects of concern, before *walking your way*: For instance, in service firms[8] and sectors like "financial services, computing, office equipment, entertainment, and health care, interrelationships among previously distinct businesses are perhaps the *central concern* of strategy." [r19] It is noteworthy, too, that "an individual firm's strategy *can change* over time as well." [r29] This is necessary due to the fact that a strategy should work over a long period of time, even if the market of competition should change completely. To avoid the problem of frequent alterings, then, the strategy must be based upon *common* and *elemental* facts and provide *flexibility* in addition. Several authors align with the following idea, though verbalization slightly varies: "Yet corporate strategy should not be a once-and-for-all choice but a vision that can evolve. A company should choose its *long-term preferred* concept and then proceed pragmatically towards it from its initial starting point." [r19]

Then, a strategy can truly enrich the resources of a company and help to create shareholder value. The author knows the reason why: "A company will create shareholder value through diversification to a greater and greater extent as its strategy moves from portfolio management towards sharing activities. Because they do not rely on *superior insight* or *other questionable assumptions* about the company's capabilities, 'sharing activities' and 'transferring skills' offer the best avenues for value creation." [r19]

But "to understand the role of relatedness in corporate strategy, we must give new meaning to the often ill-defined idea" of strategy. The author describes the value chain(s) he detected within his studies and how they fit to strategy. I decided to demonstrate his ideas concerning transferring skills (orient yourself by preceding table 9) only and rejected to present the other. So this is the way a company can approach the implementation of a corporate strategy:

| A company can... [r19] |
|---|
| ‣ "employ a re-structuring strategy at the same time it transfers skills or shared activities." |
| ‣ implement "a strategy based on shared activities" which "becomes more powerful if BUs can also exchange skills." |
| ‣ "pursue the two strategies together and even incorporate some of the principles of restructuring them." |
| ‣ "also investigate the possibility of transforming the industry structure." |
| ‣ become aware that when a strategy bases "on interrelationship, it has a broader basis on which to create shareholder value" |

Table 10: What a company *can* do when building up a strategy

The concluding kind of advice is that the "study supports the soundness of basing a corporate strategy on the transfer of skills or shared activities." [r19] If this strategy is based on a company's culture so that people *know* about it, *accept* it and are the ones continuously *improving* it, the duo "culture & strategy" will evolve to a triangle, including "future", too.

[8] the term "service" is seen as counterpart to traditional "producing" firms here.

Actually, 'culture' and 'strategy' are terms often used and mixed-up with related terms like '*mission*', '*policy*', '*vision*' and '*philosophy*'. Hopefully, this section led to the insight that *formulating* any of these terms on any kind of paper is no longer enough and basically never was. While some companies presented a kind of continuous text and named it *'strategy*', others thought about how this strategy could directly arise from their business:

| Premises of corporate strategy [r19]: |
|---|
| ‣ "Competition occurs at the BU level"<br>"Diversified companies do not compete; only their BUs do. Unless a corporate strategy places primary attention on nurturing the success of each unit, the strategy will fail." |
| ‣ "Diversification inevitably adds costs and constraints to BUs."<br>There are obvious costs (ie. price of purchase) and hidden costs (ie. explain BUs decisions to management, spend time on planning, live with parent company guidelines, personnel policies, costs of employee motivation, ...) |
| ‣ "Shareholders can readily diversify themselves."<br>"Shareholders can diversify their own portfolios of stock by selecting those that best match their preferences and risk profiles." |

Table 11: Three premises of corporate strategy

"These premises mean that corporate strategy cannot succeed unless it *truly adds value*." [r19] Of course, this *value adding* must be initiated, communicated, monitored, continuously evaluated and, if necessary, altered. For this reason, companies need a culture that supports creative postiche rather than wasteful innovation [r64].

### 3.1.5. Outlook: Finance & economics

When economists have to deal with merging scenarios, they soon must admit that future stock market evaluation is highly unforeseeable. The resulting vagueness as reported in some actual studies states wealth gain that ranges from *slight growth* to *broad shrink*, with an "average abnormal return of -5,5% during the first twelve month" [r34]. In other words, the success of a merger must be expected to fail. The reason for this sceptic statement is to be found within the particular evaluation of "success" by economists: While the stock market value is evaluated immediately before and after the merger announcement, the resulting delta is either about zero or significantly negative as stated before. This is the reason for mergers and their announcements to be seen with serious concerns [r19], although these negative returns must not be evaluated as "evidence for a bad investment" [r33] — it could be interpreted as long-term capital expenditure, for instance.

But a short-term market reaction must be seen as a "highly imperfect measure of the long-term success" of a merger [r19]. The average duration of mergers takes several years[9]. For this reason, merger resulting benefits (such as synergy) can be measured *after* this period of company assimilation. The *soonest* [r25] point-in-time when merger benefits *may* show any positive effect on stock market value is seen 12 month post merger announcement. This classifies the existing practice of comparing accounting data to be an imperfect measure for

[9] Please see section 3.2.1. ("Starting Integration @ what Point in Time?") for more precise information.

evaluating the success of a merger[r26]. This is supported by the fact that individual managerial decisions shape the process of M&A, so the figures cannot be evaluated beyond their context.

Moreover, economists disagree about the reasons for stock price performance altering. In case positive gains are detected, the question arises whether these gains accrue due to "optimistic *expectations*" [r34] or "*real* economic gains"[r26]. If the latter are detected, its source must be identifiable. But the identified source for gains bases on the realization that a great earning predictability is a "major attraction particulary to potential investors who depend on past data for investment analysis and selection" [r31]. This indicates that "expections of economic improvements underlie the equity re-valuation of the merging firms"[r26]. When taking into consideration that mergers and acquisitions often are "fueled by junk bond financing" [r19], any kind of economic prognosis must be questioned in general these days.

Studies investigating the economic effect of mergers often fail to compare these individual mergers. "*Metholodical* problems" like "benchmark errors"[r34] lead to interpretational difficulties, especially in the early studies that tried to enlighten this nebulous practice of stock market evaluation [r26].

To prevent this kind of uncertain and weak evidence, it is suggested to support traditional "strategic and synergistic considerations relating mainly to finance" by scientific investigation of "risk minimisation prospects of the proposed merger and co-movement of portfolios"[r31], whereas it is of major importance to attribute financial synergies and the risk economics to *present* and *future* corporation health of the merging enterprises.

Nevertheless it is crucial not to lose courage when a corporate merger is seen as appropriate target to solve future challenges and competition. Especially in the long-run "it is pointed out that both values (of the bidding and the target firm) do increase as a result of takeovers." [r26]

### 3.1.9. Special focus: R&D

*"Differences between the two systems,*
*combined with the geographical and cultural distance [...]*
*created much greater obstacles to joint development than anticipated."* [r11]

Unfortunately, a lot of mergers among R&D units show a lack of major importance: The lack of synergy! Many companies who tried to merge their R&D units resigned: "No evidence found for improvement is achieved at the expense of the merged firms' long term viability, since firms maintain their capital expenditure and R&D-rates in relation to their industries." [r26] Synergy certainly cannot be achieved if the adding-up of expenditures to each of the two entities in question do not differ from the expenditure to the merged entity. But how can these synergies be achieved in R&D business?

Although everyone needs to be involved to generate synergy in teamwork[r58] there is no doubt that "distributed development is difficult", as quoted by a development manager in one of the integration questionnaires. But nevertheless, it is possible. In some cases, especially if the developing units are spread over several countries, it is worth to think about whether the

desired merger should be of real or more "virtual" kind: There are examples stated where the units were merged only by creating a "virtual R&D organization" [r11] spanning the countries. In doing so, it may be of major importance to take "the path of least resistance, ie. paralel development" [r11] which will —of course!— not lead to synergy. At least as a first step. But "accepting overlapping activities in the first stage (2 years)" and "later eliminating them" [r11] can lead to real synergy and transparent processes over time. A condition is, of course, that affected employees are involved when the management decides this uncertain step into the future. And this means, for instance, to prevent situations like these, too: "One individual commented that he did not even know whether his counterparts [...] had actually used the software he wrote: 'All I know for sure is that I gave them a copy of my source code'." [r11]

But trying to prevent is not enough; integration must be *done*. If integrating activities are supported by management and the merging operators, there is hope to prevent this by activity. It is not bad to know that it is *only hope*: "It is interesting to note that the (very experienced) integration task force admitted that they were unable to either forsee or forestall the emergence of parallel development practices" [r11]. The true meaning of this quote is, that integration processes of any kind are highly individual (due to a multitude of reasons) and not worth planning: There are always too many vaguenesses in an opaque future. And the future is still unforeseeable at all. At least, there are some guiding and helpful extractions to be considered when integrating R&D units:

| R&D recommendations |
|---|
| ‣ "Internal efficiency:<br>Linking the R&D work to business strategy and pushing for results-directed development" [r11] |
| ‣ Developing a "strategic culture" is a major problem, "especially in merging R&D" [r2] |
| ‣ Provide one person for "overview but not responsibility" [r2] |
| ‣ Assign a "launch manager" who's job is to "follow development projects through to their market launch." [r11] |
| ‣ "Increase the number of technical information seminars, training classes, and international project teams." [r11] |
| ‣ Interview the development staff [r11] !<br>- "interviews with r&d-staff were semi-structured" (free talking = enabled)<br>- "interviews were absoulety confidential"<br>- "2 interviewers used every time"<br>- "key individuals" (2 on each 'side') asked to fill in seperate worksheet<br>- "questionnaire asked for individuals' views, only |
| ‣ Build up an IPCS [r11] (as recommended by Gardner Group[10], for instance) |
| ‣ Enable management to learn:<br>"The interviews [...] suggested that there had been some *learning from* the Holger project: Development for the next generation of process control systems was being undertaken in a series of smaller projects, each with a clear mandate to develop a common solution." [r11] |

Table 12: R&D recommendations

Please note that the criteria for Gardner Group's evaluation of a "successful merger" [r11] were the "successfully combined '*completeness of vision*' and the '*ability to execute*' " and how this fits to preceding chapters and sections. The explanation for Gardner's evaluation contents

[10] Gardner Group is an independent industry rating service.

the following quotes, too: "acquisition required a high level of R&D interaction to be successful, and in this regard it *was* successful, even if *delayed*." This goal was achieved due to "integration led to a series of interconnected technology transfers and combined development projects."

So at last the result of the R&D merger was synergy and a higher emphasis on quality. And in my eyes, this is a goal worth to achieve, even if the way[11] is ambiguous.

[11] or trajectory, process, ...

## 3.2. Integration constraints

*"Tell me, and I will forget.*
*Show me, and I will remember.*
*Involve me, and I will understand."* *Lao-Tse.*

A further integration aspect is not dealing with the elements needing to be integrated, but the process of integrating them — the integration *'how-to*". Especially the scope of and for integration is presented as well as integration preconditions. So the following sections present particular integration constraints that need to be considered within a merging scenario. Common constraints concern time, risks, synergy, processes, strategy, QA and human beings.

### 3.2.1. Starting integration @ what point in time?

*"Its just a question of time!"* *Depeche Mode (1986)*

In general, the question of timing is assessed to be of "major importance" by almost all authors I studied. Empson, for instance, thinks [r4] that "the issue of timing is particularly important for managers of professional service firms, where value can be rapidly destroyed through the loss of staff and clients." Moreover she holds the opinion that an integration process "too soon and too fast [...] may impose ill-considered changes on a demoralized workforce. Too late and too slow and they run the risk of failing to exploit market opportunities."

The pieces of advice dealing with this particular question, however, are just *similar* to some extent (but not the same): Lajoux [r2], for instance, explains that "mergers take time" but recommends to be "rapid" due to a higher chance for the integration process to become successful. For instance, a rapid proceeding reduces integration costs. But what is "rapid", then? Several studies like those examined by Birkinshaw [r11] found examples for successfully evaluated integration processes — they took up to 7 years! But all studies I worked trough agreed on the counsel *when* to start with the integration communication process: "rapid communication of information about the acquisition as soon as it was announced" [r11] is seen as an essential precondition for a merger to be evaluated as successful in retrospection.

Empson [r4], again, states that "a leisurely approach to organizational change may seem anachronistic in the new era of 'Business @ the Speed of Thought' [d4]" on the one hand, but enables a kind of "organic growth". Growth of this kind (or nature) is to be preferred in comparison to *dictated* growth that arises from a fast-track approach. Section 3.2.6. ("Management impact on human integration") legitimizes this statement from a different point-of-view.

Concerning the question of time (i.e. *start* and *duration*), there are —of course— situations imaginable were a *leisurely approach* to integration is impossible or simply not recommendable. But to solace integration managers and ~operators finding themselves in

such a situation, there is the statement that "a fast track approach to integration can work under certain circumstances...". These circumstances are identified and presented in section 3.2.6. ("Management impact on human integration").

The over-all recommendation concerning the question of time and duration can finally be summed up in one single sentence: Start as soon as possible (in any case) and consider that the merger might take longer than originally expected.

### 3.2.2. Dangers & risk analysis

*"Do the right things right, the first time, every time."* *Macdonald (1995)*

"The primordial and sustained consideration / justification for this [= merger] strategic option had been financial synergies and allied economies. In so far as these are very necessary, they are far from being sufficient."[r31] Although there are lots of well-known risks needing to be considered, there are further risks especially on the side of finance and economics. Some of them may not seen that obvious and crucial as the question of the merged firm's financial future, but they are *not* of minor importance. The contrary is right as presented in the following.

One common problem is attributed to *integration planning*. It has been quoted frequently that "project deadlines had been 'completely unrealistic'."[r11] Apparently, statements like these were found especially in companies where "managers focus on the job they have been given rather than on the whole."[r11] This makes it inevitable for the management to change their management practice. Maybe they need more time in future — not for *planning*, but for *communicating* and *involving*. If employees are the ones *doing the merger job* within (several) BUs, managers are the ones needing to *co-ordinate* them and are responsible for a transparent overview. All the perspectives, visions and processes can be 'collected' and evaluated then "to make the outcome of merger analyses more *integrative* and *interactive*."[r31] A theory by Hespeslagh and Jemison[r5] "envisions top management to create a structural and strategic context that *shapes* the behaviors of organizational participants at various levels" by the managerial "decision process"[r11]. Most notably, "several researchers have focused on the cognitive limitations of managers [...] to explain such phenomena as activity segmentation, escalating momentum and expected ambiguity in the integration process."[r11] But some of the studies I found hold different opinions, as pointed out by following extraction:

> "While Drucker (1973), Thierauf et al (1977), and Griffin in (1990) contended that defective management of men, money, materials and machines (4 Ms) is responsible for general corporate disorganization and sub-optimization, Mintzberg (1973), Kotler (1980), Higgins and Vinze (1993), Fubara (1996), Ottih (1996), attributed the dwindling fortunes of many commercial and industrial organizations, in developing economies in general [...], to ineffective development and management of corporate strategy, overt and covert power influence / information systems, and allied socio-industrial logistics."[r31]

In case this statement is accepted as a working hypothesis, management needs to be enabled to distinguish *risk* from *uncertainty*, if present situation is expected to improve:

> "**Risk** is referred to as a situation where the *probability distribution* of cash flow of an investment proposal is known. On the other hand, if *no information* is available to formulate a probability distribution of the cash flows, the situation is known as **uncertainty**." [r31]

The following hypothesis [r31] will be helpful for risk-*minimization* prior to and during the executing of the merger process:

| Principles of risk minimization: |
|---|
| 1. There is a significant difference between the pre-merger risks of the firms and the post-merger risks |
| 2. The post-merger corporation health of the firms is better than the pre-merger corporate health |

Table 13: Principles of risk minimization

Due to the fact that "risks are *multi-dimensional*, and *multi-directional* and traverse the *entire frontiers* of the world of business in so many ways" [r31], this goal is everything but easy to achieve! Especially, if risk analysis and ~prevention is understood as a *separate activity*. It is much easier to understand and fight occurring risks and further upcoming problems in case the company's culture and its strategy are integrated within this process of risk prevention:

> "Experts, who reckon TQM-school are conscientiously advocating and inculcating in organizational members, the predisposition *to do the right things right, the first time, every time*" [r31]

This includes risk analysis as a *necessity* on an over-all basis, first. Of course, managers surely cannot foresee every kind of multi-dimensional and multi-directional risks. Perhaps it is helpful to accept the fact that nobody can foresee *all* the imponderables that might arise during integration. But if anybody can foresee as many of those imponderables as possible, it is a *pool* of people: the company's people as a whole. This ensures a look *across the board* and includes foreign point-of-views and considerations.

And so the quintessence of this sub-section aligns up to the preceding ones: encourage and enable human resources to contribute their ideas to *any* kind of process found within the 'old' company. The outcome will be a stabilized 'new' company with the best chances to challenge the future: In mergers, "concentration on financial / managerial synergies as justifications has become obviously *peripheral*. The possibility of adding or scheduling significant weights of risk poses a more *strategic* and pragmatic dimension of merger feasibility." [r31]

### 3.2.3. Synergy and other benefits

*"It is believed that synergies exist"* [r25]

Managers often desire to achieve certain benefits from a merger. Although there are several possibilities for concrete benefits, most of them arise from achieving synergies. But they are hard to achieve. Studies are even uncertain whether synergies exist *at all*. No study I found distinctly pointed out what kind of synergies may exist nor how they may be achieved. "*Synergy* is declared to be the expected (but unmeasured!) source" [r26], which makes it hard or even impossible to extract distinct findings concerning the subject for benefits as attributed to merger scenarios.

Lots of studies point out the absence of benefits, synergy and 'X-efficiency': "No evidence found for improvement is achieved at the expense of the merged firms' long term viability, since firms maintain their capital expenditure and R&D-rates in relation to their industries." [r26] Although highly related to a special sub-focus of a merger —i.e. the R&D branch of business— this quote aligns up to several studies. Often it is mentioned that "our results point to a leveling off in efficiency differences after mergers took place. Most disappointingly, even for mergers which took place five or eight years ago, no X-efficiency gains could be observed." [r32]

For trying to achieve synergies, the last quote does not sound very optimistic. But according to the introducing quote there may be hope to identify synergies elsewhere. And "the comparison of US and Japanese change process suggests that there is *more than one way* to *develop value* from acquisition." [r27] So my intention is to demonstrate one particular way to achieve synergies. This proves the *existence* of synergies and points out their *location*. And although the management understood the necessity to achieve operational synergies in most of the cases I read, it must be clearly stated that "in none of the cases were these synergies delivered *quickly*." [r11]

Giving more substance to this time-related point-of-view, several studies and especially *long-term* observations found out that "the need to capture the benefits of relationships between BUs has never been more important." [r19] Unfortunately, this is endangered or completely prevented by an "often ill defined[12] concept of synergy" [r19]. But if the management does fail to define a proper concept for synergy, there is still hope that even *erring* decisions may lead to a useful outcome: "there are strong reasons to believe that a trajectory of integration that errs on side of caution can be very effective" [r11] — if integration is *done* at least. This includes that *one* goal of integration, the achieving of synergies, may change in the course of its trajectory. Integration is no linear[13] process! For this reason, synergies might occur where nobody expected the unexpected. And vice versa: Do not feel sorry if synergies do not arise where they were assumed. Ensure that at least there is a broad and generalized *basis* for them to occur. Maybe, they come out later: "The renewed integration was not the continuation of the earlier process, but the result of a corporate-wide re-organization that was motivated by rather different objectives" [r11].

[12] to get rid of this 'ill defined' concept of synergy, flip to section 3.2.8. ("The Value Chain for transferring skills")
[13] as illustrated in image 10 and image 16

Anyway: If management enables humans of both sides to become familiar to "the other side", they can contribute valuable information where processes and standards could be altered *concretely*. In case employees are allowed to question and challenge *everything* [r20], the information for process enhancing can arise *bottom-up* and reach the management, where this information can be used for consideration for OSP design in a second step.

Aligning with preceding findings, it may be without *any* effect when the synergies intended to achieve are defined on paper. The following quote supports this idea and states one possible reason: "Even synergy that is clearly defined often fails to materialize. Instead of co-operating, BUs often compete." [r19] The reason for non-occurring synergies seems to be the traditional lack of communication. The idea of direction and control seems to be more familiar than the idea of self-reliability and self-organization, based upon transparency. Only ifthere is a common information pool available to all kind of employees and managers, this competition can vanish for the sake of achieving a common base of knowledge.

While preceding considerations point out the problematic nature of achieving synergy, I would like to stress this impression by presenting the following ideas dealing with this problematic nature: "synergy is often declared on papers" [r2], "imagined synergy is much more common than real synergy." [r19] and even "the overestimation of synergy is a frequent failure" [r2]. My aligning proposal is to avoid synergy definition (by management) for the sake of creating a scope for synergy to arise by asking the people working in those particular unit(s) where synergy is desired and imaginable. The crucial activity prior *inventing* and *creating* synergies then is, that "the company must in place a variety of what I call horizontal mechanisms — a strong sense of *corporate identity*, a clear *corporate mission statement* that emphasizes the importance of integrating BU strategies, an *incentive system* that rewards more than just BU results, *cross-BU task force*, and other methods of integrating." [r19] This may become reliable basis to exploit synergies in the mid-term.

Nevertheless, the exploitation of synergies still needs to be evaluated as problematic. The reasons are manifold and arise from the following findings as detected by Empson [r4]:

| Problematic synergy: |
| --- |
| ‣ Knowledge is an attribute to individuals |
| ‣ Relationships between individual clients and individual professionals (Alvesson, 1995) |
| ‣ These individuals enjoy considerable autonomy (Greenwood, Hinings and Brown, 1990) |
| ‣ These individuals have distinguished negative emotions at a merger ⇒ negative behavior as passive & active resistance and departure |

Table 14: Problematic synergy

Finally, *knowing* these facts about common pitfalls provides a solid basis for a sober view, trying to sail around these obstacles. The major problem is that synergy can only be achieved in case the *individual* knowledge enters a *common* knowledge base. This base, then, must become a forum for exchange and storage of knowledge. This provides an actual view about the *resource knowledge* available. In a second step, existing and collected knowledge provides the possibility of identifying processes and process parts that are existing twice (so one of them could be erased) or have similar assignments (so it is advisable to unite them). Please note that given examples in parenthesis represent two different kinds of synergy: While the first refers to the *sharing of activities*, the latter refers to the ability of *transferring skills or expertise*. These two types of synergy are dealt with more deeply in succeeding section 3.2.8. ("Value Chains locate synergy").

### 3.2.4. Fighting the "High School-Dance" phenomenon

*"I found that the integration process unfolded gradually in all firms.*
*The metaphor of the High School Dance illustrates the dynamic of the process."* [r4]

This statement by Empson is illustrated more detailed in the following quote:

> "At traditional school dances, boys and girls line up on either side of the gymnasium, under the watchful eye of their teachers. Unwilling to make the first approach, they conceal their anxiety by making disparaging comments to their friends about the girls or boys across the dance floor. Eventually a few of the more confident individuals cross the floor to find a dance partner. Encouraged by this success, more and more students seek out dancing partners. Those who fail to find a partner leave the gymnasium. By the end of the evening 'integration' has been achieved.
> The key point to recognize is that, while the teachers can *organize* the dance, they cannot determine *who dances with whom* or, ultimately, whether the evening is a success. They create the context for 'integration', but the impetus for integration comes from the boys and girls *themselves*."

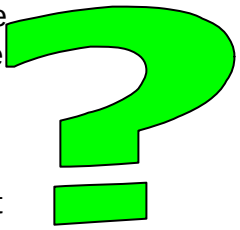
With respect to the following sentence in her report "I observed the same dynamic in professional service firms [...]." it is clear what the High School metaphor stands for: individual fear in approaching something new and previously unknown. But there is a solution for this problem: In detail it is to be found in the quoted study [r4] and cannot be reproduced here. A brief overview how this integration goal can be achieved not in the gymnasium but in merging human resources is presented in the following paragraph. The description is presented in review to stress the fact that Empson observed this phenomenon in her observations.

At first, only the merger initiators of both companies established contact while employees were left unconsidered. Within the following **acclimatization** phase most individuals avoided contact with their merger partner colleagues. Although senior managers adopted an essentially passive role during this process, entrepreneurial individuals advanced the integration process by seeking out like-minded and potentially useful colleagues to explore opportunities for co-coperation. Then followed the period of **transition**, where more and more recalcitrant individuals recognized the benefits for co-operation and the most adamant change-resisters resigned. From the third year onwards, **integration** began to occur, as the perceived boundaries of the firms became blurred and individuals' organizational affiliations started to change.

To summarize this section, the recommendation in respect to human integration is to confront employees on both sides with their counterparts *in public*, where integration entrepreneurs can encourage others to follow their example. This is the basis for individuals to seek out synergies via co-operational opportunities. Those willing to face this challenge now will need some time to proceed steadily, while integration antagonists should be encouraged to either change their opinion or to resign in consequence. With behavior like this softened boundaries will clear the way for integration and the possibility of synergy achieving.

### 3.2.5. Tasks & processes

The way to integration undoubtedly crosses the scope of processes. Please understand that the term 'task' is seen as equivalent to the term 'processes' within this elaboration. Prior talking about processes, it is recommendable to ensure a common understanding of it, as already undertaken in the excursus of sub-section 3.1.2.1. ("Nature of (Business-) Processes"). Now the next sub-section will try to explain peculiarities of integration processes. Compared to casual processes, an integration process is nothing but a process with two minimum differences: The first difference to a casual process is its "**Y**" structure (top-down view) with a minimum of two input- and one output interfaces. The input interfaces are represented by the companies (or processes) to be integrated, while the result will be measurable at the output interface. The second difference is a basic activity (or sub-process) within the integration process — the merging activity. Its essential question is "how can parts be put together?" So one can say that in design *and* function a merger process always looks like a zipper. It has the mission to bring its left side *together* with its right side and to *hold* them together in addition.



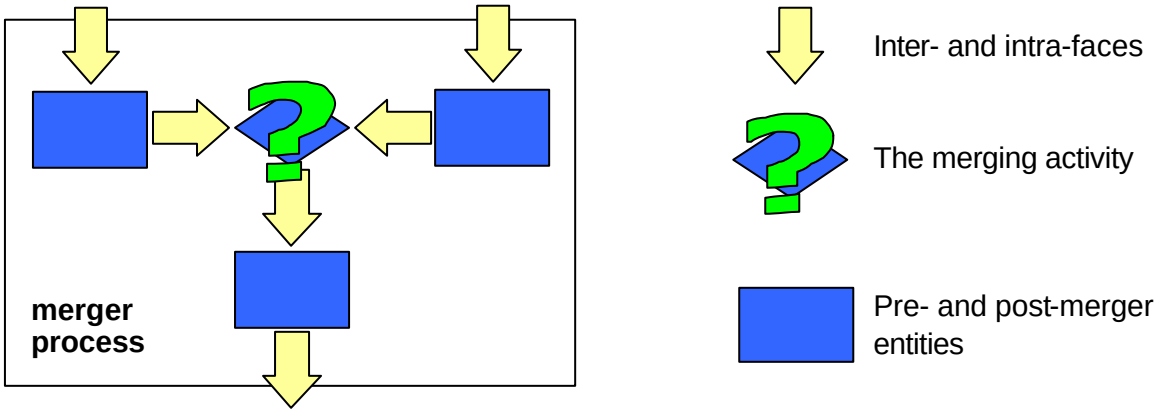



Image 9: Illustrating the merger process

This illustration is recommended to keep in mind when reading succeeding sub-sections.

#### 3.2.5.1. Integrating processes

The purpose of this sub-section is to presents a process merging process. It is extracted from section 4.5. and is the only reference I could find dealing with this particular integration concern. In case there might be any comprehension difficulties, please feel encouraged to try and understand it in the context of that section.

The Software Productivity Consortium (=: SPC) holds the opinion, that "a process improvement effort must be run like any other project" and therefore the responsible Systems (or Software) Engineering Process Group (=: SEPG)-lead must manage this effort. This management activity includes determining the objectives, planning their achievement, to obtaining and allocating resources, and monitoring the complete progress so that the plans can be adjusted for problems that will occur presumably. So the first five basic activities can be enumerated as follows:

| Five steps for SEPG lead replace the question-mark: |
|---|
| 1. Understand context |
| 2. Analyze risks |
| 3. Plan project |
| 4. Execute project (merge processes) |
| 5. Manage and re-plan |

Table 15: Steps of integration

These steps are processes, each built on a number of sub-processes. It is recommended to undertake steps in presented order, so activities 1 to 3 can provide input to process four, the *real* merger process. This activity is followed by managing and re-planning activities to continue process merging as needed. The following image will present the steps to be undertaken from a more detailed point-of-view. A second detail that becomes obvious in this illustration is its evolutional spiral character, underlining the fact that real improvement needs *continual* effort:

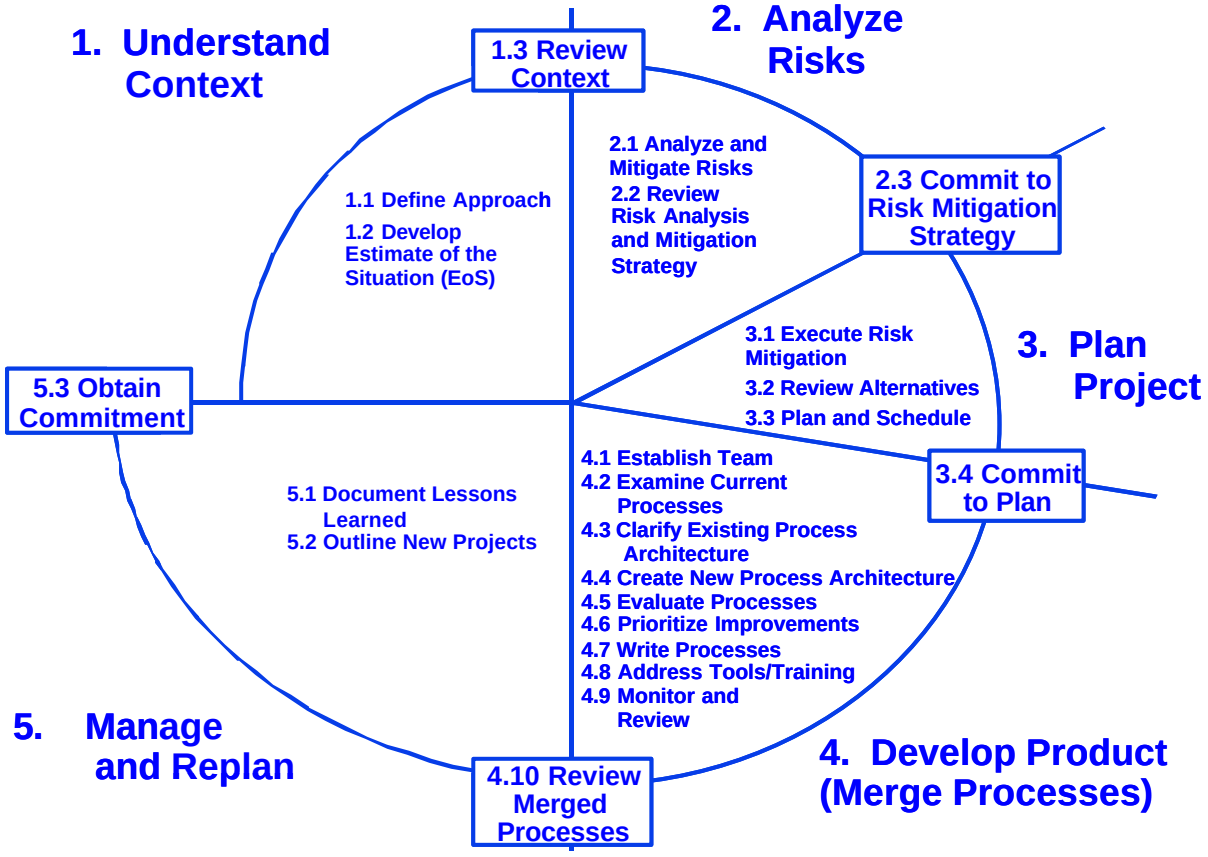



Image 10: The ESP

The presented process elements are identified from a practical approach and can be classified as *elemental* and *valuable* for that reason. At least concerning the process perspective of integration. But please recognize that SPC study closes by quoting Pogo: "Finally we have met the enemy, and he is us". Merging the processes has been identified as *one* aspect of integration only, leaving the human aspects completely unsolved. As a maximum, its significance should never exceed 50% for the sake of human integration for that reason.

### 3.2.5.2. Integration process constraints

The general recommendation found in various studies like Lajoux [r2], for instance, sounds like this: in each integration scenario, integrate both HRs, both other resources and both processes, first. Then integrate the outcoming three leading to the renewed company within a second step. This includes a kind of "two step"-approach, which seems to be an essential integration mechanism due to the findings of multiple studies. Note that the two-step approach stresses the awareness that integration cannot be achieved within one directed and planned step. Its importance is stressed within this elaboration by creating an own section dealing with this phenomenon to a higher extent.

To provide a successful integration, it is necessary to know that the success of process integration is neither *foreseeable* in extent and rate nor in the point of achievement: A particular study, dealing with three case studies for the subject of integration, provides the following finding: "The most striking observation is that task integration was not achieved to the extent that was planned at the time of acquisition, nor at the same rate." [r11] Moreover it is stated that, "task and human integration [...] can probably occur at different speeds." [r11] Nevertheless, all of these three studies were seen as "successful"!

According to some authors, "wise executives will be strongly in favor of merging engineering processes in a timely and robust manner" [r23]. Unfortunately, Sheard avoids to define "timely" as well as "robust". The general recommendation is, however, that it is important to start the top-down communication process as soon as the merger is decided. Besides, the question of duration seems to be of different importance — some studies [r11] even describe the once initiated merger process as actually still "ongoing". This statement gives evidence that a merger usually re-shapes all participating entities.

For integration it is important not to use *any kind* of "pushing through"-mechanism in addition. These mechanisms most likely endanger the anticipated success. The study continues in compliance: "In all cases, however, it is clear that the decision *not* to push integration harder was made with good reasons." [r11] These statements allow the following conclusion: *If* there is an integration process, it cannot be a static process nor a "**linear process**" [r11].

If responsibilities are actualized, a good point-in-time to start the merging process is reached. The two primal sub-processes are **merging HR** and **merging processes** — over time. Possible results that must be taken into consideration when "planning" the merger might highly differ from intended results, as following quotes will document: "Task integration, it turned out, did not lead rapidly to the achievement of the anticipated synergies [...]. Human integration, by contrast, led to a relatively more comprehensive integration [...] in terms of organizational culture convergence and mutual respect" [r11] In addition it is worth notifying that "a relative emphasis on either task or human integration can potentially have a significant negative impact on the outcome of the acquisition" [r11] Nevertheless the same study continues to stress the fact that a "shift towards greater task integration was facilitated in part by the extent to which the human integration process had been completed". This gives evidence to the finding that it may be preferable to focus on HR integration for the reason of efficiency: In this case, benefits occur on human side as well as they do on process side. Please see image 16 ("trajectories") for further explanation.

These statements point out how open-minded, careful and slow the *doing* of an integration has to be made. After taking this circumstances into risk consideration and analysis of the

merger process, you might use the following integration mechanisms (or sub-processes) to enable a preferably successful integration:

| Integration mechanisms |
|---|
| ‣ Common standards |
| ‣ International staff meetings |
| ‣ International task forces |
| ‣ Cultural awareness seminars |
| ‣ Mixed project teams |
| ‣ Video conferencing |
| ‣ Quarterly development meetings |
| ‣ Joint R&D personnel training programs (1) |
| ‣ Joint R&D meetings (1) |
| ‣ R&D personnel rotation (1) |
| ‣ Task specialization during integration (1) (2) |
| (1) as taken from a study with R&D focus [r11] |
| (2) "qualitative measure" [r11] |

Table 16: A pool of integration mechanisms

Preceding table will need one additional explanation. Complementing the last bullet it is interesting to know that employees' approach to their counterparts has been observed by merging operators in a *qualitative* way. In other words, merging operators were able to measure the extent to which both units "moved towards more clearly defined and more specialized areas of responsibility following the acquisition. This construct emerged during the research." [r11]
Please note that the presented mechanisms were identified from literature [r5] [r11] [r14] [r15] as "potentially valuable to both, task and human integration" [r11].

In general, a common integration tool can be summed up in just one single word: **share!** [r2]
The advice is to create shared services, especially in networked companies [r63]. Over-all *accounting*- or *service units* do provide the basis to become that kind of shared service provider, where any unit can buy services from (an)other. This supports the synergy idea as presented in section 3.2.8. ("Value Chains locate synergy") more detailed.

When indroducing the merger decision to gathered staff, special attention must accrue employees job concerns and the fear of loosing power on side of established management [r63]. Opposed to this fear, the legitimate hope to increase business effectiveness must be taken into consideration to explain undertaken decision. Of course, "strategic and organizational fit, it is argued, offer the *potential* for synergies, but their *realization* depends entirely on the ability of management to manage the post-acquisition process in an effective manner" [r11]

After all, the integration process has two major constituent parts. The first of this parts (or sub-processes) as represented by preceding image 10 ("The ESP") is the process of merging processes, while the process of merging HR represents the second basic sub-process. Both of these sub-processes are identified as *common* and *general* counterparts of *any* merging activity.

This recognition lead to creation of section 3.2.9. ("Integration needs two steps!") where both of these processes are presented as parallel processes inside integration. But prior

deepening process concerns, it is important to have a further look on the human impact on integration. That is why the next section deals with this particular aspect from management point-of-view for this reason.

### 3.2.6. Management impact on human integration

*"According to Roll (1986), managers of bidding firms are infected by hubris, and so overpay for targets because they overestimate their own ability to run them."* [r33]

The first impact of management decision on the merger is dealing with its intended **duration**. Management needs to decide [r4] whether a "fast-track approach" is preferable or the merger is intended to *evolve gradually*. In case a fast integration is desired, it is recommended to assure the following three preconditions that do *not apply* in the most cases:

| Preconditions for fast-track mergers [r4]: |
|---|
| 1. Both sets of managers have detailed and accurate information about each other's firms |
| 2. Senior managers agree about how value is to be created from the merger, and their view is backed up by realistic implementation plans (*within* and *between* the firms) |
| 3. Key value-creating resources are identified and 'ring-fenced' to prevent value destruction |

Table 17: Preconditions for fast-track mergers

But the general recommendation given by most of the experts dealing with this particular question is to prefer a kind of "organic growth" [r4]. Tardiness enables to *recruit and develop* enough high quality staff, while an opposed fast-track merger creates countless problems arising from the resulting need to merge what has not grown together naturally. This especially affects the process of HR integration, identified as cause for several mergers being failed.

To give an idea about the duration that must be expected, the following four phases of integrating HR as extracted from Empson [r4] and presented in the next table may be helpful. The duration of any phase lasts for an average of one year, so that integration can be expected from the third year onwards. Until then, spending 10% of daily working time on communication must be expected [r11].

| Integrating HR: |
|---|
| 1. Initiation |
| 2. Acclimatization |
| 3. Transition |
| 4. Integration |

Table 18: HR integration — four steps in retrospection

If management has decided the question of intended merger duration, there are two basic scopes management must engage in, summed up in the terms *trust* and *information* here. As usual, I start illuminating the human aspects first:

Of course it is a well-known fact that humans basically do **fear changes**. Within a merger process, this is especially true: Employees are frightened about going to be *exploited* by 'the others', for instance. The reason for this kind of concerns may be that the own technical knowledge is valued more highly than 'theirs' or that the own, 'upmarket' image is over-valued in comparison to 'theirs' and therewith diminishes future reputation. Often concerns like this go together with the fright of expected *aggressive behavior* of 'the others' — as expressed by affected managers.

Solving this problem is easily achieved from theoretical perspective: Employees are usually less informed of the *decided* merger (including the *reasons* for this decision) than managers are. This information difference between the background of managers and employees needs to be eliminated before uncertainty and suspicion can clear the way for transparence:
While managers already decided the merger (and are familiar with it), employees are basically uninformed about this decision (and feel confused at first). Trying to provide a preferably good kick-off, managers must **inform** employees in two ways: *as soon as possible* on the one hand and *honestly* on the other. This is achived by *involving* employees into the process of merging processes. Many authors recommended to "involve staff at all levels in information gathering and integrating planning" [r4]. This leads to the following *key features* of the communication process:

| The "key features" of the communication process (sample [r11]): |
|---|
| 1. Rapid communication of information about the acquisition as soon as it was announced |
| 2. Convening of meetings to answer questions and allay fears |
| 3. Quick decisions about what would happen to the various units |
| 4. International team meetings where both sides get to know one another |
| 5. Retain as much of personnel as possible |

Table 19: The "key features" of the communication process

**Communication culture** probably needs *instant improvement* as a resulting precondition. If so, this process must be initiated by top-management and seriously monitored. As a good start, they make employees *understand* the reason for this strategic decision, probably underlining the fact that there is *no way out* of the merger whereas "it is vital not to lie" [r4] simultaneously. It is recommended frequently by various authors to "articulate and encourage a credible *vision* of the future" [r4]. Some authors prefer a *strategic culture* to be developed, instead [r2]. Merging this ideas to a vision of evolving communication culture would have significant impact on chosen strategy of communication. Achieving this goal is simple: Since management must have substantiated reasons for its decision, these reasons are part of the vision the management has for the enterprises' future. Formulating this vision and transfering the knowledge about it to all employees could indeed establish a merged communication culture. To prevent misunderstanding, the achieving of this goal is simple in theory and its realization a *fine art*.

A proper communication culture would reveal beneficial for both sides in the next place: A transparent flow of information is precondition for measurement monitoring and clarified responsibilities. This information could be used to *plan* the pending integration process and is presented as a "*must*" [r2]. At a minimum[14] this plan should embody answers to the questions "when?" and "how?", not neglecting to point out the necessary of frequent reviews. This is to

[14] for extended proposals please look at Lajoux [r2], Chapter 3 (pp. 45-75).

be done for all major resources, assets, processes, commitments and responsibilities. Still, referring to Lajoux, this plan should also include a definition of the new company's goal(s) and how the integration plan will support the achieving of these goals. It is emphasized that existing (HR) management systems must be considered [r4] as well as any kind of reporting patterns need to be united for achieving appropriate control of the established efforts. At last, a priority list and a timetable are desirable [r2]. It is not essential to do any activity as planned but to prevent from getting "caught up in the day-to-day affairs of the unit, which makes it hard to focus on the more *global issues*" [r11].

Undertaking all this communication will demonstrate the management's intention to "shows firm's *face* and prevents from demoralization" [r4]. This makes it obvious for employees that management is actively sharing integrating activities as well. Moreover employees will feel secured that there is a *future* for them.

Due to the fact that the "human side of mergers and acquisitions (Buono and Bowditch, 1989) is frequently neglected by managers' intent on doing the deal and realizing operational synergies" [r11], it is important and about time for managers to realize that "long-term success [...] can only be achieved through process management, effective communication and sensitivity to the concerns and expectations[15] of individuals on both sides of the acquisition" [r11].

Especially **meeting their counterparts** is of high importance for this reason. To prevent employees to be trapped in the "High School-Dance" phenomenon (remember section 3.2.4.) it is helpful for management to "identify potential *integration entrepreneurs* and help them to find each other" [r4]. The advice is to "ensure that most 'user-friendly' colleagues meet staff at the merger partner firm as soon as possible, and encourage your less amenable colleagues to direct their attentions elsewhere." [r4] Of course, some people manage to adapt structural changes quickly, some will need a longer time and others never will. And even for those kinds of people there is an existing advice: "Reassure recalcitrant staff and allow them time to adjust" [r4]. But: "reassign or dismiss remaining resisters and saboteurs" and "intervene to discourage them" [r4].

Concluding this section, it is important to point out that management impact on the merger process is especially found within its beginning. The resulting character of this impact is of crucial nature, determining the merged companies future structure and success. And so the merger-initiating key challenge of management can be summed up within following statement:

> "The key challenge for managers of merging professional service firms is, thereforee, how to persuade highly autonomous individuals to share their technical knowledge and client relationships (which represent their primary source of power within the firm) with their merger partner colleagues at a time when they may be anxious about the prospect of merger-induced change." [r4]

But this advice seems to be of alternating importance concerning the varying culture of different nations. Following sub-section will compare detected differences within national management practice and therewith give additional hints where for management impact.

[15] please notice that expections of millionaire employees may not be of material kind [r65]

#### 3.2.6.1. Management by nationality?

It is beyond doubt that culture varies from country to country and continent to continent. So it might be interesting to know that management culture varies from Germany across France to England and especially varies when looking across the oceans via USA and Japan. Fortunately one particular study [r27] dealt with the question of *inter*-national takeovers. It must be pointed out explicitly that the study is presented from UK point-of-view. Nevertheless, its findings are extracted as follows.

While the **German** management practice is basically long-term orientated, employment philosophy surprisingly is not. There is a strong technical and production emphasis detected while managers and staff usually tend to remain within one functional area usually. Classic German mentality mirrors within the high degree of formalization, with an extra emphasis on operational planning, procedures and rules instead of participated, collective action.

A look across the national borders finds out that **French** management preferably orientates on strategic rather than financial belongings. Managerial components are a significant part of traditional tall organizational hierarchies while a high degree of specialization is detected and written media are widely used. The situation of management in the **UK** looks entirely different: while there are large general management super-structures detected, financial orientation is basically short-term. This short-term orientation insists on a high mobility of managers between functions and a frequent use of formal meetings, especially committees.

The differences in management practice increase when taking the US and Japan into consideration, too: While financial orientation in the **US** is strictly adapted from the UK source, there is a high reliance on formalization and systems delegation down extended hierarchies. US firms make much more use of the advantages arising from a high rate of job change and *inter*-company mobility while an emphasis on analysis and planning provides the basis for realistic approaches to problem solving and a reward system that is related to specific performance indicators. **Japanese** management looks exotic from this point-of-view: Any (strategic) perspective is long-term orientated with a priority on growth and long-term employment. Strategic goals are of higher value than financial goals, supported by flexible tasks and an emphasis on teamwork and knowledge sharing. This is seen as basis for continuous improvement while there is centralized, *final* approval of decisions and an over-all collective orientation of the entire enterprise. These characteristics are supplemented by a high focus on internal training and close relations with suppliers and customers.

Quality experts already noticed that actual management tenets are highly influenced by this classical Japanese management practice that already entered various international frameworks of quality as, for instance, the popular ISO-9000 series.

These findings enter the following, consolidated tables, taken from the same study to enable a full overview. The first table presents *little*, the second *similar* and the last *apparent differential* impact of reported, post-acquisition change between nationalities:

| **"equal"** national Management practices with only *little* national differences |
|---|
| ‣ Job rotation of managers between different functions |
| ‣ Scientific or technically qualified staff as a percentage of total employment |
| ‣ Emphasis on formal qualifications for selection and advancement |
| ‣ Employment philosophy — recruitment and termination: short-term vs. long-term |
| ‣ Approach to promotion: slow vs. rapid |
| ‣ Methods of distribution: sub-contracted vs. internal |
| ‣ Customer involvement in making decisions |
| ‣ Emphasis on managing the total supply chain |
| ‣ Degree of outsourcing |
| ‣ Range of suppliers (single source / multi source) |

Table 20: "Equal" national management practice.

| **"similar"** national Management practices, emphasis on underlined subject |
|---|
| ‣ Strategy: competing on price; offering unique products/services; development of new products/services |
| ‣ Amount of training |
| ‣ Reward systems: performance-orientated vs. annual increments |
| ‣ Level of image projection |
| ‣ Communication philosophy: open vs. need-to-know |
| ‣ R&D / product development: team-based vs. sequential |
| ‣ Use of IT and automation |
| ‣ Cost control |
| ‣ Operations: employee responsibility for quality; continuous improvement; group working / work teams |

Table 21: Similar national management practice.

| **different** national Management practices | nature of difference: |
|---|---|
| ‣ Formal meetings | ‣ German acquirers: fewer |
| ‣ CEO appointed by acquiring company | ‣ UK acquirers: 78% of cases<br>‣ US acquirers: 53% of cases<br>‣ Others: < 50% of cases |
| ‣ Sales and marketing director appointed by acquiring company | ‣ US acquirers: more likely than others |
| ‣ Managers without mainline functional portfolio appointed by acquiring company | ‣ Japanese acquirers: more likely than others |
| ‣ Capital expenditure requires final approval by parent company | ‣ US acquirers: 75% of cases<br>‣ Others: 89% of cases |
| ‣ Use of financial control systems | ‣ French, US and UK acquirers: considerably more use<br>‣ German and Japanese acquirers: somewhat less use |
| ‣ Communication mechanisms | ‣ German acquirers: less formal<br>‣ Others (especially US): more formal |
| ‣ Primary orientation of the subsidiary | ‣ Japanese and German acquirers: more strategic<br>‣ UK and US acquirers: more financial |

Table 22: Differences in national management.

The common changes like a shift towards performance-related rewards and a stronger emphasis on quality probably reflects general trends among companies in response to competitive pressures and to the evolution of management thinking. Besides, the findings may be summed up for a German focus as follows:

**German management practice** in the acquiring process made "much less use following acquisition of formal meetings, had less formal planning, made less use of financial control systems, had a less planned approach to career development, used formal communication mechanisms less, and placed less emphasis on a cost control strategy" [r27] in comparison to the rest of the sample. This aligns with the impression that German managers "are *specialists* rather than *generalists*, at least compared to Japan." [r27] Like all other nations, German management practice does not pay attention to monitoring activities guiding all activities (or processes) as a matter-of-course. The only exception to this was found in the Japanese management, where management tried to teach "through example and encouragement" [r27] to achieve the desired goal of *implicit control*.

This led to the conclusion that the "German parent companies exercised relatively less influence over their acquisitions" [r27]. Moreover it is found out that "German parents have often supported their UK subsidiaries financially *without attempting to integrate* them into their own operations." [r27]

> "One of the most characteristic aspects of the German culture, which certainly strikes an outsider, is their way of managing uncertainty through an emphasis on planning and orderliness" [r27], which is "manifest in organizational structures rather than in processes" [r27].

However, it must be realized, that although "the Japanese approach is likely to be superior at effecting change via a transfer of tacit knowledge, and the US approach better at effecting change at the explicit level" [r27], "there is *more than one way* to develop value from acquisition" [r27]. The goal of this sub-section is to give ideas where German management practice could probably be improved and that there is the possibility of management to include itself into the merger guiding re-structuring activities. This truly could improve the existing communication culture for a start.

### 3.2.7. Seven steps towards corporate strategy [r19]

As frequently stated before it is strongly recommended to build up a *vision* and create a (communication) *culture*. But what is the role of strategy between this "soft" terms then? In my eyes this is plain to see: While vision is a term of non-concrete kind and its job looks like that of a lighthouse, a culture refers to the daily and casual conversation. Into this culture it is possible to introduce and manifest a strategy to reach above-mentioned vision. So in short there is a kind of value-adding chain of these terms: an existing culture of communication is seen as essential fertile soil to establish a well functioning strategy, which is recommended to have by the broad majority of investigators dealing with this question. Especially in case the enterprise in question tries reach a distant vision.

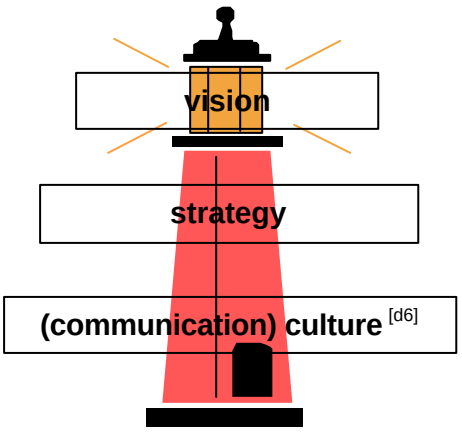



Image 11: Culture, strategy & vision.

The seven recommended steps for achieving an effective corporate strategy are summed up and presented in following table, completed by a few comments.

| Corporate strategy: An action program in 7 steps [r19] |
|---|
| 1. Identifying the interrelationships among already existing BUs (see section 3.2.8.) |
| 2. Selecting the core business that will be the foundation of the corporate strategy |
| 3. Creating horizontal organizational mechanisms to facilitate interrelationships among the core business and lay the groundwork for future related diversification |
| 4. Pursuing diversification opportunities that allow shared activities |
| 5. Pursuing diversification through the transfer of skills if opportunities of sharing activities are limited or exhausted |
| 6. Pursuing a strategy of restructuring if this fits the skills of management or no good opportunities exit for forging corporate interrelationships |
| 7. Paying dividends so that the shareholders can be the portfolio managers |

Table 23: 7 steps to corporate strategy

**Comments:**

3. This stresses the importance of "individuality" on a different kind. Most important here is the customer's view to individuality: He expects a product (or service) that fits *his* needs, desires and expectations on the one hand and he expects highly individual service on the other hand. Company's structure and strategy needs to fit these necessities for a very simple reason: no satisfied customer → no customer → no company → no job. Moreover management must understand and introduce the high importance of binding existing customers to the company and evaluate progress of this process [r62]. The Harvard Business video tape "Unternehmen im Blindflug. Warum traditionelle Maßstäbe in die Irre führen" recommends to use balanced scorecards to achieve this goal.
5. The necessity to establish a "crisis management" and its "task force(s)" to continuously provide the ability of being able to approach suddenly occurring challenges must be stressed and become a matter-of-course for every company. Note that this would create a *reliable* and *highly capable* measurement as a by-product of such crisis management initiation. Imagine, for instance, the finding that a very high percentage of your company's orders are processed by the task force(s) in opposite to regularly assigned BUs. This would point out the necessity for restructuring activities.
6. Creating an atmosphere for transparency is the essential basis to structural reforms and improvements and therewith will lead to long-term *satori*[16]

[16] [jap. for *enlightenment*, *illumination*]

### 3.2.8. "Value Chains" locate synergy

*"Every BU is a collection of discrete activities,*
*ranging from sales to accounting that allow it to compete.*
*I call them value activities."* [r19]

While various authors point out that synergies are hard to achieve, one study particularly deals with the *nature* of synergy. The intention is to give ideas about the *location* of synergies and how they could be exploited. But before this ideas can be presented, please take a look at following considerations. There are four elemental facts providing the environment for synergies to appear, presented and visualized in the following table and image.

| Preliminary considerations about synergy: |
|---|
| 1. Any kind of unit, for instance a BU, is nothing but a process, based upon a variety of sub-processes (or activities; these activities are named ***value activities***) |
| 2. Between these single sub-processes exist certain *links* |
| 3. These links provide the *basis* for the transfer of knowledge or the share of activities |
| 4. *Synergy might*[17] directly come out of the transfer of individuals' knowledge and / or shared activities |

Table 24: Preliminary considerations about synergy

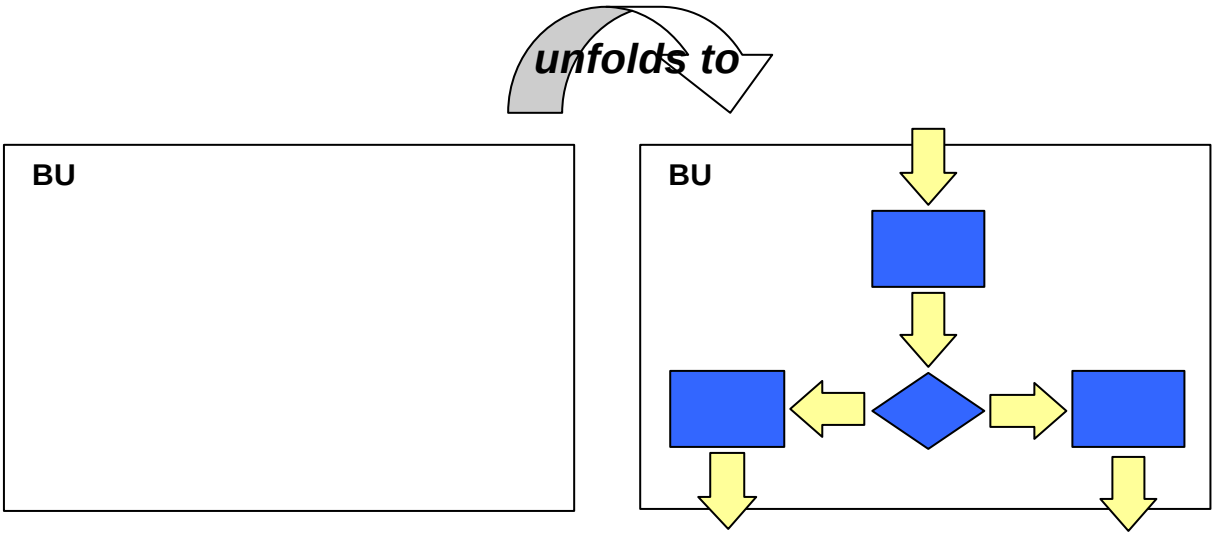



Image 12: BUs consist of a *chain of value activities*

In simplewords: BUs consist of several *value activities*, illustrated in blue, here. According to the author's theory, synergy can be developed everywhere *between* these activities, meaning that there might be six possibilities for synergy being achieved in the illustration above.

Moreover, these value activities are split up in two major categories: *primary activities* (create product or service) and *support activities* (provide input and infrastructure), detailed as follows:

[17] "two BUs, for example, *can* share the same sales force or logistics network." [r19]

| *primary activities* | *support activities* |
|---|---|
| inbound logistics | company infrastructure |
| operations | HR management |
| outbound logistics | technology development |
| marketing & sales | procurement |
| service | |

The value chain now defines the two types of interrelationship where synergy can be achieved, so that there are basically two different types of synergy:

| Synergy[2] — type (a) and (b): |
|---|
| (a) "a company's *ability* to transfer skills or expertise among similar value chains." |
| (b) "the *ability* to share activities." |

Table 25: Synergy, type (a) and (b).

I would like to illustrate the (a)-type of synergy by the following quote taken from the same study. It will show that synergy might even appear in between of a new health product (cough syrup) and an existing cosmetics BU. It is easy to imagine that the same logistic network already in use for the toiletries BU could be used for distributing the syrup, too, which would demonstrate the (b)-type of synergy in addition. Please note that both concepts are inter-linked to the corporate strategy [r19].

> Imagine: "A toiletries BU, expert in the marketing of convenience products, transmits ideas on new positioning concepts, promotional techniques, and packaging possibilities to a newly acquired unit that sells cough syrup.
> Newly entered industries can benefit from the expertise of existing units and vice versa."

In conclusion, the idea is that "while each BU has a separate value chain, knowledge about how to perform activities is transferred among the units." [r19] But there is an obstacle occurring that endangers the achievement of aspired synergies: These opportunities for achieving synergies arise only when BUs have "similar buyers or channels, similar value activities or procurement, similarities in the board configuration of the value chain (for example, managing a multi-site service organization), or the same strategic concept (for example, low cost)." [r19] The illustration below shows two BUs sharing a common service unit (red), which could be Accounting, Logistics, Data Mining, etc.

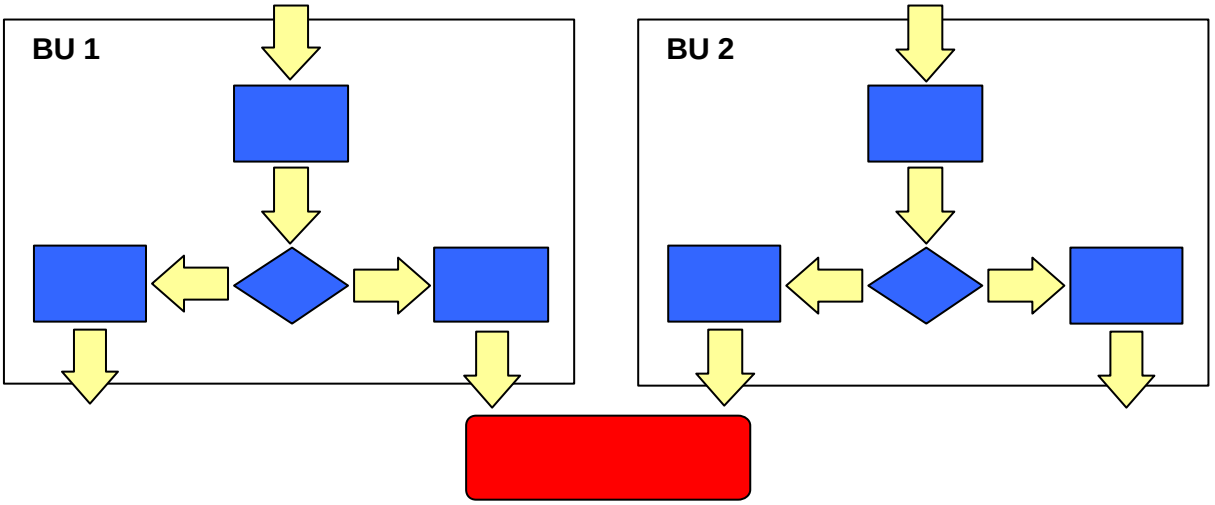



Image 13: Synergy (b)-type

To enrich the positive impressions arising from this idea, it is good to know that "even though the units operate separately, such similarities allow the sharing of knowledge."[r19] But, as you will have recognized carefully, certain *limitations* exist: "similarities" have to be detected, prior dealing with the achieving of synergies. Fortunately, the author of quoted study dealt with this question, finding out that "transferring skills leads to competitive advantage only if the similarities among business meet 3 conditions" which are concretely:

| Synergy preconditions |
|---|
| 1. Activities (b-type) involved are *similar enough* that sharing expertise is *meaningful*. |
| 2. The transfer of skills (a-type) involves activities *important* to competitive *advantage*. |
| 3. "The skills transferred represent a significant source of competitive advantage for the *receiving* unit. The expertise or skills to be transferred are both *advanced and proprietary* enough to be beyond the capabilities of competitors." [r19] |

Table 26: Synergy preconditions

In my eyes, the most interesting part concerning the idea of *value chain* is found concentrated in the following summarization:

> "The transfer of skills is an active process that significantly changes the strategy or operations of the receiving unit. The prospect for change must be specific and identifiable. Almost guaranteeing that no shareholder value will be created, too many companies are satisfied with vague prospects or faint hopes that skills will transfer." [r19]

So it is time to realize that synergy or even "the transfer of skills does not happen by accident or by osmosis"[r19] — it must be *done*. To achieve this *doing*, it must become part of the company's over-all culture, (quarterly?) strategic reviews and especially focus of management for instance. At least, this is my personal impression I share with the author's advice:

> "The company will have to re-assign critical personnel, even on a permanent basis, and the participation and support of high-level management in skill transfer is essential." And: "By using both acquisitions and internal development, companies can build a transfer-at-skills strategy." [r19]

At last, the linking of the terms "skill" and "strategy" by quoted study points out, that lots of responsible decision-makers seemingly forgot about the possibility to do so. This is the reason for the author to point out that "the need to re-think corporate strategy could hardly be more urgent" [r19]. Managers seem to favor formulating abstract lyrics and naming them 'strategy', instead of thinking of a possible *source* for synergies that might be exploited as major part of the over-all strategy of 'their' company.

Many of them still seem to evaluate the meaning of human individuals and company's structure not quite correctly: As already quoted in section 3.1.1.1. ("Human resources") already, management of "firms must recognize how *little power* they have to control the thoughts or actions of their most valuable assets like HR[18]" [r4]. Building on this thesis, the best way for management in achieving synergies is to start with the company's culture, then. Management can, just to give *one* idea, decide to integrate KM into communication culture and thus change the entire structure of the company. As just presented in section 3.2.7. ("Seven steps towards corporate strategy [r19]"), this culture will change the firm's strategy as well. Especially if the management's decision is to a very high extent built upon employees' advices, recommendations and information, synergy will more and more become part of corporate thinking and thereforee "evolve gradually" [r4]. Especially "the ability to share activities is a potent basis for corporate strategy because sharing often enhances competitive advances by lowering cost or raising differentiation." [r19]

Concluding this section of locating synergy, it can be summed up that concrete synergy can be identified where skills or expertise are transferred (synergy a-type) or activities are shared (synergy b-type).
In addition, management can decide whether synergy is intended to shape corporate thinking in the future in the next place. If so, existing processes need continuous investigation for improvement as constituent part of the company-wide communication culture. This can be seen as appropiate strategy to achieve the vision of future competitiveness.

After having investigated particular management considerations, the benefits that arise from having a value-adding strategy and the source for this added value, it is about time to present the over-all context in which all this can is achieved: the two-step merger of humans and processes.

[18] reminder: *individuals choose individually.*

### 3.2.9. Integration needs two steps!

We already heard about various recommendations pointing out the necessity of a kind of "two step" model for integration. These two steps are meant in exactly **five ways** I could identify and try to classify in this section. **First**, there is the recommendation to ensure that merger initiating management pass over their information to involved employees. The **next** advice concerning the two-step approach recommends to undertake a kind of "stock-taking" for each entity to be integrated prior integration. Although it may look paradox at first glance when Haspelslagh and Jemison [r11] recommend that "firms move to the state of symbiosis *through* one of autonomy" it is preferable being familiar to the integration entities instead of having knowledge of meager kind, only. In other words: "first, maximize the performance of the individual businesses[19]; second, integrate those businesses." [r11] Only if you know each unit to integrate *on its own*, there is a chance for over-all integration. In case of a stock-taking, "the integration process led to a *more realistic evaluation* of the relative strength of the two units." [r11] So it is recommended frequently to take a sober look at each entity in question prior merging it. This will help to generate a transparent overview for the merging operators involved into integration process. The **third** meaning deals with the (major) subjects or entities of integration, i.e. human integration and task integration. The advice is not to concentrate on one while neglecting the other but to do both in two (more or less) parallel steps.

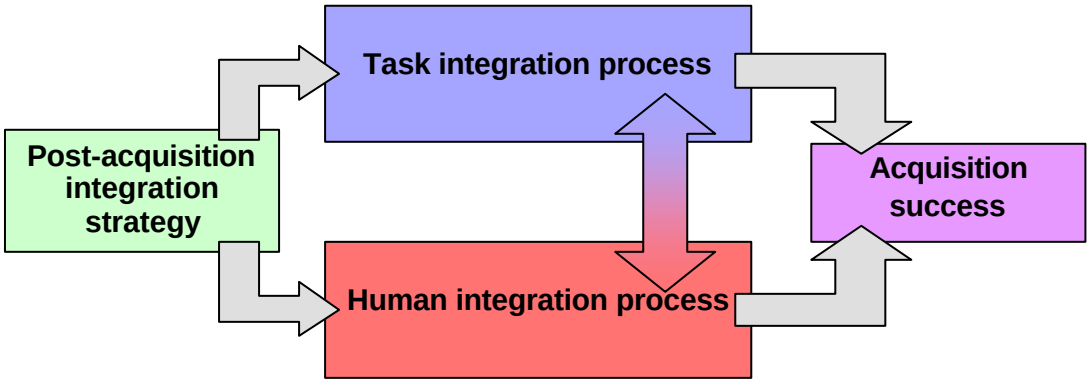



Image 14: Illustration of the two, parallel running integration processes.

This graphic is taken from the study "How the Human Integration and Task Integration Processes interact to foster Value Creation" [r11] and illustrates the findings very clearly: "Eventual acquisition success is a function of the two *parallel* processes of task integration and human integration." [r11] It is important to know the meaning of the two most important terms mentioned here exactly: "Task integration is defined as the *identification and realization* of operational synergies, and human integration is defined as the *creation of positive attitude* towards the integration among employees on both sides." [r11]

The **fourth** interpretation of the term directly depends on the preceding one: Mutual respect among employees provides an essential basis before synergies can be expected to be exploited. The **fifth** interpretation of this two-step idea has already been presented a several times: Integration processes should not be expected to reach the goal of integration within one seriously planned step. On the contrary, gradual evolving should be enabled. Some managers decided to let the integration phase never end. "Learning by doing" is one of the major important premises for merging activities and due to the fact that *people* never stop

[19] To maximize the business processes, BPI or ESP can be recommended

learning, the constructed *model* must be completed towards this desired feature. This alters the presented image in the following way:

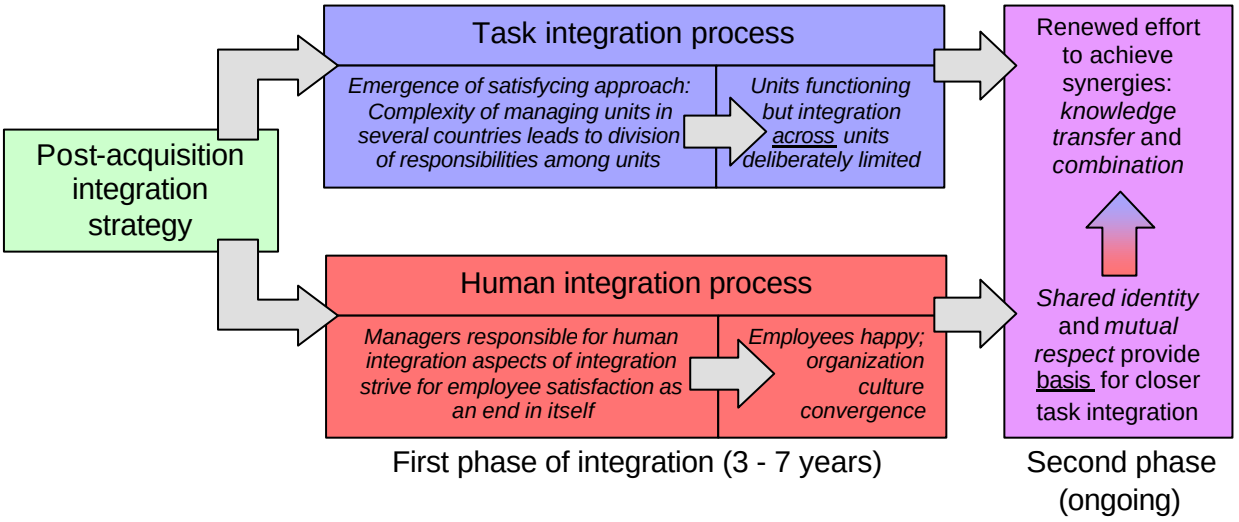



Image 15: Modified framework as induced from case studies.

After ensuring availability of a transparent look at the entities in question, focus is now on integration: But: "Given the task integration and the human integration require predominantly different management actions (combining and eliminating vs. building an atmosphere of mutual respect and trust), and focus on different objectives (operational synergies vs. employee satisfaction)" [r11] The *effective management* [r11] of these both sub-processes are responsible for over-all success of the merging activities.

As summarized in quoted study, the "[...] evidence suggested the emergence of a second phase of task integration beginning at roughly the same time that the human integration process *drew to a close*. This second phase led to the creation of much greater *interdependencies* between the acquiring and acquired units than before, and hence the eventual realization of the synergies that had been promised at the outset" [r11]

| "Two-step" for success! |
|---|
| 1. Informing the management must be followed by informing (affected) human resources |
| 2. Prior integration, a stock-taking of resources, processes and responsibilities should be performed |
| 3. Integration process consists of two parallel steps: HR and task / process integration |
| 4. Prior expecting to exploit synergies, mutual respect should be ensured among humans |
| 5. If integration is "over", restart to avoid "repeating the past" [r19] |

Table 27: Five times "two-step"

These five "two-step" recommendations provide flexibility of the integration strategy towards a multitude of unforeseeable events, problems and previously unrealized complexity of the entities in question. In general it is important to understand that "firms move to a state of symbiosis *through* one of autonomy" [r19] what prevents potential *bad failures* [r5] like unclear responsibilities or unwanted resignations.

### 3.2.10. QA: Ensure integration success!

Now that we know *why* a 2-step merger is a good recommendation, it is time to think about *a way* through this. The image presented below will show the dependencies between human integration and task integration as taken from Birkinshaw[r11]. If you want to become aware of the way to the aspired goal (i.e. "successful merger"), there are at least three ways (here: "trajectory") to success imaginable. These trajectories are numbered A to C:

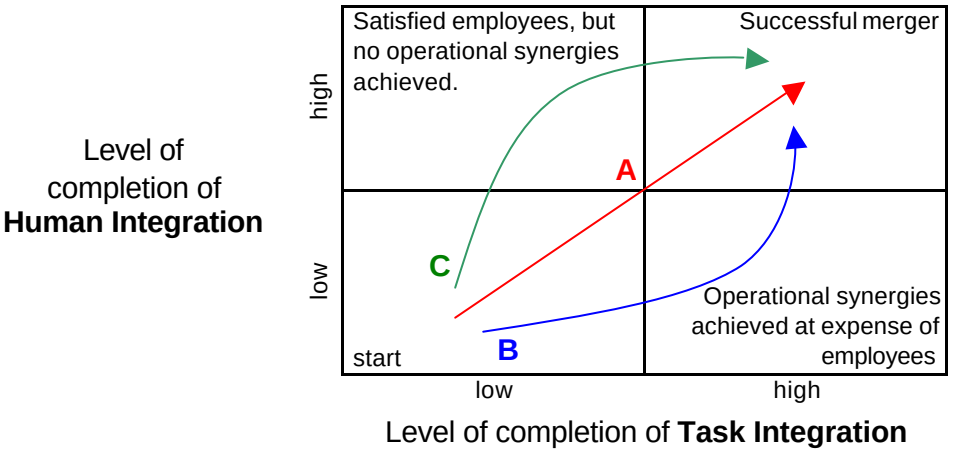



Image 16: Trajectories through human integration and task integration.

Trajectories:

A. from "start" straight and directly to "success",
B. from "start" to a high task integration and then to a successful merger or vice versa:
C. from "start" to a high human integration and then to a successful merger.

Although "the achievement of one ahead of the other could lead to a sub-optimal outcome"[r11], it is not recommended to simply pick out trajectory **A**: Referring to above mentioned figure, "trajectory **A** may be optimal *in theory*, but in practice the costs of ending up with trajectory **B** are significantly higher than the costs of trajectory **C** (equivalent to type I and type II errors)."[r11] The problem with choosing the "appropriate" trajectory is that it is unforeseeable whether the chosen road will be left for some reasons during integration process or not. "As a result, the risk-averse managers studied [...] opted for trajectory **C** as a more guaranteed route to success than trajectory **A**."[r11] This decision or option is supported by the following quote: "For the process to be entirely successful both task and human integration have to be effective, though [...] they can probably occur at *different speeds*."[r11] So the *reasons* for deciding trajectory **C** was the hope being able to "avoid confrontation in the first couple of years to ensure that they did not ruin their relationship with the acquired companies' [...] staff" and that management did "not want to force the integration they had originally planned when it became apparent how complex the development process was."[r11]

For the company as a whole it is important that the post-merger integration phase is performed accurately. *If* there is any benefit of the merger, it will occur here. To be more precise, "all value creation happens after the acquisition"[r11] Knowing this will lead to the enlightenment, that a controlling mechanism will be useful to ensure the achieved goal is still in sight.

But what is control and how can control be achieved? "Internal control means different things to different people. This causes confusion among businesspeople, legislators, regulators and others" [r2]. Referring a common definition of (financial) control by COSO[20], it is a process of effective and efficient operations, reliability of (financial) reporting, compliance with applicable laws and regulations. It consists of "5 interrelated components" which are presented in the following table and can be found unfolded in Lajoux [r2], Appendix 7-B for additional information.

| The 5 interrelated components of control |
|---|
| 1. Control environment |
| 2. Risk assessment |
| 3. Control activities |
| 4. Information & communication |
| 5. Monitoring |

Table 28: Components of control

Nevertheless, it becomes clear that the principles of control are always the same: coming together on a transparent base of information, exchange of ideas and opinions, evaluation, possibility of regulation, looped structures and the necessity not to loose interest in the subject being controlled over time.

In my eyes, it is a question of internal and external organization whether control can be achieved or not. For instance, "rapid communication of information about the acquisition as soon as it was announced" [r11] will provide the possibility for an exchange of information inside and across BUs. This is, of course, an inevitable step for making the new company more transparent, which is a precondition for control at last.

Moreover it is essential to *follow* the advices by controlling staff. Please take a look at the following quote prior continue reading:

> "The interviews [...] suggested that there had been some learning from the Holger project: Development for the next generation of process control systems was being undertaken in a series of *smaller* projects [...]" [r11]

*If* this kind of advice is brought to management and asks for (structural) changes, management should understand that (structural) changes always cost money and will need additional time, of course. But rejecting this advice might (a) cost even more money and time and probably (b) even endanger the over-all success of the desired merger.

My humble advice as someone who has studied lots of literature dealing with M&A would be to invent and create (= "built up") an *'Integrated* process control system"[r11] (=: IPCS), although I cannot give concrete advice about the nature of its components. Moreover I would like to add that in my opinion *nobody* knows what this could look like — the diversities of companies and their organizing structures are too different for a general kind of advice. But, for instance, *building on* COSO definitions as above, there is at least a framework available. Additionally there are some "tools" mentioned that can be found in Lajoux [r2] Appendix 7-C: "Benchmarking Postmerger Integration of Internal Control: A Sample Guidesheet".
This will help not to "forget" any integration entities (at latest by reminding when unforeseen problems are upcoming *during* building up the IPCS) and simultaneously provide a broad basis on which the particular needs of the companie(s) or unit(s) in question can be "engaged" or added. This quality aspect concerning integration is seen as concrete

[20] COSO = Committee of Sponsoring Organizations of the Treadway Commission.

introduction, only. They are completed by the general quality concerns as presented in chapter 4 and chapter 6.

### 3.2.11. Data mining

As recommended by Miles and Huberman [r13], the data analysis should proceed in an **interactive fashion**. Data collection and data analysis should be an interactive process, due to the subject of analysis: if the result from the merging activities is unforeseeable at least to a high degree, the arranged questionnaire(s) must be changeable over-time as well. Especially if changes in the merger process are foreseeable or simply do occur. Of course, this may conflict with comparability of data, but this problem can be bypassed, if questionnaires are not altered completely but *extended*, pointing out the necessity and / or reason for extension.

But **who** is to be the interviewee? The employees, of course! As read in some studies, customers could be interviewed, too, but this is quite problematic due to several reasons of practicability and data confidentiality. So I focus on questioning the employees only, here. And the first surprising subject may be that there are several possibilities of sub-dividing the quantity of employees: As based upon the findings of Empson [r4] and Birkinshaw [r11] there are "key individuals" on both side of the merging employees like particular *open-minded* individuals or *opinion holders*. They are very important to be interviewed: "In each case we also got the key individuals to fill out a worksheet (two on each side of each acquisition), to get numerical indicators of certain constructs such as the acquisition motives and performance." [r11] Here, the key-individuals were given a *separate* worksheet with the intent to give a feedback as to atmosphere and actual attitudes of their 'devoted' colleagues. It is helpful to identify these key individuals. For instance, they can be asked to dispense the questionnaires and monitor the return of them: "Our 'lead contact' in several cases took control of sending out and collecting in the questionnaire" [r11]

It is recommended, that interviews themselves do look like nothing but a table: they can be '*semi-structured*' to "invite the respondents to talk freely about issues that were set out on a pre-designed interview protocol" [r11] Of course, this creates **additional problems** like the questions of *confidentiality, applicability concerning regional and international laws* and especially the question of *trust*. If employees do not trust in interview mechanisms, no good data will be collected which makes the complete data collection useless. Although possible, audio recordings, for instance, are not 'allowed'. To collect the personal remarks anyway, "the two interviewers wrote separate sets of notes and compared[21] their impressions afterwards." [r11]

But what kind of questions can or need to be asked? To give an example, "the questionnaire asked about how individuals viewed the impact of the acquisition on their personal situation, their impressions of the other company, and their perceptions of various work practices in the company" [r11] which, at least, gives multiple hints for concrete questionnaire development.

[21] this 'reconciliation' is nothing but an example for upcoming sub-merger activities within a merger.

By allowing 'free speech' and 'table answering', a good mix of **qualitative and quantitative data** allows rich insight in actual integration process "as it unfolded" [r11] as well as "some relatively objective measures of the changes that had occurred over the 4 years between phases of data collection." [r11] Direct comparison was possible due to asking exactly the same questions again 4 years later. The second opinion poll was simply enhanced by additional, actual and up-coming questions.

Here are some examples for concrete questions asked in studied literature:

| Measurement proposals [r11] [r16] [r17] [r18]: |
|---|
| ▸ "Level of integration of acquired unit" |
| ▸ "Ongoing level of inter-unit communication" |
| ▸ Ask people whether they think that "the acquisition management team had previous experience in making acquisitions" or not |
| ▸ "Communication process during integration" |
| ▸ "Retention of acquired personnel"<br>("We ask managers to indicate what percentage of the acquired personnel they had retained, working from the hypothesis that a higher level of retained personnel would be associated with more effective human integration") |
| ▸ "Voluntary personnel loss"<br>(only qualitative measurement possible due to highly sensitive question) |
| ▸ "Change in personal situation"<br>(on 4 items: responsibilities, salary, work satisfaction and job security) |
| ▸ "Change in respect for others"<br>(on 5 items: technical competence, efficiency, market contact, technical resources and willingness to co-operate) |
| ▸ "Cultural convergence", what needs to be defined[22], of course, prior asking for it |

Table 29: Measurable questions as extracted from literature questionnaires.

My advice would be not to forget to ask for *personal impressions* to complete the collection of *facts*. Only if both, *hard* and *soft* measurement do overlap to a high extent you can evaluate investigated questions and given statements as *true*. Please note that following questionnaire concentrates on the collection of *hard* data. This example will end the section of data mining.

[22] every 'ambiguous' term needs to be defined clearly, of course

(Some) measurement proposals in 7 categories as extracted from [r36]:

1. Customer and quality results (levels and trends)
   - Customer satisfaction
   - Customer complaints
   - Product quality (initial, long-term and tending)
   - Product reliability
   - Process performance
   - Supplier quality
   - Product maturity
2. Quality leadership
   - What is the company commitment to quality (e.g. policy)
   - How is this communicated
   - Organizational structure for quality? (corporate-wide, BU level, ...)
   - Who looks at?
   - Who is accountable for quality and customer satisfaction results?
3. Strategic quality plan
   - Role of quality and customer satisfaction in business and product strategy?
   - What, if any (!), are the company-wide initiatives to quality and customer satisfaction?
   - What are the goals for quality objectives and ~goals?
4. Customer focus
   - How is customer satisfaction measured?
   - What is done to understand customer satisfaction and concerns?
   - How do customers complain?
   - What is the contract review process as it relates to quality and reliability?
   - What are the undocumented escalation paths, how are exceptions handled?
   - What customer support networks does Lucent belong to and should Ascend align membership in these?
5. Quality information and analysis
   - How is quality measured? (metrics, collection, frequency, who, communication of them)
   - What analyses are done? (including review)
   - What are feedback and corrective action loops? (how managed, ...)
   - Do customers require quality reports?
   - What processes are / should be in place to ensure data acquisition systems used are providing accurate reflections?
6. Human focus
   - What is the culture for quality? (attitudes, skills, etc)
   - What training is available? Required? (processes, models, tools, ...)
   - Are company-wide quality methods used?
   - Quality and / or customer satisfaction-related reward-programs used?
7. Process management
   - What are the key drivers for improvement?
   - What ISO registrations are in place?
   - Do you set quality and reliability objectives for products at general level?
   - Approach for managing and improving supplier quality?
   - What guidance is in place to manage the quality of work processes?
   - Plans for environmental management available?

Table 30: Measurable questions as extracted from Lucent questionnaire

### 3.2.12. SW tools

"Ich bin ein Computer — genau wie Du" (NEFKOM)

Hopefully you do *not* basically agree on introducing quote, sung by an extraordinary robot-voice[23] a few decades ago. Since over-all success of the post-merger integration process highly depends on the success of HR integration (as quoted extensively before), the decision whether a merger of frameworks should be done by a computer and its program or if humans should rely on an artificial decision support system must be questioned in general. Of course, this tools represent highly concentrated, human intelligence. They were invented from merging scope to support the merging activities. But mergers are highly unforeseeable (due to a multitude of reasons) and each company must decide whether its strategy prefers to support programs or humans for such activities.

In case the decision is to *use* these kind of artificial support, it is stressed that this decision might not necessarily influence the merging processes in a negative way. But whether it can influence this process in a *positive* way will be found out within the next sub-sections. Maybe the use of such tools demonstrates a certain kind of daring.

#### 3.2.12.1. "Quagmap"

The Quagmap-SW tool has been developed by the Software Productivity Consortium (=: SPC) especially to help merging operators to merge varying framework compliance among merging units. The tool provides a number of framework-to-framework mappings while the user may create further ones. The frameworks currently included in the tools database are the Capability Maturity Model for Software (SW-CMM), the Systems Engineering Capability Maturity Model (SE-CMM), ISO 9001, MIL-STD-498, J-STD-016, ISO/IEC 12207, MIL-STD-499B, EIA/IS 632, IEEE 1220, and ISSEP.

The tool provides the capability to *print compliance matrices* and *reports identifying gaps* in compliance. To give an example, the tool is able "mapping an organizational process to the SW-CMM and ISO 9001 and performing a Gap Analysis to ISO 9001" [r22] This sounds great only at the first reading. Continuing, the following limitation will point out why this feeling will survive a *first* reading, only: "To understand the gaps in compliance to ISO 9001, Quagmap identifies the gaps *and then you need to analyze them*. Quagmap provides a Gap Identification report, *but a knowledgeable person must analyze the gaps to draw the proper conclusions*." [r22] Moreover, if the desired framework is *not* yet included in the database, you must develop it. And, of course: "you must do the intellectual work completely for your first framework on your own." [r22]

In compliance with Sheard [r23] I hold the opinion that "Effective business processes are based on an organizational history in which processes that did not work were replaced by better ones, thus making the business more successful". Moreover, it is not enough to merge processes and forget about the people working with them. Even if processes *would* match, it

[23] Transit-Language-Computer was invented by N. P. Nev in 1972

would be useless for the company in case employees do *not accept* the outcome. They are the ones handling and performing these processes. But the major risk is seen in management, where an automated gap-analysis could make management forget that the merging process is *a fine art* and is highly depending on human individuality.

#### 3.2.12.2. "DSS"

Some experts [r30] even developed a hybrid **D**ecision-**S**upport **S**ystem for Business Acquisition Process (DSBAP) to ensure a successful merger. The idea is interesting: Two modules refer to (past) experience and (actual) exceptions to the rule. The first module is named case-based reasoning (CBR) and rule-based reasoning and is thereforee seen as *hybrid*. In case of conflict, RBR is dominant.

The intention of this computer-based tool is to help managers making their decisions by presenting available information and providing interpretations of various alternatives. The advantages of such a DSS are seen in cost savings, a good payoff and a faster decision process. Whether the statement of a "significant competitive advantage" is correct or not cannot be answered here and thereforee is simply mentioned.

The basis for such a system is a set of IF-THEN rules you are already familiar since the introduction. The rules meet the following format:

IF <precondition(s)> THEN <conclusion(s)>

Moreover, the DSBAP consists of three major parts: A *company valuation*, a *strategy formulation* and a *strategy modification*, completed by a *text-based* user interface. Although this system is based on good ideas with the purpose to enable transparency inside the decision process, it is unfortunately of "prototype status", only.

Maybe, presented ideas should simply enter your future KM system to ensure transparency.

# 4. Integration process & quality concerns

*"Es ist nicht gesagt, daß es besser wird, wenn es anders wird.*
*Wenn es aber besser werden soll, muß es anders werden."* *(Georg Christoph Lichtenberg)*

Probably, the major problem of integration is not the integration process itself. While reading dozens of studies dealing with the broad scope of M&A business and the integration process in particular, I always experienced similar impressions: The integration process was either *not started* at all, started to integrate *processes only* or was tried to be *pushed through* by the management. As an over-all impression, I would like to point out that affected managers apparently have problems in finding *the mediocre way* — especially when confronted with integration constraints. Often management is identified as either too leisurely in guiding the sub-processes of the merging activities (i.e. *too less* activity) or as too dogged in achieving perfectionism (i.e. *too much* activity). But management behavior like this endangers the over-all integration success since it prevents from achieving an *carefully initiated* and *softly guided*, organic evolvement.

In respect to the post-merger situation concerning QMS, this means that it is important to *enable* the *arising* of a common quality system by management throughout integration. In other words, while merging operators investigate the nature of pre-merger entities, they automatically establish an over-all, bi-directional information highway system as illustrated in image 28 ("Integration information structure"). Following the inter-relationship of quality and transparency then, this information highway should (and could) be exploited to erect a united post-merger QMS. This procedure is useful no matter whether the amount of existing QMS(s) is *zero*, *one* or *two* as illustrated in image 5 ("Merging quality objectives") already. When merging operators make up their minds about how existing entities (esp. processes and human responsibilities) are to be merged, this information could basically shape the post-merger QMS in addition. Of course, this will determine the communication culture of the post-merger enterprise in a positive way.

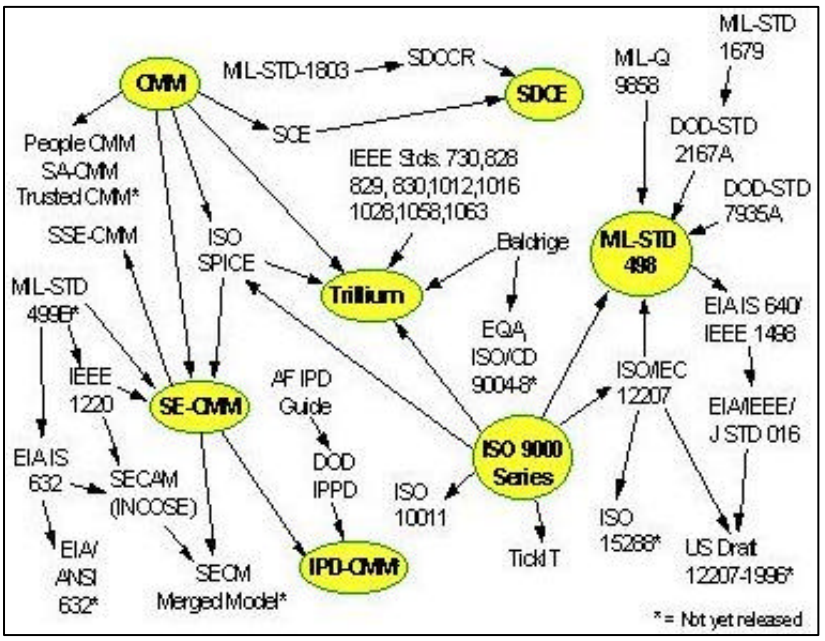



Image 17: The frameworks' quagmire

Finally, in case the post-merger QMS is intended to arise gradually from the integration process, it is obviously attributed to *organic* growth as well as the integration processes, itself. Organic evolvement is frequently postulated by various integration experts as already hinted before for the reason of enhanced flexibility and stableness.

Beyond doubt, the post-merger enterprise should have a QMS. Such a system provides the basis for the organization to remain competitive these days. Due to altered customer habit, where suppliers underlie customers' postulation for quality products and services, the reason for achieving this quality constraints often forces organizations to comply with all possible contractor evaluation criteria, process models, and quality standards. In consequence, erecting such a common QMS must be evaluated as mid- to long-term investment into the enterprises' future.

Unfortunately, the question of the nature of such a desirable post-merger QMS cannot be answered in general. The reason is easy to understand when taking a brief look at the existing *frameworks quagmire* [r22] — which of the existing frameworks do you choose and which of them do you assume to fit the forthcoming challenges the best? Deciding and prescribing the answer to this question can only be undertaken by top-management in arrangement with quality staff of both pre-merger entities.

Although specific recommendations concerning the merger of existing QMS are hardly available, I decided to include some general quality guidelines into my elaboration, instead. This is needful for supporting my hypothesis that integration, undertaken under common aspects of quality, will promise a siginificantly higher success of integration as trying to integrate entities without assuring quality.

Taking a look at the actual situation of (German) companies, a broad lack of quality awareness must be detected. To give an example of *how bad* actual quality awareness really is, understand that from a sample of 140 verified German banks only 1.5% were able to calculate a credit offer that fitted clearly postulated requirements. And so the next two sections will underline the important role of quality within global competition, starting with a study by the Bundesministerium für Bildung und Forschung (=: BMBF) and completed by a sequence of representative, individual cases. Then, some major quality frameworks are presented to show a way out of this quality lack.

## 4.1. Bundesministerium für Bildung und Forschung (German authority)

Starting in 1992, this German Authority initiated a spanning collaboration of and between corporations and institutes. The goal aspired was to provide knowledge about quality and the realization of integrated quality assurance systems for national enterprises to strengthen their market position an ~share. To realize these goals, a lot of basic research was done dealing with the topic and the multiple definitions of the term "quality". A second undertaking was to create various joint-ventures and strategic alliances between corporations and institutes. This provided results for a practicable implementation of quality management (=: QM). A third activity dealt with the subject of learning knowledge — and a project group called "knowledge transfer" was invented for everybody to profit. It is important to notice that members of this group were from various research streams like the schools of social- or computer-science and the schools of psychology and law.

Concretely mentioned are the disciplines of *QA*, *KM*, *TQM* and *kaizen* as promising tools to establish and achieve the goals of quality. Although frequently implemented in the US and especially in Japan, a lack of realizing its *necessity* has been identified in German management. This behavior endangers international competitiveness of German companies beyond doubt. In this study [r38] several results and recommendations are presented, aiming to close the gap of quality knowledge. One benefit from such increasing quality awareness is to be found in failure-free production. Further reasons for choosing the way of quality are to be find within section 4.3. ("Choosing the way of quality").

These reasons provide a first access to the enterprise when business processes are to be improved for the sake of achieving quality. The results of seven BMBF research groups are presented within the next sub-sections and will give useful advice where the existing is suggested to be altered.

Hopefully this national initiative will help to get Germany out of the service and knowledge gap: A common fact is that the topics of **QA**, **KM**, **TQM** and **kaizen** *inter-relate* to each other: Quality needs knowledge and knowledge needs continual actualization for instance. In section 4.2. ("A sequence of confirmation") you will see that the actual situation of national enterprises is still bad. Concerning the topic of QMS again, this section will point out that less than 20% of all German companies *have* such a system at all.

### 4.1.1. Results of research groups:

#### 4.1.1.1. Group: "Interactions between QA and organization"

Implementing QA in a company will only follow a complete and over-all re-structuring of the enterprise in question. Principles of integrated and preventive QA follows three basic activities:

| The 3 basic activities prior implementation process starts: |
|---|
| ‣ Identify the necessary changes in organizational structure<br>‣ Show existing obstacles for organizational changes<br>‣ Invent ways to sail round these obstacles |

Table 31: 3 basic activities for organizational changes

These are the results from the investigation, that daily practice of QA is interspersed by a multitude of inconsistencies that lead to a sub-optimal situation of quality in general. For instance, there is broad agreement among scholars and companies as well, that quality highly depends on the employees: They need high qualification and motivation to assure quality in their every-day practice. Achieving such a goal needs continual teaching over time. Additionally, eventually undertaken changes underlie the short-term pressure of expectation, which is, of course, counterproductive.

Without fail, this leads to a scenario of disaccords for each and every employee: On the one hand, they should face the new challenges of QM self-dependent and cautious, and on the other hand they remain within unchanged organizational structures with all their traditional roles and competences. This leads to uncertainty, overcharge and stress. Employees loose their motivation and aimed goal is not reached — only satisfied employees can produce quality [r21].

In short, a solution to this problem can be found in six basic structural changes:

| The 6 basic structural changes (overview): |
|---|
| 1. Establish the principles of *self-organization* and *decentralization*<br>(autonomous, small units are of manageable size and so they are able to optimize structures in a continuous way)<br>2. Define new behavior patterns towards superior colleagues<br>(coaching instead of instructing, open communication and team-based decisions)<br>3. Ongoing and looped processes of additional qualifications for every employee<br>(they are the ones using knowledge and serving the customers)<br>4. Salary restructuring, continuously rewarding the enhancement of process quality, the flexibility of processes and the timely and technical diversity of employees.<br>5. Inspect your companies' interfaces<br>(based upon value-adding business chains, inter-company cooperation is essentially built upon the (desirable) closeness of personal relationships)<br>6. Ensure small units' (like BUs) need to *participate* to quality knowledge in two ways: personal capacity and external expertise |

Table 32: 6 basic structural changes

All of this findings are consolidated and presented in the book "*Organisation und Mitarbeiter im TQM*" (Springer-Verlag, Berlin) by Hartmut Hirsch-Kreinsen much more detailed.

#### 4.1.1.2. Group: "Logistic QM"

A major part of Germany's costs to assure quality has been identified from the unability to master logistic processes and courses. Here, the recommendation of quoted study is easy: Generally avoid thinking in functional borders and make processes and functions transparent, instead. In addition it is recommended not to concentrate on the external interfaces but to consider the internal interfaces (i.e. *Intra-faces*) as well.

This goal is achieved the easiest in case a consistent table of terms and specification is created prior building up a common information system in result. The compilation of customer and supplier vocabulary enables such a system to base upon the principles of Quality Function Development (=: QFD) and Fehlermöglichkeits- und Einfluß-Analyse (=: FMEA) in a next step. All this could result in a model of process chains, finally evolving to a SW tool. Processing like this, the logistic processes should be manageable in future.

#### 4.1.1.3. Group: "KM-based systems for QA"

QA is identified to rely highly upon the interrelationship of every unit involved in the process of quality: Solutions must *base upon* knowledge, the knowledge needs to be found where *needed* and it must help to *decide* in decisive processes. The *way* of knowledge development is recommended to go "bottom-up" from praxis to planning, while the *structure* of such a system should base upon sub-systems. These sub-systems could be Quality Function Development, Process Regulation, Causal Processor (cause→effect identification), Fault Analysis and Data Mining, for instance. Additionally and moreover it is necessary to include methods of job-orientated access to the data for the sake of high and *broad* acceptance and benefit.
All of the sub-system's data need to be allied in an over-all product and process model, resulting in a relational (or threedimensional) database. For a practical and pragmatic approach there is the possibility to start by building up an intra-net, evolving to a "knowledge net" and resulting in KM[r66].

All of this findings are presented much more detailed in the book "*Wissensbasierte Systeme in der Qualitätssicherung*" (Springer-Verlag, Berlin).

#### 4.1.1.4. Group: "QA in service fims"

To achieve a systematical organized QA, it is inevitable to have information about the actual situation of the company. A "stock taking" could provide the information to create a service typology. From this empiric typology, quality attributes could be deduced and extracted to create QA methods.
It is worth to notice that empirical collected data needs an additional integer, measuring the maturity of the data. This maturity integer is a measurable figure for improvement on its own.

These findings are presented in the book "*Qualitätsmanagement für Dienstleister*" (Springer-Verlag, Berlin) more detailed, too.

#### 4.1.1.5. Group: "Quality information systems"

It is essential for the realization of demanded quality that employees are (willing and) able to participate from such an information system. Failing this, everybody sustains his own definition of what he calls quality.
The streams of quality information arise from R&D, production, marketing, design, distribution, customer relation and disposal, for instance, and give hints for the design of desired quality information system. It must be mentioned explicitly that peculiar design constraints in respect to failure-reporting patterns and psychological facts need to enter this system, too. Of course, all of this information could be united in a software.

Again, these findings are presented in a book titled "*Qualitätsinformationssysteme*" (Springer-Verlag, Berlin) more detailed, too.

#### 4.1.1.6. Group: "Failure-free production all over the business chain"

It is no secret anymore that failure correction costs a lot of time and money. But more meaningful than these *direct* costs they cause are those arising from delayed delivery and other harassments of the production process: Employees needing to work as a "fire fighter"[24] are unable to do their regular job and cause additional failures. It is time to change from fighting problem consequences to *solving* the entire, complete problem [r61]. Otherwise, regulating activities will cause new problems elsewhere in the process chain. So the over-all solution can be found in a company culture that is devoted to the *desire* of solving problems — practically orientated and pragmatically implemented.

Mentioned research group soon founded three further sub-groups called "Failure prevention by quality planning and direction", "Failure prevention by improvement of process compliance and preventive QA within macro process chains" and "Failure correction in micro process chains". Their findings became basis for the book "Null-Fehler-Produktion in Prozessketten" (ISBN 3-540-60504-5) you may take into consideration for achieving a deeper insight.

[24] By the way: German employees just reached a new highest-ever of their overtime working hours in the year 2000...

#### 4.1.1.7. Group: "Quality control"

In this last group of research, investigators invented a new an innovative idea for quality-based company supervision. By combining traditional methods from controlling and QM, four sub-groups soon were founded. They were named "Design product quality from customer's point-of-view", "Quality-based personal controlling with figures", "Tools for operative and strategic quality controlling", "Quality controlling by quality techniques" and "Designing processes with respect to quality".

The findings of these project groups simply are too detailed to enter this elaboration. To give a brief idea, a relationship between product quality, the product evaluation and the customer benefit, for instance, was identified. By this cognition a diversified term of quality became the basis for the possibility of rating quality. Further more, another group identified the necessity to include cost-&-profit analysis into the development process of reference numbers, while another group dealt with the effectiveness of quality techniques and their assignment to specific processes.

Of course, these findings can be studied in the book "*Controlling im TQM*" (Springer-Verlag, Berlin).

#### 4.1.1.8. Collaboration with DFG

In addition to the presented research groups, BMBF collaborated with the renowned Deutsche Forschungsgemeinschaft (=: DFG) to provide actual input to the basic research stream concerning QA. This research streams are named "Chained information systems", "Quality regulation circles" and "Preventive QA methods" and provided new theoretical aspects to the discipline of QA at research drew to a close.

To give an example, the development of knowledge-based quality information systems could be achieved by pointing out the relationships between failure definition, failure origin and failure reproduction. A further improvement was identified by pointing out the possibility of regulation mechanisms in circular structures, where product quality was defined to be the unit of measurement. In surrounding of preventive QA, the possibility of planning quality on hypertext-basis was stressed.

All findings are presented in the book "*Innovative Qualitätssicherung in der Produktion*" (Beuth-Verlag GmbH, Berlin) by T. Pfeiffer and F. Hollamann, if you desire a closer view.

## 4.2. A sequence of confirmation

The national initiative presented above to propagate the blessings (and possibilities!) of QA was highly necessary. To give an idea about *how* necessary it was, I included this brief section, summarizing just some facts from an actual telecast[r21] by Germany's national TV program.

- When US company "Land's End" wanted to establish *total customers satisfaction* at their German branch, they never expected trouble with German authorities for this idea. But as a matter of fact, the act of competition (by Emperor Wilhelm II, 1909) still prohibits in Germany what is legal in 174 other countries of this earth. Land's End sell their ideas of a total satisfied customer via internet, now. And, of course, in Germany, too. The *illegal idea* in question was nothing but the corporate strategy to add a lifetime guarantee on all offered products.
- Highway bridges need permanent inspections and repairs, of course. German government pays 90 million DM to repair *one* of them while Italy needs just 3 million DM to repair *all* the bridges *across* Italy. Please understand: *all over* Italy. The high difference arises from two major differences: German bridges are built with taxes and DIN conformably. Today, German engineers know (as quoted in mentioned telecast): "...und genau diese Normen waren falsch" and so lead to construction deficits as source for frequent repairs.
- Stiftung Warentest examined German banks and credit institutes. 140 of them were asked for a certain credit and exactly *two* of them were able to calculate an appropriate offer. 2 out of 140? That is less than 1.5% quality assured work across German credit institutes.
- Every new car in Germany needs to be inspected after 3 years by German TÜV or DEKRA for the first time. This becomes a playground for image and reality to collide: "nach den ersten 3 Jahren kommt dann ein Ergebnis heraus, das sich so ungefähr auf die ganze deutsche Industrie übertragen lässt: wir sind nicht die Schlechtesten, aber andere sind oft schon besser."[r21] (F. Wallisch, QM Engineer at TÜV). The "top ten" was entered by seven Japanese, one Swedish and two German cars, ranked 3 and 8. No BMW, Audi, VW, Porsche. But: "... in unseren Köpfen sind wir immer noch die Grössten!"[r21]

I could extend this list endlessly. But although it is not part of my work to point out all the existing problems in this country, it is absolutely necessary to stress the *existing* lack of quality and its results: waste and frustration on customer-, employee- and management side!

Confirmation for this thesis is obtained by a subdivision of renowned Frauenhofer Institute called IPA: They interviewed 2000 companies across Germany to get some recognition about the quality situation within this country. Here some extracts from their results, presented by C. Mai (IPA):

| Some facts about the situation of quality in Germany: |
|---|
| ‣ 70% of investigated companies engage in customer objections — 30% do not |
| ‣ 70% bother for correct delivery — 30% do not |
| ‣ Less than 50% are interested in satisfying their customers — 50% are not |
| ‣ Less than 20% care for happy employees — 80% care not |
| ‣ Less than 20% have a QM system — 80% have not |

Table 33: Status Y2k: Quality in Germany.

It is no secret that only happy and motivated employees can produce quality work. And quality is an essential precondition for a perfect after-sales service. But a lot of German companies are either extremely uninformed or extremely immune to the challenges of the future.

So are national politicians are. And probably the impact here is even more disastrous: Although there is a German counterpart to the Malcolm Baldridge National Quality Award, initiated by Ronald Reagan for the US, the annual Ludwig-Erhard-Preis is neither attributed to the German President[25], nor is it presented in public. In result, it is at least to a large extend *unknown* and therewith to a large extend *meaningless*. The only result I can extract from this, is a further quote from the telecast:

"*Fazit:* Für Qualität sind die deutschen Politiker nicht zuständig." [r21]

With respect to the fact that quoted telecast was broadcasted last year, the actuality of the presented data and information still must be evaluated as high. As well as the necessity to establish quality objectives in *individuals' minds.* So it is about time to chose the way of quality and meet the major challenge of the forthcoming decade.

## 4.3. Choosing the way of quality

Prior choosing the way of quality for your enterprise, it is recommendable to know the reason(s) for this decision from an abstract point-of-view. According to Haist [r52] there is not just one, but four major reasons to manage the entire enterprise on the basis of quality assurance:

| Reasons to chose quality: |
|---|
| 1. Enhanced competition |
| 2. Increasing customer expectations |
| 3. Changes in society |
| 4. Increasing complexity of the products and services |

Table 34: Becoming aware of why quality is an essential investment into future

[25] J. Rau has *expressively refused* to take over patronage from predecessor R. Herzog.

Illustrating these items, it is of major importance to realize that competition is no longer bounded by regional limitations and borderlines. The "Four Tigers[26]" for instance are serious and mighty competitors, today. And their products and services are not of lower quality anymore, as the situation may have looked alike decades ago. On the contrary, Asian enterprises often are built upon the principles of kaizen and TQM the western world actually tries to adapt. But related to the question of time it is important to realize that Europeans actually still are in behind (in respect of quality implementation) and that our disadvantage is their advantage. Related to customer expectations, the traditional Asian philosophy of holistic thinking led to increasing quality manifestation in products and services, operability and reliability. Even in this area, the Europeans are still in behind. This situation evolves problematically since "customers care the American way" [r58].

But it is not only a lack of a common philosophy that forces Europeans to re-structure business and especially the way of thinking and approaching challenges — the complete society has changed as well. Today, historic sins like pollution and bad working conditions are no longer bearable. Especially highly skilled[27] employees are taking their chances for change. Those companies still unwilling (or unable) to evaluate this mighty opportunity in a positive and constructive way and to decide to introduce this philosophy into the enterprise's structure (as opposed to neglecting the idea of continual change and improvement) will simply loose their *most valuable assets* [r4] over time. So one might say that changes in society do affect any enterprise in more than just one way: The customers' attitude changes as well as employees' attitude does. In addition to individual changes it is inevitable to know that products and services are changing, as well. The way leads from simplicity to complexity, underlining the necessity of being able to manage increasing complexity. Integration must follow diversification for this reason as illustrated in image 1 ("Diversification vs. integration") already. To give just one but familiar example, early computers were able to process information at a few (M)Hz while today's computers are still doing the same but much faster, breaking through the 1 GHz boarder already. The computer programs between user and hardware (=: HW) often allocate hundreds of megabyte, distributed in a multitude of files. It is obvious that SW complexity grew at enormous speed. But often, the development process does not at all or in an ineffective way. Development process needs restructuring, based on flexibility and transparency from now on as already stated before frequently.

Indeed, flexibility and transparency are some of the very first principles attributed to quality. But what is the meaning of this diffuse word "quality", then? Definitions are differing, sometimes contradictory or simply paradox. The original purpose of quality, arising from its Latin radical, is to state the consistence or nature of something in a neutral way. According to Pfeifer [r53] the three common principles of quality are as follows:

| The source of quality: |
|---|
| 1. Quality represents a batch of characteristics of a special product or service |
| 2. Quality is a criterion for customer decision to buy the product or service |
| 3. Quality is devoted to the situations of competition and efficiency to the provider |

Table 35: The source of quality

[26] The four "Asian Tigers" are Malaysia, Singapore, South Corea and Taiwan.
[27] please notice that highest- and high-skilled employees are millionaires [r65] themselves, today — would your company survive their leaving?

The recognition is expressly to mention that quality means much more than just conformity to technical specifications: customer requirements are decisive [r54].

| Another source of quality: |
|---|
| 1. Quality is nothing absolute and a representation of actual requirements.<br>2. Quality is no physical measure and therefore immeasurable. The only thing measurable is the degree of fulfilling requirements.<br>3. Quality is no binary term ('existing' or not) but a scale, ranging from *very bad* to *very good* in analogue sense of interpretation.<br>4. Quality can be expressed as state of assimilation between result and requirement, visualized within image 18 ("Localizing quality") |

Table 36: Another source of quality

The fourth item embeds the possibility to localize quality [r55] and allows to distinguish between three basic scopes of quality observation: quality of a concept, quality of execution and the quality of use.

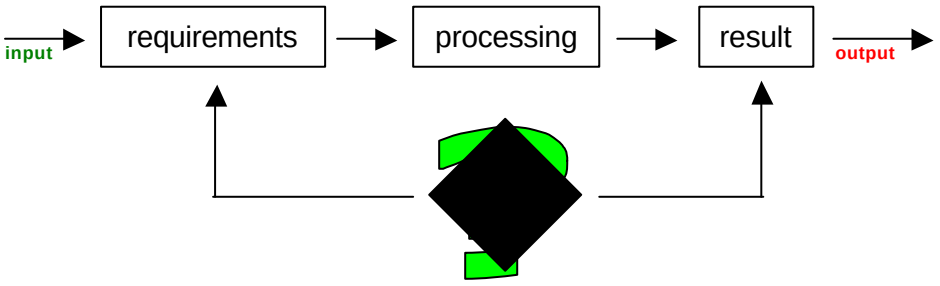



Image 18: Localizing quality

Any product is a result of processes. Based on market observations, the product is designed. This chain of processes is followed by development, procurement, construction and realization. After the product is sold and used, any product's life-cycle ends in its disposal. The importance of the first link in the chain, i.e. the process of planning is plain to see. All the sequent processes base on it. Undertaken omissions or failures which crept in will find their way throughout the product and its complete life-cycle and have a bad impact on it — for certain. To ensure a minimum of those failures[28], companies have the possibility to participate from the broadly available point-of-views, ideas and concerns their employees (could) provide. In summary, one might abuse the nature of definitions and formulate the following paradox:

Quality implies united variety, bottom-up view given.

But the reason for achieving quality being evaluated as difficult is not based on theoretical problems and tenets but on *realizing* them. Various actual frameworks postulate a QMS to solve this crucial problem. This problem is related to the organizational structure, unclear responsibilities and unmanaged procedures and resources. For this reason, the existence of *any* QMS can be evaluated as being state-of-the-art in any kind of business, today.

[28] In addition to arising elimination costs (including removal and process enhancing), legal liability (based on §§ 823 and 831 BGB [r56] for instance) may cause further, unpredictable costs.

The next two sections deal with the topic of QMS more concretely. The purpose is to sensitize the reader for those scopes of an enterprise needing to be involved and participate in such a system. This is the basic approach to establish quality as an over-all guiding company philosophy [r57].

## 4.4. ISO 9000 Series: QMS

Insomuch as ISO framework is one of the most popular frameworks related to the achievement of quality, my first approach seeking for information related to "*quality management systems*" and "*merging*" was quite undefined and pragmatic. But in any case optimistic. And of course, there was lots of information available concerning the first topic — but nothing for the latter.

By leaving the research question of "*merging*" behind now, there is a lot of information concerning QM systems available: ISO framework clearly defines what a QMS *is* and what it is *based* upon. According to ISO 9000 (Figure A.5), the context, in which a QMS needs to be integrated, is reflected by image 19 ("QMS inter-relation"). It presents the dependencies and interrelationship of related terms. This *infrastructure* is basis and *scenery* for the following detail descriptions of QMS concerns:

Prior dealing with this concerns, it is advisable to take a look at identified **8 QM principles**, first. They provide reliable basis for competitiveness in future. Please note that it is conspicuous how the traditional term "*management*" is shifting more and more towards "*self-management*", completed by *transparency* and *continuity*.

| 8 QM principles: |
|---|
| 1. Customer focus |
| 2. Leadership |
| 3. Involvement of people |
| 4. Process approach |
| 5. System approach to management |
| 6. Continual improvement |
| 7. Factual approaching to decision making |
| 8. Mutually benficial supplier relationship |

Table 37: 8 QM basic principles by ISO

From this principles, the following **requirements** result: They are defined in ISO 9001 [r41] and quoted as follows. Please note that there are additional documentation requirements that I decided to leave out of presented elaboration:

| General requirements for a QMS by ISO: |
|---|
| ‣ Identify the process needed for the QMS and their application throughout the organization |
| ‣ Determine the sequence and interaction of these processes |
| ‣ Determine criteria and methods needed to ensure that both the operation and control of these processes are effective |
| ‣ Ensure the availability of resources and information necessary to support the operation and monitoring of these processes |
| ‣ Monitor, measure and analyse these processes, and... |
| ‣ Implement actions necessary to achieve planned results and continual improvement of these processes. |

Table 38: General requirements for a QMS

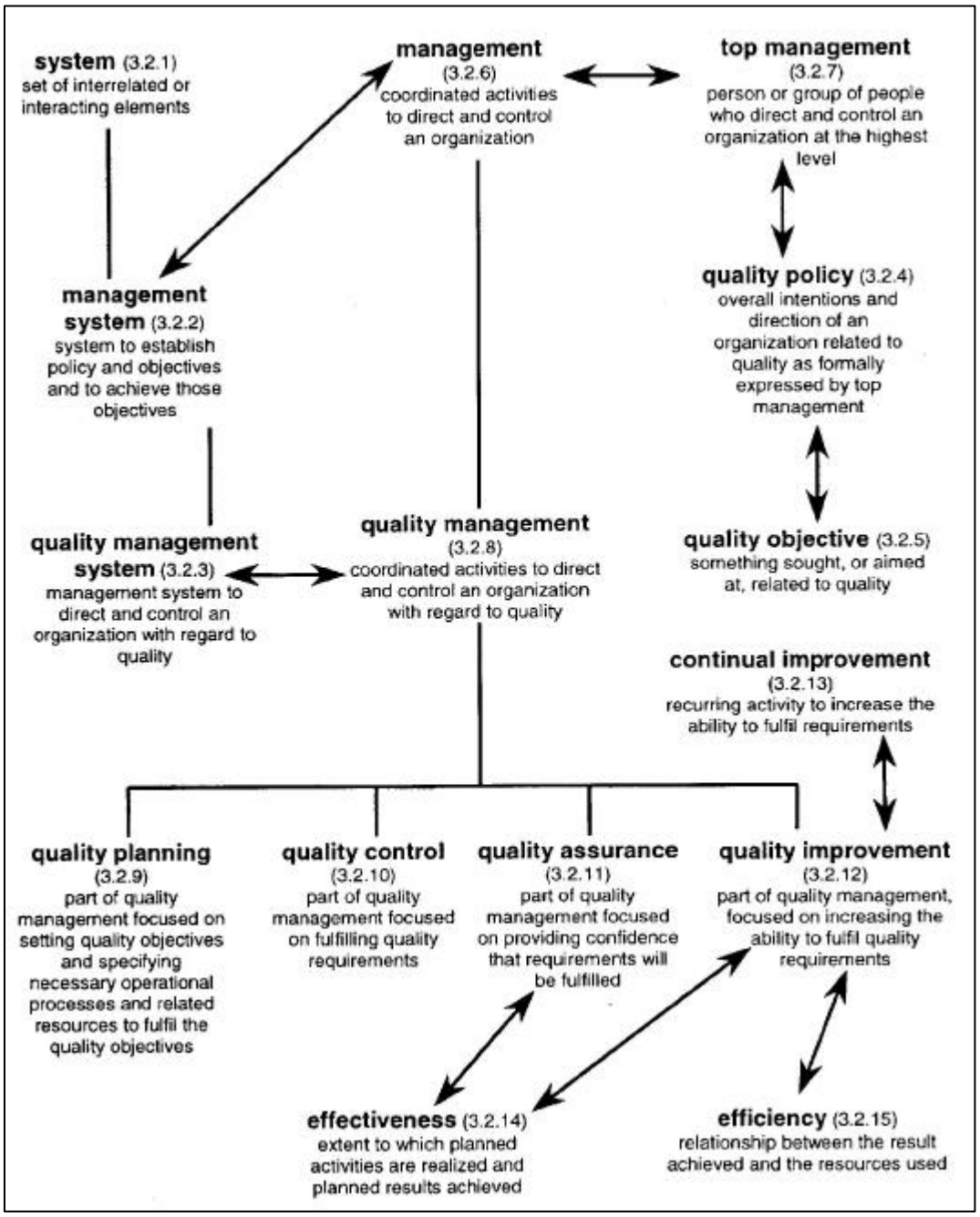



Image 19: QMS inter-relation

Like the figures in parenthesis might already suggest, every related term is exactly defined with the purpose to provide a world-wide and unambiguous understanding about QMS.

To approach this QMS, there are the following basic procedures presented. They will be helpful to present process perspective as over-all point-of-view or method. This can be used to identify entities and dependencies while the primal input is induced by the customer, outside the system.

| Basic procedures for QMS approach: |
|---|
| ‣ Determining the needs and expectations of customers and other interested parties |
| ‣ Establishing the quality policy and quality objectives of the organization |
| ‣ Determining the process and responsibilities necessary to attain the quality objectives |
| ‣ Determining and providing the resources necessary to attain the quality objectrives |
| ‣ Dstablishing methods to measure the effectiveness and efficiency of each process |
| ‣ Applying these measures to determine the effectiveness and efficiency of each process |
| ‣ Determining means of preventing nonconformities and eliminating their causes |
| ‣ Establishing and applying a process for continual improvement of the QMS |

Table 39: 8 basic procedures for QMS approach

A third description is available concerning **quality policy** and **quality objectives**. Although hard to define and measure, both is possible: The objectives need to be consistent with the policy and the commitment to continual improvement. If implemented faithfully, the company may profit from such a definite quality statement.

But even more important is ISOs point-of-view concerning the (high level) **management**. It is, in short, identified to have an exemplary function (in many ways) concerning promotion and establishing of the new directives on the one hand and the duty to control if quality requirements are met as defined on the other. Moreover ISO 9001 presents the responsibilities of management on more than two pages, including activities especially devoted to management like *initiation* of the "new way", aligned with practical requirements (i.e. customer focus, continual improvement, quality objectives, etc), *planning*, clarify *responsibilities and authorities* and *review activities*. On counterpart side and in addition, this framework defines belongings devoted to human resources on a '*technical*' point-of-view.

ISO 9000 even pays attention to the **documentation** as already hinted before. Although in a very common and indefinite way, the value of good documentation is stressed.

An indispensable ingredient of any management system (and especially a QMS) is the aspect of **evaluation**. Every process being evaluated should meet the following questions:

| Evaluating processes: |
|---|
| ‣ Is the process identified and appropriatly defined? |
| ‣ Are responsibilities assigned? |
| ‣ Are the procedures implemented and maintained? |
| ‣ Is the process effective in achieving the required results? |

Table 40: Evaluating processes within QMS

To stress the relevance of evaluation, it is pointed out that this is no annual routine process but an *activity* that needs to be undertaken frequently. The guiding principle, imported from TQM and the japanese kaizen-philosophy, is **continual improvement**. According to ISO, this can be assured by the following basic activities, while the motivating reasons are found in ISO 9001, section 8 ("Measurement, analysis and improvement"). But back to activities recommended for achieving continual improvement, the consolidated activities that ensure this flexibility are presented in following table:

| Continual improvement: |
|---|
| ‣ Analyzing and evaluating the existing situation to identify areas for improvement |
| ‣ Establishing the objectives for improvement |
| ‣ Searching for possible solutions and making decisions |
| ‣ Evaluating these solutions and making a selection |
| ‣ Implementing the selected solution |
| ‣ Measuring, verifying, analysing and evaluating results of the implementation to determine that the objectives have been met |
| ‣ Formalizing changes |

Table 41: Continual improvement of established processes

Assistance is provided by the role of **statistical techniques**. Processes like measuring, describing, analyzing, interpreting and modeling can provide serious input for continual improvement.

But the idea of achieving an *universal definition* has natural limitations, given by the high amount of possible, individual approaches to defined vocabulary and knowledge in general. Every person has its own background of information, and here is my major criticism point: In definition 3.7.1. of ISO 9000 the term "information" is defined as "meaningful data". According to the school of KM [r42], this definition is simply incorrect: If data is desired to "turn into"[29] knowledge, this can never happen without consideration of the *context* the data arose from. To visualize this problem, just imagine that two employees from hotline-service and product development will have different information about their company's products in mind. I declare both information to be *relevant* to each of the employees, and therewith both information are *meaningful*. But these information are far from being the same — and thereful need to be treated *different*. To distinguish them from each other, it is inevitable to take *context* into consideration, too. According to the school of KM, the basic expression describing the transformation of data into knowledge (and vice versa) can be named *knowledge chain* and sounds like this:

Data (+ *context_1*) ⇆ Information (+ *context_2*) ⇆ Knowledge

You may ask for the difference concerning the question of quality and standardization, now, suspecting the importance of my critique. But it is not. *Here*, quality starts — or ends. If the definitions are incorrect, how can the system function correctly? After all, this system is definitely *built upon* these definitions. As a matter of fact, this is a potential and serious source-of-error. Viewing the two types of context, this will instantly become clear:

context_1 = criteria of relevance
context_2 = meaningful patterns of individual experience

Due to the fact that, according to ISO definition, neither context_1 nor context_2 *must enter* a QMS that is based upon the elemental ISO framework, the definition of "information" is identified as being *problematic*, now. Especially when considering the following image [r40], pointing out the diversity of ways on that information enters a QMS and is codify in any kind of *specifications* (which are the basis for quality evaluation in its turn), for instance.

[29] *Turning* data into knowledge is one of the primary activities of KM and cannot be achieved via "accident or osmosis" [r19] nor a kind of diffusing.

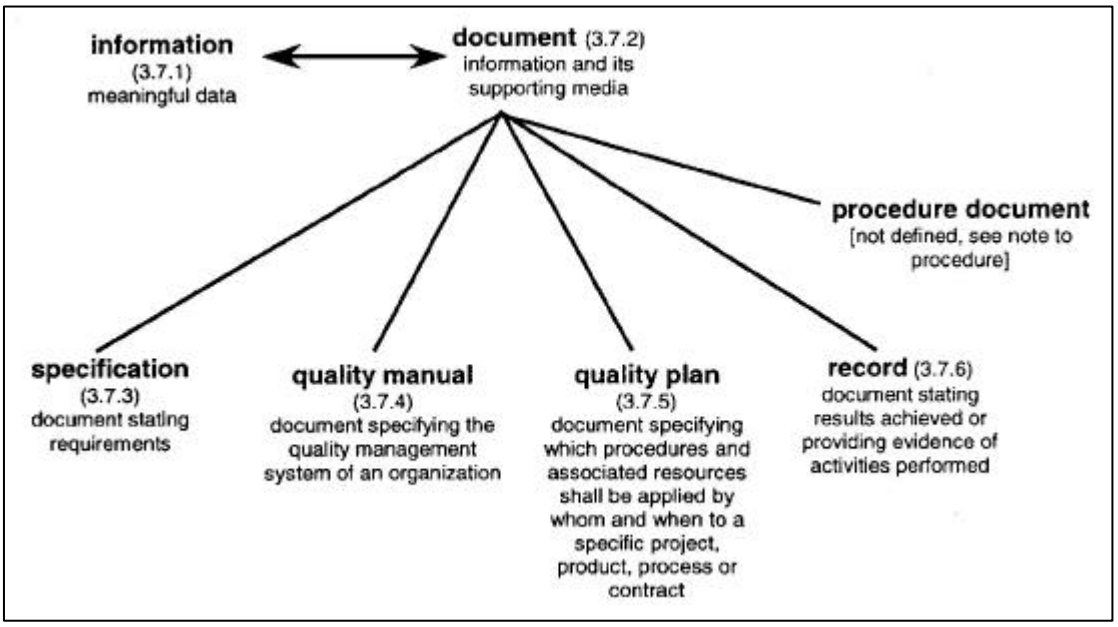


Image 20: Information entering the QMS

Hopefully you can agree on a crucial statement of KM now, that knowledge is worthless without a *broad and explicit access*. My proposal is to invent an appropiate two-step access to knowledge[30] (including *soft* and *hard* definitions) or a kind of *fuzzy-logic* to achieve a *highly overlapping* interpretation of information as a minimum.

Maybe, the undertaking of an *explicit merger* of the objectives and directives from the schools of KM and QA will help to make knowledge extraction more profitable — for individuals as well as for the company as a whole in addition.

### 4.4.1. Excursus: Soft vs. hard

Due to the fact that I frequently distinguished between *soft* and *hard* terms already, I had to include this second excursus to procure a common understanding of this difference and the need of being able to do this distinction.

Beyond doubt, it is crucial to enable oneself to measure what you want to control (or direct) over time. This is the only possibility to ensure a *serious* and *methodical caring* for the entity in question. But the question is now, *what* is to be measured and especially *how?*

According to Walters [r70], then, "Soft Systems is a 'problem solving' methodology. It is often used in the field of Information Systems (=: IS) as a first stage in the analysis of a companies requirements for its IS." Please note that Walters attributes his idea of soft systems to the broad field of IT application and that it is a kind of *first step approach* as already introduced within section 3.2.9. ("Integration needs two steps!"). The importance and its broad significance will arise when trying to merge his Soft Systems Methodology (=: SSM) to the school of KM and its information chain as already presented at the end of preceding section. Walters illustrates his understanding of SSM surrounding as follows:

[30] while the fact [r42] must be considered that the access to *knowledge* takes place via the *unknown*.

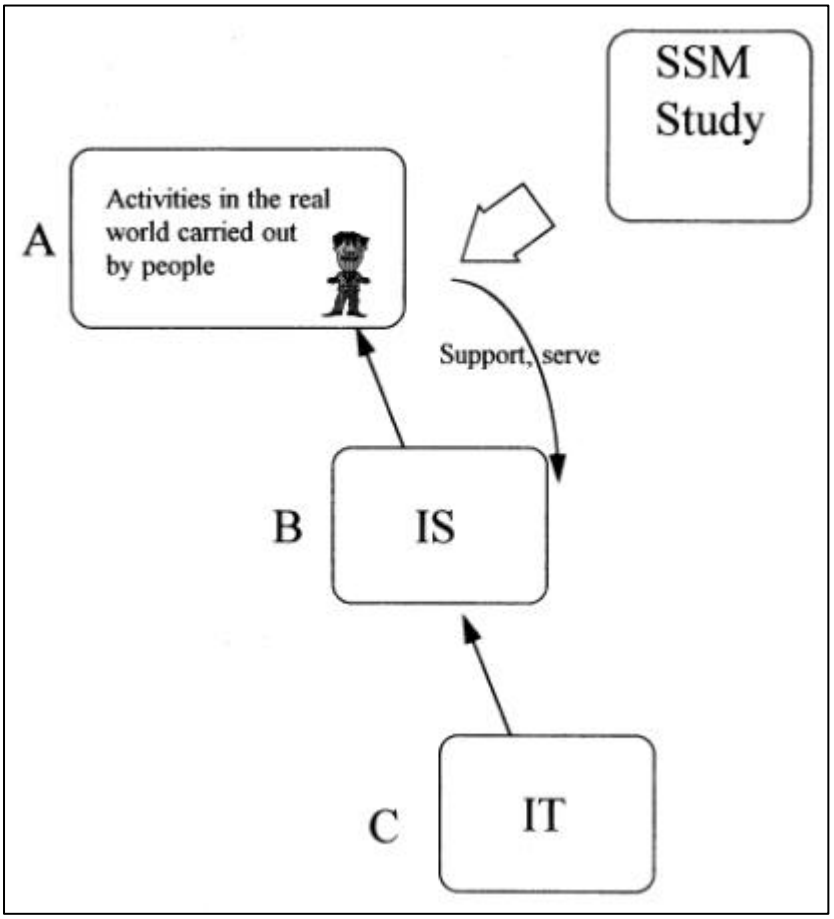



Image 21: Surrounding of soft system methodology

The SSM surrounding includes several types of problems, named A to C. While type A problems are *quite complex*, the nature of type B problems (*soft*) is devoted to social and organizational problems and are of different nature in conclusion.

To give an illustrating example, the problem of moving from one location to another is basically easy to understand. But its realization may become difficult when starting location is "earth" and the location of the destination is "moon". From defining locations of start and destination, complexity evolves. "In fact this problem was no vast that NASA's space research team had to break the problem down into manageable chunks to reduce complexity" [r70]. And so a common methodology needed to be found to enable several problem solvers to work on this problem *jointly* and in a *structured way*. At that time, "theories based on the observed behavior of 'systems' was used for this purpose" [r70]. By following the (successful) systems theory of the backdated Apollo Space program then, the results of this NASA team "were disasterous"[r70]. The reason for this desasterous outcome was investigated and located in one but crucial difference between the actual and the Apollo project: They had no *moon* to aim for and therewith failed to understand the new objective.

This brief example illustrates a common flaw within *every* system (also including hypothetical *perfect* systems[31]): The human interfaces. Due to the fact that humans *do* err and therewith *produce* failures and omissions (i.e. production of *semi-truth*), this flaw is supposed to overcome eternity and therewith cannot be solved and needs to be by-passed for this reason. One methodology to by-pass this problem is to be found within SSM.

[31] "How many IS / IT systems would be perfect *if it wasn't for the users*". [r70]

This methodology is invented in the early 80s and is based on Peter Checkland's "distinction between soft and hard systems"[r70]. The *hard* is represented by technology systems while the *soft* are represented by human activities. And so the purpose of SSM is to provide a "*framework for* collecting and interpretating *information* about the over-all system"[r70]. This can be achieved in case we observe organizations as a system, where people simply perform actions. "These actions need to be interpreted (understood) by the analysts before designing technology which effectively supports the overall system"[r70].

According to the school of KM, then, this framework is nothing but the *context* from which *information* arose. And so the first step of SSM[32] is to extract the *processes* and the (human-) *interfaces* of the problematic situation. This is the basis from which a parallel knowledge escort to business processes can arise.

So by referring to preceding image 21 ("Surrounding of soft system methodology") for a closing view then, the design of B can only be carried out if there is a clear concept of A already. IS work should start from A and not from C while SSM is relevant for being able to understand A.

Moreover, this supports my proposal to reject "unique" terms for definition and prescribing purpose as postulated by various quality frameworks. The interpretation of terms is an indivudual process, attributed to peculiar information backgrounds. So the process of defining entities is proposed to be undertaken using a two step process, too. Unique terms do not exist. To give an idea of differing interpretations of terms, please dial a popular online-dictionary and type in terms you asume to be of common interpretational meaning: type in terms like "shareholder", "scope", "acquisition", "benchmark" or "portfolio". Their underlying context and resulting interpretations are multiple and contradicting more than once. This should terminate the idea of "unique terms" existence.

[32] A standard SSM is SSADM (Structured Systems Analysis and Design Methodology) for instance.

## 4.5. Bundeswehr (German armed forces): QMS

The Bundeswehr (=: BW) is just *one* army out of many at first glance. But at the second it is not. Especially due to the fact that BW is involved in a very special situation, arisen from the merger of (former) Eastern and Western Germany to the re-united Germany in 1990. Soon a new nickname was invented for this united German army: "Armee der Einheit". Indeed, merging both armies was a tremendous business: 495.000 soldiers from western side and about 90.000 soldiers from former NVA army needed to be integrated, followed by uncounted activities like generating actual maps and establishing overlapping networks for (tele-) communication. Moreover, civil dependants and the complete organizational structure needed to be merged, too. Although complicated by traditional prejudices ("*Klassenfeind*") on both sides, the giant merger finally succeeded. The BW became an important corner-pillar[33] in merging both societies and states and was able to participate in Kosovo combat (1999) as united army for the first time. Alike other merging processes, its end has not been reached, yet. 10 years after the merging decision, restructuring activities are still ongoing. BW has recognized that the tremendous but inevitable changes can only be obtained, if management *itself* is going to be integrated, too. Following this aspect of "top-down" integration, the lower areas of management provided vision and example for the employees and soldiers. Unquestioned, this eased the individuals' approach to the merging challenge[34], and established a new culture: Integration now became preferred principle in comparison to exclusion, before. Today, BW has faced and challenged the crucial test of integration and now can serve as model for those armies located in the east of Europe that intend to integrate themselves into North Atlantic Treaty Organization (=: NATO) forces by providing a proved and established philosophy of leadership. The original words from the internet-sites are like follows:

> "Sie [i.e. BW] hat damit eine Bewährungsprobe bestanden und dient vielen Staaten des ehemaligen Warschauer Paktes bei der Reform und beim Umbau ihrer Armeen als Modell für eine wertebezogene, 'gut funktionierende' Führungsphilosophie." [r51]

This became the basis for me to include BW into this elaboration's research concerning mergers under aspects of quality. Unfortunately, related documents are not accessible for the public; but when investigating the material available, I found out that armies have almost the same problems and challenges to meet as civil enterprises. Following the idea of internal and external re-structuring, a lack of collaboration with other political disciplines and means of politic was detected [r45], for instance.

As one out of many "global players" within NATO alliance, BW needs to reduce expenses, which can be seen as a world-wide and actual trend in the world of business, too. Politicians and military heads support this necessity by means of rationalization, standardization and interoperability (=: RSI)[r46]. The two major targets are to enhance the alliances strike force and to use economic means more effectively. The latter should be reached by reduction of traditional intersections in research, development, production, procurement and maintenance. This is achieved by the new NATO strategy, supporting the implementation of international standards into military standards.

Noteworthy to a great extent is the fact that participation to standardization is absolutely voluntary: Every nation decides *for themselves* whether to participate or not, so results from standardization efforts highly differ from another. The German BMVg [r47] underlines the necessity to prefer products according to custom and usage instead of new development, to

[33] For those who are interested, this becomes visible at the *Militärhistorisches Museum* (Dresden).
[34] please recognize that even opposed ideologies had to be "merged": socialistic vs. capitalistic.

prefer international cooperation instead of national solutions and to take Life-Cycle-Costs (=: LCC) as opposed to acquiring costs into consideration. This ends traditional wastefulness, motivated by the historic urge to act as *nations* instead of creating *alliances* and share the existing resources. Apparently, economic shortage re-activates creative and innovative thinking and therewith enables decisions of higher quality.

Without referring to the topics in detail, Böckmann [r46] identifies 5 scopes as opportunities for standardization in civil and operational surrounding as follows:

| Standardization challenges: |
| --- |
| ‣ Material and armament |
| ‣ Operability |
| ‣ Education |
| ‣ Infrastructure |
| ‣ Administration |

Table 42: Standardization scopes in armed forces

This is congruent to the postulation of various frameworks like BPR or BPI, aiming to increase business efficiency. It makes no difference whether the entities in question are processes or national armies: to enable higher efficiency of resource usage, the *intra*- and *inter*-relationships need to be clarified and defined. Inside the army, management must establish connections among the 5 scopes as *inside* the scope and *between* all scopes. Then, both types of interfaces need to be observed and measured to enable continual improvement. Just as in a merging scenario, all areas of business are involved and affected.

In closure, the interfaces are identified as possibility for adding value to effectiveness and efficiency of the alliance and its members, which is seen as a quality aspect by ISO framework, for instance. This quality goal was reached by means of RSI and is based on well-established intra- and inter-relationships. From M&A point-of-view, allied partners prepared themselves to "accomplish together what they could not accomplish separately" [r2] and decreased expenses at the same time. Synergy criteria are fulfilled.

In the following sub-section, the status of NATO QA requirements is presented. SW requirements are investigated and presented dealing with the process of SW development in section 6 more detailed.

### 4.5.1. Outlook: Quality requirements

This document [r48] is dealing with the process of SW development. Of course, it contains the purpose of the document and its scope, introduces related documents and defines used terms. Then the document deals with SW-QMS (=: SQS), SW-QM Program (=: SQP) and SW-Quality Plan (=: SPQP), pointing out the inter-relationships between the components and what they are for. The purpose of the document and especially the three major elements are represented by following table:

| Targets: |
|---|
| ‣ Make the process of SW development transparent |
| ‣ Identify problems in development process as soon as possible |
| ‣ Provide quality related data for most efficient correction |
| ‣ Ensure quality impact all over the development process |
| ‣ Verify whether developed SW fits the requirements |

Table 43: Targets for SW development

The different aspects of quality are structured as represented by following image, extracted from the quoted document. Please realize that SQS, SQP and SPQP are presented more detailed in the following three sub-sections.

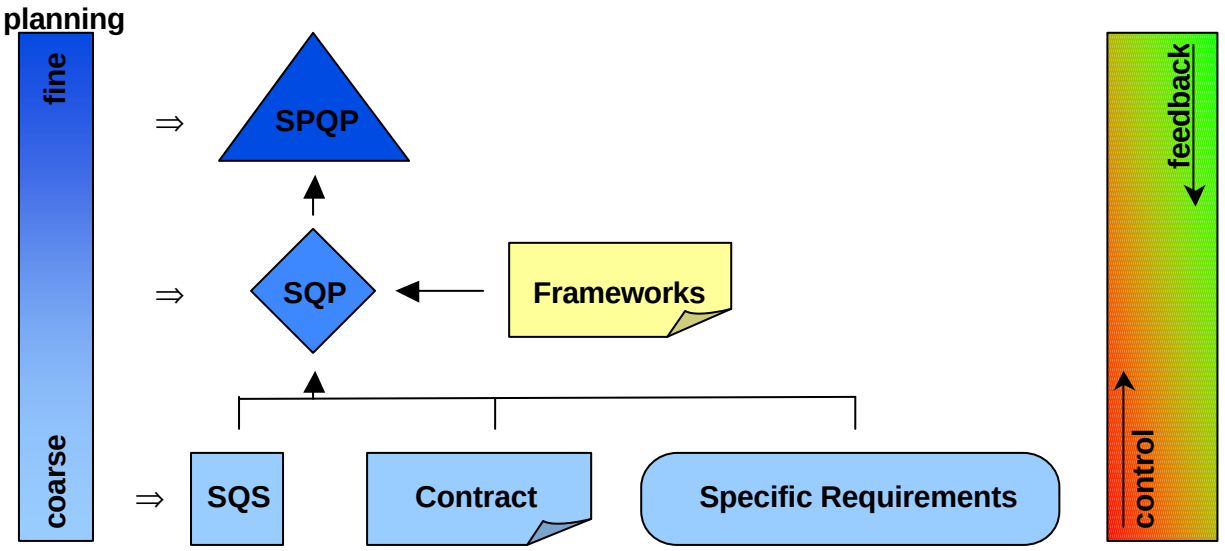



Image 22: Surrounding of the SW development process

While the target of the document is summarized by the 5 items of already presented table, the three major counterparts of the general quality requirements are presented as follows:

#### 4.5.1.1. SW-QMS

A SW-QMS (or SQS in NATO abbreviation) is required to meet the following dependencies and conditions, presented as image and textual completions, here:

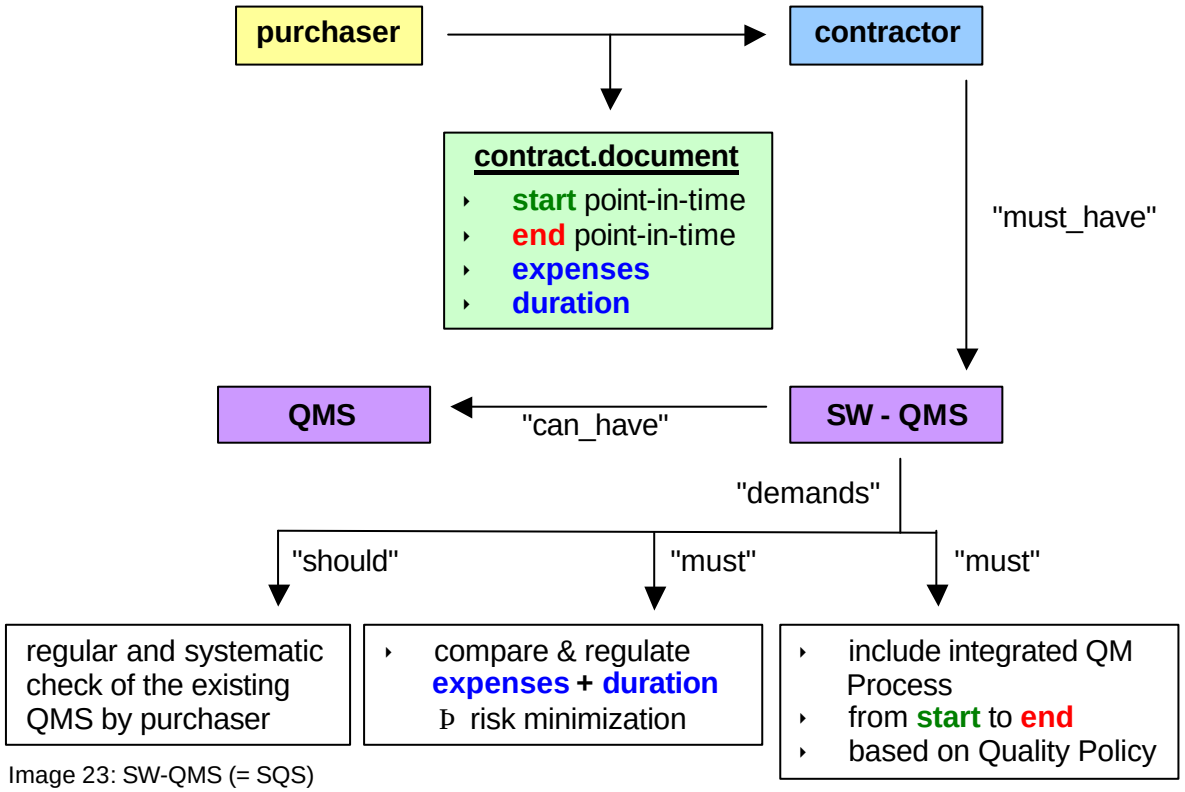



Image 23: SW-QMS (= SQS)

This image presents one of the three major elements guiding the NATO SW development process. It is designed to enable a first and broad standardized approach. While the graphic presents the components and their (general way of) inter-connections, the following table focuses on the actions being undertaken. This table supplements the preceding graphic. From realization point-of-view, a SW-QMS could be a SW system as well as a simple handbook and must include technical processes from SW development as well as management processes. The following actions are presented in detail:

| SW-QM: technical and management processes |
|---|
| ‣ Responsibilities, authorization and conditions need to be clarified |
| ‣ Procedures for planning, monitoring, securing and improving the system need to be mentioned |
| ‣ Procedures for estimation of expenses and duration need to be mentioned, paying attention to reach quality as pragmatically as possible |
| ‣ Procedures for monitoring expenses and duration all over the development life-cycle to improve the process of estimation continuously |
| ‣ Procedures to assure that possible differences are detected as soon as possible |
| ‣ SW-QMS must enable various developments over a long period of time |
| ‣ Special cases need special tools and documentation |
| ‣ Processes or tools can be chosen individually, if circumstances and conditions are defined |
| ‣ Purchaser and top-management check the system periodically and systematically to document the status und sufficiency of the system's elements |

Table 44: SW-QM processes

#### 4.5.1.2. SW-QM program

With the aim to assure transparency and controllability, the contractor needs to plan and establish a SW-QM Program, SQP in NATO abbreviation. In comparison to preceding SW-QMS, the demands of the latter are generally the same, but more detailed. While the contract, SW-QMS (with all its rules and procedures) and the requirements serve as a kind of common basis for the *first approach* to standardized SW development process, the SW-QM Program includes all the basic processes depending to the activities, realizing the *specific* project. The SQP is attributed to the process of SW-QM.

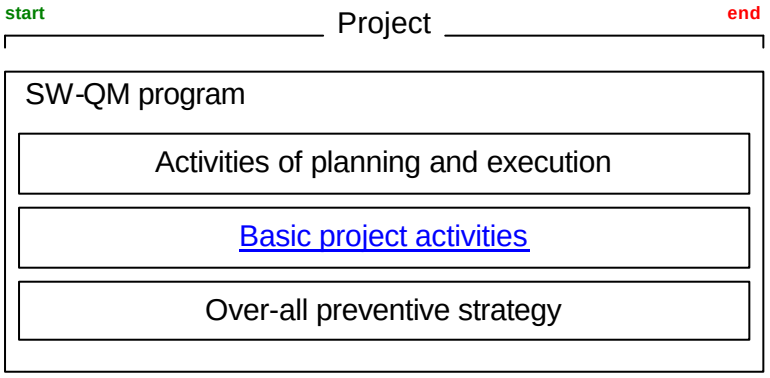



Image 24: SW-QM Program (= SQP)

Please recognize that the presented facts are summarized, making omission und incompletion inevitable in result. To give *an idea* about the suppressions, the unmentioned main topics are SW requirements, management impact, SW engineering and evaluation & verification. Besides, the SW-QM program should contain and consist of the following activities:

| SW-QM program: basic project activities |
|---|
| ‣ Definition / identification, top-down approach and assignment of requirements to SW products. |
| ‣ Definition and application of management and technical processes to enable development under the aspects of quality. |
| ‣ Definition and application of measurement to verify SW quality and evaluate existing processes and actions. |
| ‣ Strategy should prevent deficient processes and insufficient monitoring in particular. |
| ‣ Plan specific QM activities like selection, development and application of standards and procedures under aspects of particular circumstances (contract, ...) |
| ‣ Recommended precondition for contractor prior SQP development is to inspect the contract *formally*. The aim is to verify whether postulations, technical and management processes are defined precise enough or not. |
| ‣ SW-QM Program must base on existing norms and frameworks as far as possible; abnormalities need special documentation |
| ‣ Executive activities are mentioned in SPQP (i.e. SW-Quality Plan) |

Table 45: SW-QM program (= SQP)

#### 4.5.1.3. SW quality plan

The contractor is prescribed to document the complete SQP within a SW quality plan (in NATO abbreviation: SPQP). Moreover, the contractor is obliged to monitor actuality of the plan and actualize it in case meaningful abnormalities are detected. If this directive is followed consistently, the plan becomes effective tool to monitor and control the quality of the complete project. The following table will enable a complete overview about the plan's component parts.

| A SPQP must include: |
|---|
| 0. General information:<br>Project name, version, date of publication, purchaser & contractor and permission of those who are responsible to fulfill a certain task |
| 1. Introduction:<br>1.1. Purpose and application of this document as well as various overviews<br>1.2. Requirements and borders for plan application<br>1.3. Continual adjustment of this plan: people, frequency and way of modification<br>1.4. Related documents (entirely)<br>1.5. Inter-relationships to other plans<br>1.6. Terms and abbreviations |
| 2. Description of the project<br>2.1. Project overview: main activities, milestones, means, ...<br>2.2. Assumptions: programming language, OS, HW requirements, involved SW<br>2.3. Products to deliver: SW, documentation, service |
| 3. Management<br>3.1. SW development: phases, goal orientation, methods, criteria, resources, risks<br>3.2. Organization: any kind of external directive and its impact(s)<br>3.3. Well-founded means of correction: cause and effect, efficiency and responsibility<br>3.4. Directives related to sub-order(s)<br>3.5. Configuration management<br>3.6. Directives related to off-the-shelf SW<br>3.7. Directives for filing and storage: records<br>3.8. Directives for filing and storage: data media |
| 4. SW engineering<br>4.1. Development environment<br>4.2. Methods, procedures and norms<br>4.3. Development documentation |
| 5. Evaluation and verification:<br>All kind of related methods, activities, responsibilities, tools, etc need to be documented |

Table 46: Components of the SPQP

The SPQP makes clear that NATO chose the way to define and communicate the complete project. The way this goal is achieved is following the idea of "two step": coarse definition of the project in SQP, fine definition in SPQP, based on the foundation of SQS. The last serves as kind of directive (or philosophy) while the other are pragmatic means to "solve the problem". It is crucial to realize the high importance NATO assigns to inter-relationships and responsibilities anywhere information is handed over any kind of interface.

## 4.6. Software Productivity Consortium

While preceding section provided partially new input to this elaboration concerning the research question for "*quality management systems*", it did not provide further knowledge concerning the research question for "*merging*". There will be the same situation in this chapter but fortunately vice-versa: The Software Productivity Consortium (=: SPC) concretely dealt [r23] with the subject of *how-to* integrate two (or more) entities and these are my extractions:

SPC describes a "process to integrate organizational processes" after a corporate merger or acquisition. The recommendation is to start integration process as soon as possible because the volatile situation of the company can be used to stabilize *all* processes of the company for a better and easier future with respect to "technical, managerial, and cultural issues". The process is based upon SPC's Evolutionary Spiral Process (=: ESP) and has proven robust and usable in a variety of situations. Moreover, it is designed to use and build upon other SPC products like, for instance, the Quagmap-Tool as already presented in preceding section 3.2.12.1. ("Quagmap").

For me, it is inevitable to point out expressively, that this is the only investigated document dealing with the scope of process being merged within an acquisition. And as a matter of course, it is highly based upon Lajoux [r2] on the one hand and SPC directives on the other hand. The latter are in detail the "*Evolutionary Spiral Process Model Guidebook*" and the course "*A Systematic Approach to Process Engineering*".

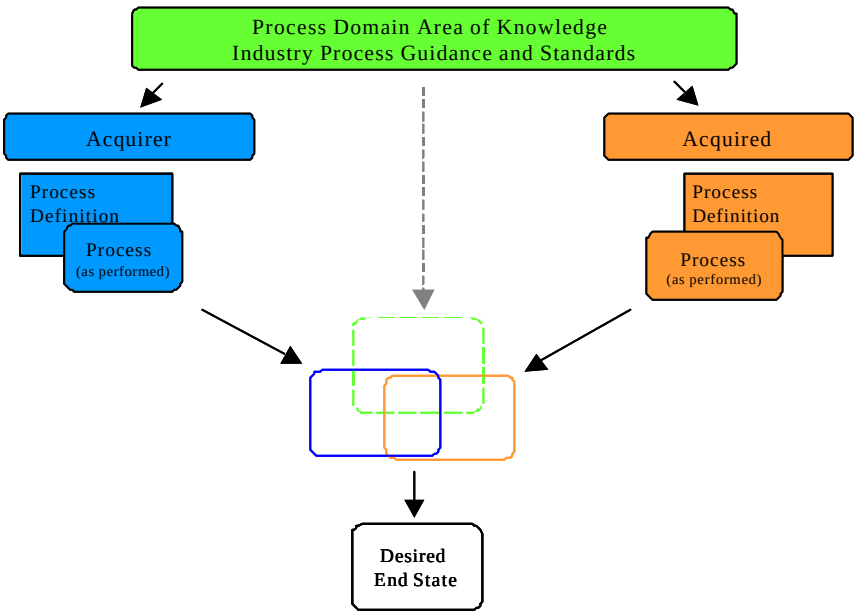



Image 25: Common components of merging processes

As illustrated above, there are three *over-all* or *common* inputs into the process merging process. These important inputs are introduced in the next three sub-sections.

| Every process merger process has three basic inputs: |
|---|
| ‣ A process domain area of knowledge |
| ‣ The two companies' processes |
| ‣ The desired characteristics for the organizational standard process |

Table 47: Three basic inputs

### 4.6.1. Process domain area of knowledge

*"Effective business processes are based on an organizational history in which processes that did not work were replaced by better ones, thus making the business more successful."* [r23]

This is the over-all advice by SPC concerning the knowledge of processes. Although presented simply and unspectacularly, this statement provides the essential knowledge about the nature of processes. Every process is no end in itself but a means to an end. If employees dealing with them (and they truly are the only ones) are encouraged to modify those processes that were identified as hindering, incomplete or in need of improvement from *any* point-of-view, the bad processes would be replaced by better ones. This is a good occasion to remember the possibility of integrating a maturity measurement figure into invented rules and traditional knowledge.

By realizing preceding proposal, an *automated* evolutionary improvement of *any* process can be expected, especially from the *long-term* point-of-view.

### 4.6.2. The two companies' processes

Prior acquisition, each company has its own way of doing its business. They may have standards and frameworks implemented, but of course need none. Anyhow, these processes (existing or not) and their definitions will serve as cornerstone of the new, merged company and especially all of its processes.

It is recommendable for SEPG to evaluate these two sets of processes against industry process guidance and standards that are desired to be part of the company's future. The requirements of future processes need to be identified and, according to SPC, "addressed in the process merging plan".

### 4.6.3. Desired characteristics for the Organizational Standard Process

Preparing to merge processes, the following illustration will provide a broad view over several scenarios possible, represented by figures 1 to 5, here. Please realize that the focus of this elaboration is represented by figure 4, while scenarios 1 to 3 and 5 are ignored.

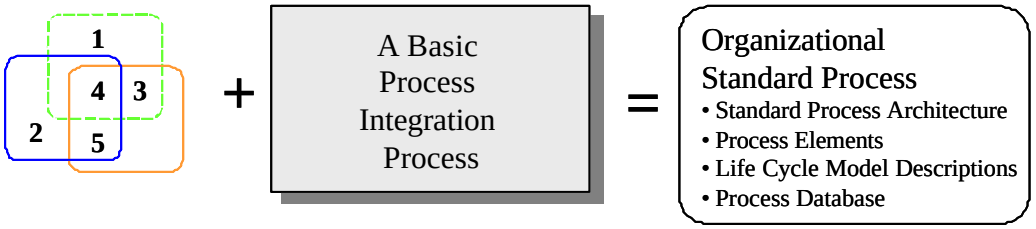



Image 26: Organizational Standard Process

As presented in subsequent image 26 ("From OSP to project process"), the OSP consists of four basic components (see left side of succeeding table 48), stating the interrelationship of these four components to future project processes.

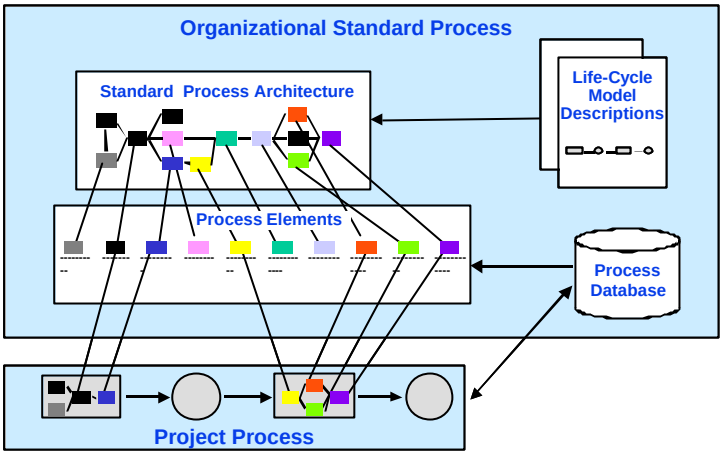



Image 27: From OSP to project process

While the Standard Process Architecture (=: SPA) is influenced by the Life Cycle Model Descriptions (=: LCMD), the Process Elements available result from a Process Database containing all Processes available. In a second step of cognition, SPA (*"how"*) and LCMD (*"what"*) together provide the basis for processes created in future.

Benefits of a desirable OSP are arising from the fact that its elements are *common* across the whole enterprise. It provides —at a very high level— the architecture of a complete development process as well as an overview about the basic components of processes. This transparent OSP will ensure continual improvement in case this attempt is seriously undertaken. In concrete, the benefits can be represented by following table:

| Common | Benefits from the OSP | Concrete |
|---|---|---|
| ‣ common and documented process architecture<br>‣ common (basic) elements<br>‣ life-cycle descriptions<br>‣ process database<br>⇒ broadly applicable | | ‣ a basis to create transparency to improve quality aspects, introduce KM, ...<br>‣ processes are consistent and more robust<br>‣ continual improvement becomes measurable (maturity of processes)<br>‣ clarifying of work sequences and responsibilities<br>‣ simplification of process and their launches |

Table 48: Benefits from the OSP

This is the basis for an integration process to produce an OSP as additional output as already postulated in chapter 3 ("Integration"), while the integration process has been observed within section 3.2.5.1. ("Integrating processes").

# 5. Analysis:

"Die Zukunft liegt in der Integration
von Führungs- und Steuerungsgrössen
in den Controllingkreislauf" (J. Brunner, Arthur Andersen)

## 5.1. General extracts

Integrating entities by two major sub-processes concurrently and inter-connected (i.e. merging humans and processes) is basically easy to understand, hardly imaginable and even harder to get *done*. Unfortunately the presented integration constraints make this goal so hard to achieve in practice. So in general, the problematic nature of the integration processes does not depend on *theoretical* contrariness, inaccuracies or omissions but the problematic *practice*. *Doing* the merger, *performing* it is apparently the hardest problem, waiting to be solved. But due to the fact that every merger is of highly individual (and partially unforeseeable) character, this performance problem needs to be solved *by yourself*. You can study and read multiple guidelines and recommendations, but they will be as unable to predict the unpredictable as you are yourself. Of course: they provide hope and experience you can use to shape your merger ideas. But this is -still- without any effect concerning the *doing*.

> "Because this process merging is occurring at a time of considerable organizational instability, expect false steps and expect people to focus on their own survival rather than on the process merging project. Process merging requires investing overhead money, which tends to run counter to the belt-tightening that is often enforced after a merger so that the acquirer can pay for the acquisition. This may result in unstable resources." [r23]

This draws new attention to the *way* these merging activities are recommended to be undertaken. Fortunately, this is very easy to describe. An attitude of fairness and balance, combined with easiness and attentive observing have the power to enable the postulated integration of existing diversification. Presented *four qualities* can be summed up within the invitation to *'share*", which is the basis for any data-, information-, and knowledge inter-change of two (or more) entities. This *sharing* enables to learn a *spanning* way (as opposed to a *piercing* way) of thinking and is unquestionably one of the future challenges you can decide to meet. Or not. But it is not a good recommendation to avoid this decision in either case.

> "Variations exist in *how certain* activities were handled: some groups investigated risks only informally, for example (and some did not investigate risks beforehand, but wished they had!). Process data may have been collected electronically from an intranet, or on paper, or via interviews or group discussion. A process architecture may have been explicitly designed or it may have evolved from a list of existing processes, or even from a grouping of processes in the attempt to meet SW-CMM or ISO 9001 requirements." [r23]

So: Don't panic. As sure as complexity *will* evolve post-acquisition and all over the integration sub-processes, it is also sure that complexity can clear the way to achieve the integration of detected diversification. Especially if the involved people act under common aspects of quality and the principle of teamwork.

Anyway, the over-all goal of integration should include more than merging the entities. If merging operators only concentrate on this job, the challenges for synergy achieving will elapse unexploited. So the integration goal should be enhanced by value-adding aspects as already inspired many times. They can result from transparent communication structures (including sub- and super-structures) over establishing KM (to enhance the knowledge accessible and available) up to concrete inter- and intra-faces investigation (with the ulterior motive to detect and exploit synergies).

## 5.2. Categories of findings

Although it is practically impossible, I try to attribute some major extracts to certain categories. This is *partially* impossible due to the fact that the inter-relationship of the categories is extremely high. To illustrate a concrete example, please compare the categories "Communication" to "Culture" and to "Communication culture". Nevertheless, the attempt to structure presented knowledge in topics of practical approach is undertaken as follows:

| Category | Findings |
|---|---|
| Merging operators and IMT | They have formal authority over the people whose work they coordinate, so they must have and use considerable interpersonal and team-building skills to achieve their goals. In addition, these people serves as example to employees and managers and therewith have to decide whether to serve a *bad* or *good* example. In case the latter is intended, they must be aware to pay multiple attention and assistance and to frequently involve others, for instance by periodic reviews.<br>They (may) determine the future communication culture of the merged enterprise.<br>In addition, stay as neutral as possible. Always be aware that both companies have assets of knowledge that are worth preserving. |
| Communication | Needs to find entrance into a company-wide and softly codified communication culture. This culture should be build upon the principles of KM and QA, allowing to accept knowledge as resource (as opposed to truth).<br>Nevertheless, such a culture is, of course, long-term orientated and its additional purpose is to establish and built up trust among employees and management. Building up such a system after acquisition announcement, this will help to re-establish trust.<br>For this reasons, the principles of such a culture must include confidence and easiness. This will help to keep the communication culture transparent and motivating. Management is encouraged to teach by example. |
| Employees vs. management | Concerns need to be addressed. Soon and honest. No way out. It is recommendable to present typical questions before emerging ("FAQ"). In case concerns arise during integration, investigate this concerns and consider to alter the cause for concerns. Inform previously concerned people about your investigation and your modification.<br>Employees should not be sparing with feedback before, during and "after" the integration. This is the essential information management depends upon to make the integration successful. |
| Training | Training employees is no annoying expenditure but an opportunity for management to undertake, re-establishing and demonstrating trust again. Employees soon understand that these "expenses" are spent to secure their jobs as well as enterprises' future.<br>Moreover training is one of the easiest and cheapest ways to exchange |

knowledge between both sides of the merged entities in question. Mergers can become a source for profitable growth in case everybody is trained — from maintenance to top-management

Add value to your company

Pass behind the idea that value-adding activities must lead to instantly measurable value. Prefer to establish a decision-making culture, where experience is exchange across disciplines in teamwork, instead. The value-adding benefit may remain undetected, at first, but your enterprise is expected to benefit in the long-term and as a whole from such definite change. Do rely on financial and economic measures *less*. According to Arthur Andersen this is even more important, "[...] als die Wertschöpfung und damit der strategische Erfolg des Unternehmens in den Geschäftsprozessen begründet liegt, deren Steuerung nicht ausschliesslich mit finanziellen Messgrössen erfolgen kann." [r44].
Then, go to identify inter- and intra-faces of every kind throughout your enterprise and keep in mind, that they are a basis for quality assurance as well as they are for achieving synergy. Here, process experts can create the basis for effective and efficient processes as arising from a "process map", which is a result from previous stock-taking activities itself.

Add value to merging activities

"Try to focus process descriptions on the things that add the most value. Interfaces among people and groups can usually be defined better, and people accept interface definition better than direction regarding how to do their own work. Try to specify what people should do and how the quality will be measured rather than how people should do the work, whenever it is possible to allow such latitude." [r23]
And: Establish "the SEPG as a *resource*(*) to be used by the projects. When implementing the new processes on projects, visit the projects regularly and offer guidance, review, facilitation or other assistance as required. Consider holding a “process review board” to track the implementation progress across projects. Staff this review board with people from all the projects so that lessons are transmitted across the implementing groups." [r23]
(*) Please understand that this quote is absolutely consistent with my preceding advice to treat knowledge as resource *in general*.

Fight the fighting ones

Saboteurs and resisters, management quarrels and culture wars can endanger over-all integration. Merging operators are encouraged to document what they have seen and bring it to the attention of "those managers who care" [r23]. If communication is done consequently transparent right from the beginning of merger announcement, it should of course be colored positively, pointing out the reasons for this strategic decision and the future challenges and how company and employees *together* try to reach their goals. But open and transparent communication provides the possibility for management and employees to state and fix imaginable, expected and inevitable consequences on counterpart side, too.
Do not allow employees to complain that "foreign" processes or process models cannot apply. Insist on their reading and make sure they truly understand them. Guide this process.

| | |
|---|---|
| Involve the legal department | "Because acquisitions must follow acquisition law, many steps must be taken that cannot be accurately anticipated by engineers or other technical people. Each heritage company is a legal entity with intellectual property, copyrights, trademarks, and trade secrets." [r23] |
| Culture | "Culture is critical. Every interviewee mentioned cultural differences as a roadblock to success in the acquisition(s) he or she experienced. The only way to deal with this roadblock is to understand it." [r23]<br>This statement encourages to investigate (both) existing cultures and to codify them within the new communication culture. In case the statement that "processes that did not work were replaced by better ones" [r23] is extended across the board of *processes* to include *culture* in addition, a common culture will arise over-time. Organically.<br>As postulated by Arthur Anderson frequently, that traditional comprehension of "culture" is no longer sufficient: The enterprise (including its produced output) needs institutionalized platforms where people (across all boards) analyze commonly what they find and create a broader, individual knowledge in return. The arising benefits from such a behavior are of multiple nature. |
| Measurement | Assuming that measurement is essential means for control and assuming in addition that a company consists of various individuals (that choose individually), a reliable measurement is hardly achievable and even harder to work in a reliable way over times.<br>In consequence, measurement needs to shift from *detail focus* to *broad scope* measurement. Prefer to measure in a **soft way & on broad scope** [r44] as opposed to measuring hardly on a detail scope. The latter implies the problem of getting lost in arising infinity.<br>Moreover, it is recommendable to distinct data from information from knowledge. |
| Communication culture | Knowledge is not to be evaluated as *true or false* — its a resource for your business. If any kind of knowledge turns out to be "false", then, simply prescribe this detection and add it to that already existing. Add a **maturity figure** (counting access, for instance) and let time find out, which of both knowledges[35] turned out to be *more* profitable for the company. Generally reject "X-OR"-thinking (exclusive) for the sake of achieving "OR" and "AND"-thinking (inclusive). Always be aware that a contradicting opinion might be the correct one.<br>Reward people — but never punish them if it can be avoided.<br>Learn to suspect the almighty experts [d3] that "seem to have all the answers"[r23]. Always question what you are told and sometimes it is good to do this below surface, first. |
| Continuity & stability | For merging operators it is vital to report to the same person(s) and to ensure they truly care for the merging effort.<br>Those employees remaining within the new company need (and deserve!) special care and embracement by management or at least the feeling of it.<br>It is unquestionable, that "the safer people feel, the faster they will regain |

[35] Unfortunately there is no plural-version of "knowledge" and so I had to 'invent' it here.

| | |
|---|---|
| | the productivity they lose in times of uncertainty" [r23].<br>Besides — *everything* established or prescribed needs continual verification to achieve stability [r44]. |
| Strategy | To remain competitive, the company's strategy needs continual inspection to achieve continual success [r44] (in case the strategy was previously undefined, this is especially true). This goal could be achieved when *success* is *measured* by *criteria* of *customer- and quality-orientation*. *Continuously*, with the *distinct statement* to aim at mid- to *long-term success*. Identify, use and prescribe *standardized* approaches and processes. The strategy is any enterprises' cornerstone.<br>Less than 50% of German companies has a defined strategy [r44]. |
| Control | Control consists of a circle (as a minimum): top-down direction from management to employees for requests and guidance, while the reverse direction is for providing feedback from the employees directly to management. This ways of communication could and should be infra-structured for the purpose of standardized information interchange. |
| Knowledge | Find a way out of the traditional knowledge trap. In case knowledge is filed and stored "somewhere" within your company, this is to be evaluated as a dead resource, simply wasting money. Decide to erect a knowledge pool on the one hand or decide to burn this old papers and go over to spontaneous management on the other. But do not sneak away from deciding! |
| Quality | Investment into quality is the best imaginable investment into future. Its only weakness is that benefits from such an investment can be expected in the mid-term, the soonest.<br>(The aspects of quality are specifically dealt within the next two chapters) |
| Time & money | "All acquisitions cost the acquirer money" [r23] and as a rule of the thumb it's more than you expected.<br>At last, this is not new to business people: Every capital expenditure related to stabilization and improvement of the company is seen as an investment in the future. All future investments are difficult to evaluate *in advance*. This is the reason for *approximations* instead of *calculations* in this kind of business. According to my personal opinion, it is always recommendable to expect *higher* expenditures than vice-versa. Future investment amortizes in the long-term point-of-view, only. |

Trying to sum up all this categories with their knowledge, I would like to do so by using the single word "share!". This brilliant idea did —unfortunately— not arise from my personal thoughts but from a merging expert. In her book [r2] Lajoux even presents this little word as integration *tool* and attributes key-features to it additionally. She recommends to interpret and understand this word as invitation to share *space*, *goals*, *standards* and *services*.

This sharing should be organized and thus standardized. This satisfies various quality postulations for a transparent communication basis as extracted from chapter 4, and thus introduces a new communication culture to the organization. This is true for the post-merger organization as well as for any kind of re-structured organization in addition.

Finally it is plain to see that the result of integration can be evaluated as "presumably of higher success" if the integration (with all its complexity-creating sub-processes for each single merger activities) is done under common aspects of quality than if it is not.

## 5.3. Measurement

*"It's a competitive world:*
*Everything counts in large amounts"*

*Depeche Mode, Everything Counts (1983)*

The introducing quote gets a peculiar meaning if it is combined with the following one: "Es ist angesichts der vielfältigen Faktoren, die auf den Gang eines Unternehmens, einer Branche oder einer ganzen Volkswirtschaft Einfluß nehmen, nicht möglich, erreichte Zustände, Effekte und Wirtschaftsziffern auf die Wirkung eines einzigen Faktors, z.B. eines bestimmten FuE-Programms, zurückführen. Trotzdem lassen sich einige Anmerkungen machen..." [r38]. This peculiar meaning refers to the darling and stepchild side of the term *measurement*. Quality experts and engineers tend to agree on the darling side easily because they know that ensuring a certain quality (or nature) needs continual monitoring and measuring samples. These samples are *inevitable basis* for evaluation and corrective decisions if needed. Nevertheless, the attempt to map and measure a complete company is always a process devoted to the **knowledge chain** and thereby causes the loss of data, information and knowledge at every interface when consolidating. This is unproblematic if the samples taken aim to represent *soft and broad knowledge* instead of hard and deep knowledge. Especially within integration, the first kind of measurement can help to prevent from getting "caught up in the day-to-day affairs of the unit, which makes it hard to focus on the more *global issues*" [r11].

## 5.4. Intermediate summary (I)

As sure as complexity *will* evolve post-acquisition and all over the integration sub-processes, it is also sure that complexity can clear the way to achieve the integration of detected diversification. In case it is your job to achieve this goal, it is vital to perform a spanning stock-taking prior starting *any* merging activities at all. This stock-taking activity refers to the elements of integration and the peculiar integration constraints as presented in chapter 3. The next step for the integration magaer triangle (=: IMT) is to establish a transparent and bi-directional communication highway, where everybody involved must be enabled and encouraged to participate in. At the same time, merging operators must be enthroned: In person and in reliability, they need explicit acceptance and support from either management(s')- as well as from employee(s') side. This is an essential basis for IMT to hand over responsibilities to merging operators, who are set in to guide and monitor the merger processes on a more detailed level of approach. While employees are recommended to process the merging activities themselves, the merging operator's job is to guarantee that the outcome of this merging activities *fits* the requirements and *fits* to the existing (organizational) structure as well. Now it is time for IMT and merging operators to meet frequently with the purpose to align their knowledge. This will merge the inter-connection between employees and merging operators on the one hand with the inter-connection between management and IMT in a second step.

It is essential that the *structure* described bases upon the preceding *four qualities* (remind section 5.1., "General extracts") to enable success of the merging activities and, in bottom-up-view, the entire integration.

Please note that my proposed *structure* directly arose from section 3.1. ("Elements of integration") in combination with section 3.2.5. ("Tasks & processes"). Moreover, it is consistent with SPC recommendations for the process of merging processes as consolidated and illustrated in image 10 ("The ESP") in addition.

So it is time to overcome the fear that might arise from erring decisions! In case there is something to be identified as "decided wrongly", just create a process that helps to avoid *similar* errors in future. If the company can profit (learning is profitable!) from undertaken errors, the erred decision can be evaluated as expensive but meaningful investment into knowledge. This learning effect obviously puts the occurring loss into perspective. So in conclusion, a company can also ask for a learning effect instead of asking for punishment ("who is guilty?", "who has caused this error?"), traditionally.

As concluding statement to end the chapter of the first intermediate summary I would like to present the following image:

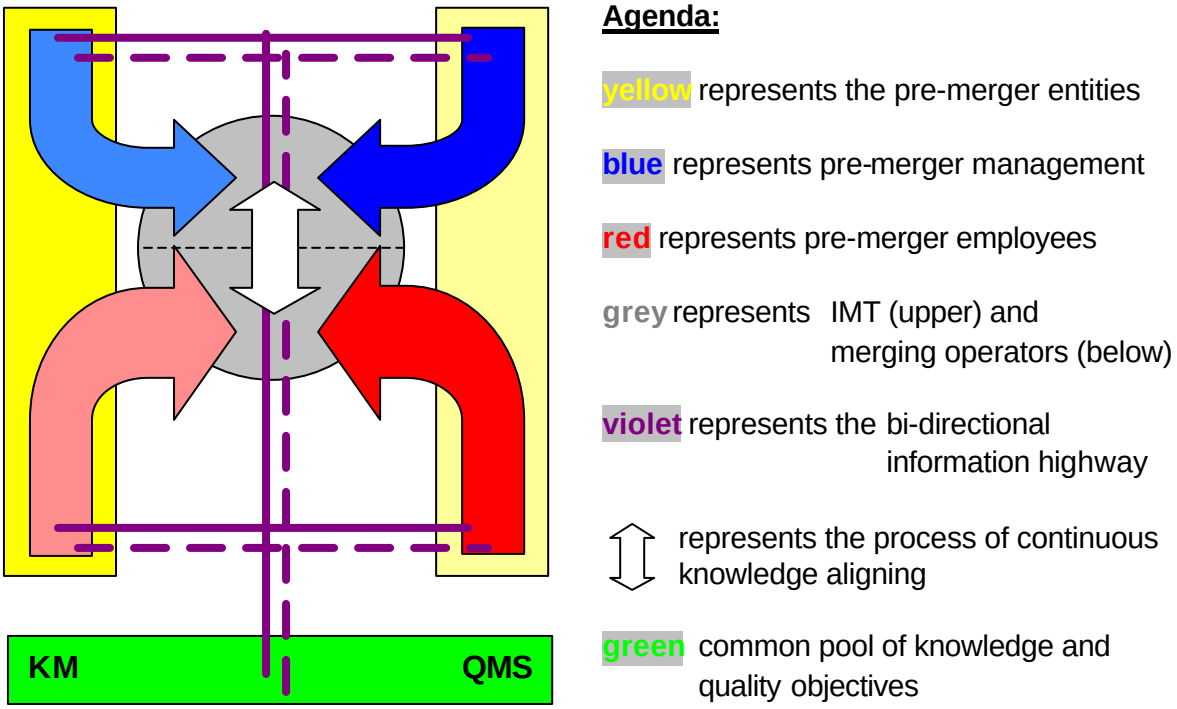



Image 28: Integration information structure

A structure like this (automatically) evolves in case integration is performed as a serious attempt to achieve a united base from which the post-merger companies try to "accomplish together what they could not accomplish separately" [r2]. Such a structure demonstrates an intended balance of and between former independent companies (or BUs) and affects people's fear in a calming way in addition.

In case such information highways are established during the integration, they could become infrastructure to erect a united knowledge- and quality base.

# 6. Software requirements

When dealing with requirements attributed to the process of SW development, it is advisable to understand the need for having any: Trying to sum up the reason in a brief statement, it can be stated that explicitly defined requirements are inevitable to ensure an *effective* and *efficient* development process with the desired (and nothing else!) product as process output. In other words, its purpose is to guarantee that development activities suit the development plan and its underlying standards. So in result, SW requirements directly affect the control process (as either of its inputs) and therewith directly affect the over-all quality of the product.

Trying to assure quality in the process of creating SW indicates the ability of *describing* the creation process and how this description supports the achieving of this goal. According to the school of KM then, implicit knowledge cannot be evaluated. This is the reason for making it *explicit*. The *significance* for making knowledge explicit in the process of SW development is arising from the fact that the customer asks for a SW with the basic purpose to *solve given problems*. At least from his point-of-view. But often he is unable to describe what he wants precisely. At least in *that peculiar way*, a programmer needs it to do his programming. And so, customer and supplier have to develop proper descriptions *jointly* to determine, prescribe and evaluate the intended features of the SW.

To enable the supplier to develop the product he has been asked for by the customer, it is necessary to establish a continuous process of control that escorts the entire development process as a whole. Due to the fact that control needs a defined goal before its comparing activity can start, SW requirements are essential part of the control process. When SW requirements *prescribe* what *is required* of the SW, they represent the very first link within the quality chain that guides the SW development process. Undertaken failures and omissions within the process of prescribing these requirements endanger the entire development process in consequence. So it is of major importance to do this prescribing as accurate and under peculiar precaution for long-term orientation as possible.

So in conclusion, an *explicit* process of control is necessary for achieving transparency of the development process at least as demanded by controlling (and quality) objectives. And by making it explicit, the process of control becomes transparent in itself. According to Balzert [r69] now, the *looped* process of control consists of three basic activities (or sub-processes). These sub-processes are to be found in the following table and is illustrated in image 29 ("The process of control"):

| The process of control: |
|---|
| 1. Establish plans & standards |
| 2. Evaluate reality against these plans & standards |
| 3. Eliminate the differences |

Table 49: Process of control

Of course, some details "may be impossible to specify [...] at the time the project is initiated" [r68] which forces the requirements to be *prepared* for gradual evolving. Additional changes should enter the software requirements specifications (= SRS) via a *standardized* and *documented* change process to facilitate traceability. So in addition to the postulated

*transparency* of SW requirements, it is useful to prescribe in a preferably *flexible* way where changes and additives can still be taken into consideration *post* the initial prescription.

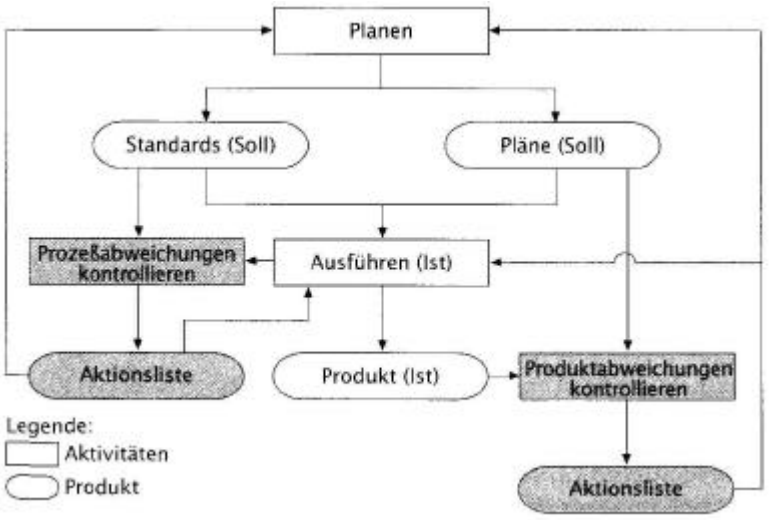



Image 29: The process of control

The following NATO document will serve a first approach to the question of SW requirements now, while subsequent section deepens the presented ideas of software requirements within a software requirement system, the SRS.

## 6.1. Identifying SW requirements

According to NATO [r68], SW requirements need to be investigated and codified as soon as possible within the process of SW development. Customer and supplier are proposed to undertake this investigation jointly. If both parties are able to introduce their expertise to the creative process of SW development, the output-SW may be complete, at least according to functionality (customer's view) and composition (supplier's view). As stated before, each party is an expert on its own scope of knowledge, but unknowing in respect to the other. So both expertises need to be merged to ensure a preferably *good* output at the end of the development process.

But when both parties investigate the requirements and try to codify them, they need to face the disabilities of language, first. Only if definitions of terms, objects, functions and inter-relationships are comprehensive from customer **and** supplier point-of-view, ambiguity can be bypassed to create transparency on the contrary. So it is recommended frequently in quoted document to ensure complete understanding of the definitions by both parties prior codifying them.

When appropriate definitions have been found, clarified requirements of the SW are managed and traced within the SW configuration management (=: SCM) and the SW project quality plan (=: SPQP). This provides objective and continual evaluation of the requirements all over the development process. If there is any kind of vagueness arising, instant clarification between supplier and customer is needed. Of course, the supplier is responsible to clarify any kind of that vagueness.

Building upon NATO statement that SCM is directly linked to QA, the tremendous importance of properly defined requirements becomes obvious: quality needs investigation, comparison and decisive evaluation. From this point-of-view, defined requirements can be seen as image of the desired SW and are indispensable counterpart for *comparison* and *evaluation* to the actual SW status. The more effort is taken in finding appropriate definitions of the SW requirements, the more valuable and thus value-*adding* quality can be achieved in an *efficient* and *effective* way.

In short, SW requirements are an essential part of the entire verification- and altering process, whereas *verification* can assure quality and *altering* frequently endangers QA for multiple (historic) reasons. Merging the aspects of verifying and altering SW counterparts leads to a common basis for all kind of activities I would like to name *playground*. This playground is now completely founded on transparency, shaping the entire development process.

This transparent playground is postulated by NATO documents implicitly: SW requirements are desired to appear entirely, consistent, unambiguous, verifiable, traceable and, of course, of correct functionality. Only if the knowledge of and about the SW requirements can be prescribed in an **explicit** way, such a playground of merged knowledge can provide a common development platform under aspects of quality. This circumstance clarifies the conjuncture of similar postulations to be found within IEEE recommendations as presented in the next section.

## 6.2. SW requirements

Of course, SW requirements need serious consideration and so the first important idea by IEEE [r67] is to manage them within a system, the SRS. This system is, on its part, recommended to be linked to the over-all project plan with the intention to guarantee its continual attention all over project duration.

Prior dealing with the essential parts of a *good* SRS, the following background information will point out the nature of an SRS in general. This point-of-view is of more formal and detailed character in comparison to the preceding one, assuring access to the information coded within this chapter in two steps: Giving a transient idea prior presenting extracted hard facts. Please note that concluding recommendations of this and the preceding section are basically the same.

Approaching the basic considerations prior achieving a *good* SRS, the following four basic topics need to be addressed: "what is the SW supposed to do?", "what does its surrounding look like?", "are there any minimum qualities?" and "are there any necessities for the development process in general?". Of course, the third question must be subdivided into performance aspects on the one hand and further SW attributes on the other. These questions can be summed up in the following consideration table:

| 5 basic considerations for achieving a *good* SRS: |
|---|
| 1. Functionality |
| 2. External interfaces |
| 3. Performance |
| 4. Attributes |
| 5. Design constraints |

Table 50: Considerations of an SRS

While the first topic tries to illuminate the nature of the SW to be developed and its purpose, the second question discusses the intended interface to it. This question considers *any* kind of connection as emerging from *human*, *SW* or *HW* inter-connection. The third consideration mainly addresses speed and duration topics of the SW performance while the fourth investigates attributes to the SW like correctness and maintenance. Here, special aspects of development like security and portability aspects enter the planning. The last item deals with peculiar SW development constraints, addressing database and programming language for instance, whereas it is important to understand that neither design nor project requirements are intended to enter the SRS — they are defined elsewhere.

The next component of a *good* SRS is addressing its environment, the over-all project plan. The SW, eventual SW parts and all their interfaces need to be addressed, here. Authors of the SRS are encouraged to define all SW requirements correctly and to consider that requirements exist either due to the nature of a task or certain project characteristics. They are encouraged *not* to describe design or implementation details and especially not to impose any additional constraints. Activities like this do not enter the SRS but other schedules like the QA plan. So the purpose of the SRS is to limit the valid scope of the design concept without specifying any. This makes complexity manageable, especially when taking into consideration that the interfaces of the SRS *itself* do affect the entire development

process in multiple phases, ranging from design and implementation over monitoring, verification and validation to phases of training and probably evolution.
From this point-of-view it becomes obvious that "the SRS has a specific role to play in the SW development process"[r67].

And so the basic characteristics of an SRS can be summed up by following table, while each bullet will accrue additional explanation in the following:

| The SRS should be... |
|---|
| 1. correct |
| 2. unambiguous |
| 3. complete |
| 4. consistent |
| 5. ranked |
| 6. verifiable |
| 7. modifiable |
| 8. traceable |

Table 51: Basic characteristics of the SRS

The SRS is **correct** if every single requirement defined within the SRS is truly one of the SW. Unfortunately there is neither tool or a certain algorithm that can help to assure correctness. This is the main reason for the SRS role to be rated as specific. A further challenge to be met is found within the process of SRS creation itself.
While customer and supplier are encouraged to investigate requirements jointly, it may become hard to find **unambiguous** *definitions* and especially *terms*. Unambiguousness is available if every single stated requirement has exactly one way of interpretation. IEEE recommendation is to assign a single, unique term to every characteristic of the final product. Three sub-clauses present possibilities how to avoid ambiguity, afterwards. Although several "languages" are imaginable to describe such unambiguous terms[36], it is recommended to "retain the natural language descriptions"[r67]. This is presumed to decrease the gap of understanding between users and developers.
The third characteristic refers to the Asian philosophy of holistic thinking and demands the SRS to be **complete**. This includes all functional, performance, design, attribute and interfaces requirements, and a cautious consideration of their inter-connection. Moreover, especially the way the over-all SW is desired to react on *valid*, *invalid* and *other* input needs serious consideration while *to be done*- or *to be determined*-statements are invalid and must be refused within a SRS at the same time. To ensure a preferably entire traceability throughout the development process, an entire labeling and referencing of all used figures and tables is recommended in addition.
The desired characteristic of **consistency** is achieved if all the requirements inter-act in the intended way through all kinds of imaginable hierarchies of definition. The fact that all these requirements are of individual importance leads to the fifth characteristic of ranking. This will determine time, effort and the jumping-off point of its peculiar development.
A **ranking** can result from this individual importance and / or stability, for instance. Of course, a SRS must be **verifiable** what is succeeding postulation. Only in case each and every requirement is verifiable, the over-all SW development process becomes verifiable as well. The general recommendation is to avoid soft terms (example given: "work well") for the sake of hard, measurable terms (example given: "output shall be produced within 20s of event x

[36] including artificial and innovative, graphic-based languages

60% of the time"). An additional idea would be to combine (or merge) both ideas on the scope of comparability, so the second example could sound like "customer accepts a waiting period equivalent to his Word™ startup" then. This can be measured and verified if necessary but provides a general frame for this particular waiting period for the benefit of an *easy* (including fast, cheap and understandable!) definition. In consequence this could lead to an easier prototype availability, as postulated by IEEE in addition. Nevertheless, this kind of definition is based on the idea of comparability and must be evaluated as *between* soft and hard definition for this reason. If any of these "soft" terms are identified as being "too soft" later, the *first step*-definition can change to a hard definition *on demand*. It is worth noticing that this practice allows the *reason* for this change to enter supplier's database in addition.
Of course, this implies the complete SRS (content and structure) to be **modifiable** to allow gradual evolution as postulated by next-to-last item anyway. The last item refers to the inevitable **traceability** of all components of the SRS. Basically this consideration is no consideration on its own but a result from preceding considerations: If each requirement's origin is described and a standardized and documented change-process available, each requirement is traceable. Forward and backward.

This completes the background information necessary prior having a look at SRS's essential parts as recommended by IEEE:

The essential parts of an SRS can be sub-divided into **general** and **specific** requirements. While the first directly arise from the *signed* contract, the latter includes a description of every input, all functions performed and every output as familiar from the ancient "input → processing → output" model. So the SRS content can be listed up as follows:

| Content of a SRS |
|---|
| **1. Introduction** |
| 1.1. Purpose |
| 1.2. Scope |
| 1.3. Definitions, acronyms and abbreviations |
| 1.4. References |
| 1.5. Overview |
| **2. Over-all description** |
| 2.1. Product perspective |
| 2.2. Product functions |
| 2.3. User characteristics |
| 2.4. Constraints |
| 2.5. Assumptions and dependencies |
| **3. Specific requirements** |

Table 52: SRS basic structure by IEEE

Although it is obvious that the third bullet is of major importance concerning the complete process of SW development, it must be excluded from this elaboration. Specific SRS requirements are too far away from the scope of integration and can be looked up in sections 5.3.1 to 5.3.7. of the quoted document. One exception to exclusion is found within the last sub-section, dealing with the need to *organize* the specific requirements. To provide a preferably *holistic* and *traceable* over-view, this kind of organizing activities must be evaluated as essential constituent part of the SRS to guarantee ability of bi-directional information flow: top-down and bottom-up.

Nevertheless, three major scopes of constituent parts provide the framework for these **specific requirements**. One out of 8 presented templates (i.e. A.5: Template of SRS Section 3, organized by feature) suggests three major scopes of constituent parts. The first group provides the approach to the SW, concerning all kinds of interfaces. There are sub-clauses dealing with user-, HW-, SW- and *communication*[37] interfaces. All of them provide further constraints and requirements to the desired SW as a whole and can be summed up as **external interface requirements**. The next group investigates the nature of all involved components, describing the desired features of the SW to be developed. They are called **system features** for that reason. Within this section, every feature needs to be described clearly and completely. This description includes the features' purpose and is based on the information chain, initiated by a certain stimulus, the functional requirements and resolved by the assigned response of the system. Finally, these system features need to be inter-connected. The way of **inter-connection** is described within the next four sections and provides background and basic structure for entire inter-connection.

This completes the SRS considerations.

## 6.3. Résumé

As already introduced at the beginning of this chapter, prescribed requirements are an essential constituent part of a distinct process of control. This process is an essential constituent part of the quality assuring process itself.

Nevertheless, assuring quality is no process related *exclusively* on well defined requirements. According to Balzert [69], it is of major importance that the QA process is guaranteed to fit the respective process model and is completely embedded into the organizational structure. And this is especially true for the controlling process(es)[38]. In addition, the nature of controlling methods and ~tools must be attributed to objectivity, flexibility, efficient and effective. But the most significant nature of controlling processes is the evaluation activity, devoted to alter and improve possibly detected insufficiencies. In either way, the result of evaluation is a three-blade knife starting the process of altering the product, altering the related standards or closing the project.

This paragraph can be summed up within ISO [r41] abbreviation PDCA (plan → do → check → act) to stress the fact that the process of SW development and its escorted chain of quality assuring activities is almost meaningless if carefully prescribed SW requirements are lacking.

[37] isn't *any* interfaces' purpose to serve communication?
[38] Please notice that this postulation is included within introducing quote on chapter 5 by Brunner, representing Arthur Andersen.

## 6.4. Peculiarities of control

Preceding résumé became necessary to stress the importance of quality-related controlling, based on prescribed requirements, but being able to distinguish the necessity of control from its devoted problems on the other hand.

Traditional opinions, criticizing that controlling methods are too expensive or time-intensive and that development-guiding standards are not available (or simply undefined) must be evaluated as erroneous. Such complaining suggests that a SW measurement technique has not been (fully) developed, yet.

So it is of major importance and interest to point out the true nature of development escorted controlling activities instead. Hopefully this will support the enthusiasm for QA related undertakings. According to Balzert [r69], again, the control related activities (or sub-processes) can be summed up in 5 basic activities:

| 5 sub-processes of control: |
|---|
| 1. Develop and prescribe standards |
| 2. Establish control- and reporting structures |
| 3. Map processes and products |
| 4. Evaluate and alter in case necessary |
| 5. Praise & black mark the achieved |

Table 53: Control related sub-processes

Completing this table, the following information must be taken into consideration, additionally: While the first item of **standard development** is devoted to the development process itself and the product in development in addition, it is worth mentioning that these standards can be devoted to the two-step-approach: A *coarse* definition that is valid for the company as a whole and a *fine* definition that is attributed to a concrete process, product or project. Standards like these are developed best in self-reliability and self-organization to reach a preferably high degree of efficiency, but can be adapted from others as well. If they are adapted, serious investigation needs to be undertaken to reach assimilation. Any chosen standard essentially needs to be devoted to the development of quality and quantity standards. The standard must prescribe the used process model and chosen QA methods. In addition, it must be devoted to develop process-, quality-, and productivity-metrics.

Nevertheless, it is of major importance to understand that standards are no end in itself but have a certain role to play, i.e. a *value-adding* role. An imaginable value-adding is achieved if teaching expenses decline, the communication process is improved or personnel inter-change among projects is simplified. Other value adding aspects can be found in the improved process of inherit experience, integrative application of experience, simplified service- and maintenance-activities and enabled control of these standards.

**Control and reporting structures** are requested to be established to enable a transparent view on the parts (or sub-processes) of the development process *any time*. Please note that this postulation is absolutely congruent to the postulation for a bi-directional information highway to be established, before. This is absolutely the same when looking at Balzerts next postulation for **mapped processes and products**: Previous postulation for a stock-taking prior entities integration results in mapped entities. Of course, multiple metrics (like Goal-Question-Metric (=: GQM), for instance) and measurement techniques can be used to achieve such a mapping.

## 6.5. Intermediate summary (II)

It is no secret (anymore) that SW requirements are inter-related to the discipline of quality assurance. The nature (or quality) of this inter-connection is that the process of *assuring* quality needs definite *knowledge* of the entity in question. As quoted from Lord Kelvin at the introducing chapter, knowledge is present only if you can measure your knowledge and express it in numbers[39]. This knowledge arises from the comparing and evaluating activities, related to the existing as well as to the postulated entity. Due to the fact that the *postulated entity* is represented by (SW) requirements, it is plain to say that eventual errors and omissions impact the whole information chain and therewith have broad relevancy all over the development process. Moreover it is inevitable that such failures especially effect the quality of the product on development-process' outcome. So you can say that requirement definition and prescribing helps to establish a *transparent playground* as postulated already.

Such a *transparent* playground is the inevitable basis to establish *effective* and *efficient* development processes with the desired (and nothing else!) product as process output. In addition one could say that *if* such a playground is established, the impact on other important aspects and branches of the company is high. The most valuable benefit may affect the company's communication culture and create a *collective mind*, devoted to achieve quality. Of course, this is one of the very best investments in a company's future imaginable.

[39] It may be crucial to realize that Kelvin's statement includes soft and hard measurement as well as it includes an organic knowledge evolving via a first (soft) and a second (hard) approach.

# 7. Over-all summary

"Nur die Vergangenheit zu verbessern ist noch kein Fortschritt;
wahrer Fortschritt heißt, sich mutig in Richtung Zukunft zu bewegen" (Khalil Gibran)

It is without affect whether restructuring activities arise from integration constraints or from the attempt to improve already existing business processes.

Basically the two excurses integrated within elaboration in hand are of major importance and have a broad impact of the restructuring activity:

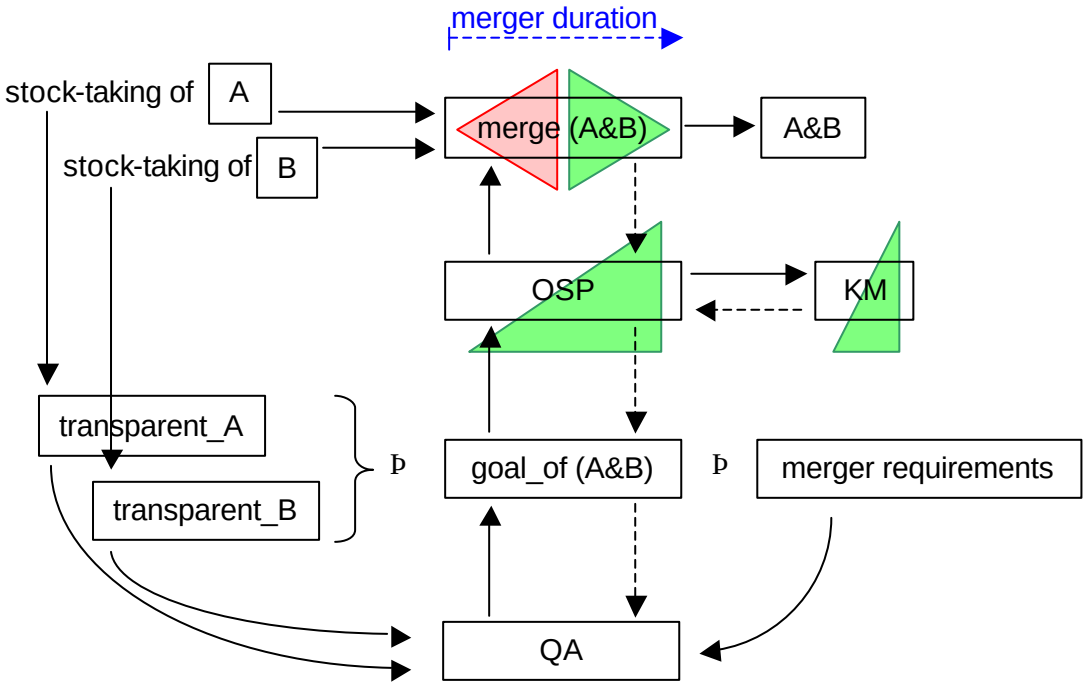



Image 30: Structure of integration attributed to quality

Of course, this illustration needs additional explanation. While the stock-taking activities provide the essential input for the merger process(es) on the one hand, they also provide pre-merger and (the desired) post-merger input to QA (remember image 18, "Localizing quality"). These goals are used to shape the OSP to support this **merger-escorting QA activities**.

While the over-all merger process (remember image 10, "The ESP") is getting more and more complex (first, red triangle), the investigated knowledge of processes, resources and responsibilities can be used to create a **map of existing processes**. In consequence, the phase of declining complexity (second, green triangle) of the over-all merger process (remember image 1, "Diversification vs. integration") can be used to prescribe their *inter-connection* and *add* the assigned process **responsibilities**. This would result in an actual map of all existing post-merger processes, consisting of inter-connected process chains with well-defined interfaces. Of course, this would a company-wide traceability of processes and responsibilities. Additionally, this can result in a resource-operation-matrix to enable a real-

time overview of the company's resources that are already assigned and available on the other hand.

The inter-connection between QA, the aspired goal of integration, the OSP and the merger process is represented in a **bi-directional information highway** (remember image 28, "Integration information structure"). This enables continual improvement and organic evolution on the one hand and continuous observing and feedback activities on the other hand.

One of the major aspects of this image is the inter-connection between the OSP and KM. In case the (merger) investigation results can be used to add value to the company as a whole, so that the company can profit from this prescribed knowledge in return, this is example for achieved (a)-type synergy ("Synergy, type (a) and (b)"). The continual merger input to the OSP will create a **robust and flexible OSP** in addition, based on all investigated process elements (remind image 27, "From OSP to project process"). This evolving enables continual improvement of the OSP due to achieving the ability to invent and introduce new process elements.

Of course, the **interfaces of the processes** are recommended to be defined as broad and soft as necessary — at least in a first step. This soft, first-step approach is necessary to enable a preferably broad adaptation and utilization to ease access and support *learning* via synergy investigation and exploitation. Beyond doubt, there are process interfaces that are hindering if defined softly. So process interfaces must be able to bear both: soft and hard definitions. Moreover, the KISS-principle ("Keep It Simple and Stupid") as taken from advertising agencies recommends to encode information as easy as possible, supporting the idea of a *preferably easy access*. But to prevent from complexity, any interface should be defined *as small as possible* on the same time.

Moreover, the **integration-related responsibilities** for the merger process are assigned to the merging operators, the quality people and —of course— the employees. The quality of the merger outcome depends on previously defined goal of the merger process, undertaken by management and is supported by the quality people and the IMT. In case the the goal is seriously investigated and prescribed soft enough, the (integration conditioned) restructuring will provide the transparent playground for a new **communication culture**, attributed to **quality objectives**.

Of course, preceding image illustrates just a *very few* aspects of integration and its devoted (sub-)process. Lots of aspects must be excluded to enable such a simple illustration of such a complex process. Nevertheless the purpose of this illustration is to show the connection of properly defined requirements and a successful output of the merger process(es). Beyond doubt, integration under common aspects of quality will enlarge the chance of integration to be evaluated as *successful* in the retrospect. And create synergy in addition.

# 8. Outlook & perspectives

"There's no teacher who can teach anything new.
He can just help us to remember the things we always knew." Enigma, "Enigma 3" (1996)

As sure as man is devoted to decisions, evolving from trial and error, the access to knowledge must happen in a structurized way and via the unknown. To challenge the future of any enterprise, this knowledge must be managed as well as any other resource. This will change the enterprises' communication culture and at least affect its vision. Of course, the term *knowledge* must be interpreted as *value adding* and align to customers' (implicit and explicit) expectations ("Learning by earning [r59]").

Finally, the closing quote is expected to support the importance of knowledge diversification and its succeeding *integration*. If undertaken seriously, your company can profit from such a continual knowledge evolution and arise to a *white dwarf* (see quote below) among the sky of competition.

> "Gewiß ist niemals eine solche Gedankenfülle auf so kleinem Raum zusammengedrängt worden. Über das ganze Universum ist eine Anzahl bestimmter Sterne verteilt, die zur Klasse der sogenannten "Weißen Zwerge" gehören. Sie sind normalerweise sehr klein, aber die Atome, aus denen sie bestehen, sind derart dicht zusammengepreßt, daß das Gewicht dieser Sterne, im Verhältnis zu ihrer Größe, enorm ist; und dies bringt eine derart starke Energieabstrahlung mit sich, daß auf der Oberfläche eine Temperatur vorherrscht, die weitaus heißer ist als die der Sonne. Das *Tao Te King* kann man mit gutem Recht einen "Weißen Zwerg" der philosophischen Literatur nennen, so gewichtig ist es, so kompakt, so sehr gemahnt es an einen Geist, der seine Gedanken mit der Energie der Weißglut abstrahlt."
>
> Dr. Lionel Giles [r71]
>
> Direktor der Orientschriften-Abteilung am British Museum, Übersetzer des Tao Te King (1937)

# 9. Appendix

## 9.1. Abbreviations

| | |
|---|---|
| BMBF | Bundesministerium für Bildung und Forschung (German Authority) |
| BPI | Business Process Improvement[r43] |
| BU | Business Units |
| BW | Bundeswehr (German Armed Forces) |
| CEO | Chief Executive Officer |
| CMM | Capability Maturity Model |
| DFG | Deutsche Forschungsgemeinschaft |
| ESP | Evolutionary Spiral Process (by SPC) |
| FAQ | Frequently asked questions |
| FMEA | Fehlermöglichkeits- und Einfluß-Analyse |
| GQM | Goal-Question-Metric (see [69], pp. 263 ff.) |
| HR | Human Resources |
| HW | Hardware |
| IMT | Integration Manager Triangle as defined in [d2] |
| IPCS | Integrated Process Control System |
| IS | Information System |
| IT | Information Technology |
| KM | Knowledge Management |
| LCC | Life-Cycle-Costs |
| M&A | Mergers and Acquisitions |
| NATO | North Atlantic Treaty Organization (Brussels, Belgium) |
| OS | Operating System |
| OSP | Organizational Standard Process (by SPC) |
| QA | Quality Assurance |
| QFD | Quality Function Development |
| QM | Quality Management |
| QMS | Quality Management System |
| R&D | Research & Development |
| RSI | Rationalization, Standardization and Interoperability |
| SCM | SW configuration management (by NATO) |
| SEPG | Systems (or Software) Engineering Process Group |
| SOP | Systems (or Standard) Operating Procedures |
| SPC | Software Productivity Consortium |
| SQP | SW QM Plan (by NATO) |
| SQS | SW-QMS (by NATO) |
| SRS | SW Requirements Specifications |
| SSM | Soft Systems Methodology [r70] |
| SW | Software |
| TQM | Total Quality Management |

## 9.2. Definitions

| | | |
|---|---|---|
| [d1] | Merging operators | The people assigned with the "performing" or "doing" of a merger; in hierarchy they are between the managers of both firms on the one hand, and the staff of both firms on the other hand. In literature, they are given names like "merger executive", "merger integration team", "integration task force" or "integration experts". As I see it, 'merging' stresses the subject (ie. the decision to merge) and 'operator' stresses the very important fact that merging is a *process*, needing and consisting of *activities*. |
| [d2] | IMT | Integration Manager Triangle. Its elements are three groups of people named "think it!", "do it!" and "how to". Certain "additives" like a reporting manager are imaginable and recommendable. |
| [d3] | Expert | "It often adds to the stimulus —human nature being what it is— to be caught in a situation where one is counted as an 'expert', expected without fail to produce the answers! Students in some parts of the world see their professors decked out in a panopoly designed, so they think, to impress them. That is perhaps one side of a great truth, but isn't the other side more relevant here? Does not the formality put the professor under yet one more pressure to reach out into chaos, to lay hold of something both new an true?"<br>(John Archibald Wheeler, *At home in the Universe*) |
| [d4] | Business @ the Speed of Thought | This term is introduced in corresponding book by W. Gates (Penguin, 1999) |
| [d5] | Successful merger | Unfortunately there is no common definition available providing *hard* criteria of what makes a merger successful. More effort has been put in defining the counterpart of success as summarized in the *failure* [d7] definition. |
| [d6] | Culture | Culture dependents on the existence of *cultural assets*. In short, the transferring of them aims to simplify the process of learning and re-learning across and within generations [r35]. Note that culture is attributed not to human *individuals* but to *all* humans within one area of cultural identity *over times*. |
| [d7] | Failure of a merger | "If you are not sure about your definition, you are not alone. In the past 30 years, scholars have published *hundreds* of studies of post-merger financial performance, and few have defined failure —or, conversely, success— in exactly the same way. When failure is defined as an inability to reach certain financial norms, such as significant growth in net income or return on equity, reported failure rates can be high — up to 80%" [r2].<br>As quoted from another study, "differences (in opinions) underlie the *public policy debate* whether takeovers are desirable or not." [r26] And in the end, this is nothing but a question of advertisement and fashion. |
| [d8] | Integration entrepreneurs | "Integration entrepreneurs are confident, extrovert and do enthusiastically approach to changes in general." [r4] |

## 9.3. Keywords

For "filing" and "finding" I like to suggest using the following keywords (in alphabetical order):

- Acquisition
- Alliance
- Amalgamation
- Blending
- Business Process Reengineering / BPR
- Coalition
- Consolidation
- Culture Improvement
- Engineering
  (including Re-Engineering and Process Re-Engineering)
- Fusion
- Globalization
- Incorporation
- Integration
  (including Task Integration)
- Joint-Venture
  (including Joint Processing)
- Merger
- Quality Assurance / QA
- Structural Change
- Synergy
- Takeover
- Union

## 9.4. References:


[r1] "Alles oder nichts" in: Der Spiegel (Vol. 52/25.12.2000), p. 133

[r2] A. R. Lajoux, "The Art of M&A Integration" (McGraw-Hill, 1998)

[r3] "Best Mergers and Acquisitions Advicer" in: Euromoney (40 / July 2000), p. 40

[r4] Laura Empson, "Merging professional Service Firms" in: *Business Strategy Review* (Vol. 11/2, 2000), pp. 39-46

[r5] P. Haspeslagh & D. B. Jemison, "Managing Acquisitions: Creating Value through Corporate Renewal" (New York: Free Press, 1991)

[r6] M. Sirower, "The Synergy Trap: How Companies Lose the Acquisition Game" (New York Free Press, 1997)

[r7] C. L. Scheck and A. J. Kinicki., "Identifying the antecedents of coping with an organizational acquisition: a structural assessment" in: *Journal of Organizational Behaviour* (Vol.21, No.6, 2000), pp. 627-648

[r8] B. R. Lowndahl, "Strategic Management of Professional Service Firms" (Handelsshojskolens Forlag, Copenhagen, 2000)

[r9] B. Garette, "Alliances vs. Acquisitions: Choosing the Right Option" in: *European Management Journal* (Vol. 18 (1), 2000), pp. 63-69

[r10] G. Franck, "Mergers and acquisitions: competetive advantage and cultural fit" in: *European Management Journal* (Vol. 8/1, 1990), pp. 40-43

[r11] J. Birkinshaw, H. Bresman and Lars Håkanson, "Managing the Post-Acquisition Integration Process: How the Human Integration and Task Integration Processes interact to foster Value Creation" in: *Journal of Management Studies* (Vol 37/3, 2000), pp. 395-425

[r12] D. B. Jemison and S. Sitkin, "Acquisitions: the process can be a problem" in: *Harvard Business Review* (March-April 1986)

[r13] M. Miles and M. Huberman, "A Handbook of Qualitative Analysis" (Sage, Newbury Park, 1984)

[r14] A. L. Sales and P. H. Mirvis, "When cultures collide: issues in acquisition" (1984) in: J. R. Kimberley and R. E. Quinn, "New Futures: The Challenge of Managing Corporation Transitions" (Homewood, IL: Dow Jones Irwin), pp. 107-33

[r15] P. Shrivastava, "Postmerger Integration" in: *Journal of Business Strategy* (Vol 7, 1986), pp. 65-76

[r16] G. Hedlund, "Autonomy of subsidiaries and formalization of headquarters-subsidiary relationships in Swedish MNCs" (1981) in:
L. Otterbeck., "The Management of Headquarter-Subsidiary Relations in Multinational Corporations" (Gower Publishing Co., Hampshire)

[r17] K. Roth and A. Morrison, "Implementing global strategy: characteristics of global subsidiary mandates" in: *Journal of International Business Studies* (Vol.23, 4), pp. 715-36

[r18] D. T. Bastien, "Common patterns of behavior and communication in corporate mergers and acquisitions" in: *Human Resource Management* (Vol. 26, 1987), pp. 17-33

[r19] M. E. Porter, "From competetive advantage to corporate strategy" in: *Harvard Business Review* (Vol 65, 1987), pp. 43-59

[r20] W. Korintenberg, "Strategisches Personalmanagement für die öffentliche Verwaltung" (Gabler-Edition, 1998)

[r21] G. Ederer, "Das Märchen von 'Made in Germany' — Neues aus der Servicewüste" (10.7.2000, *3sat*)

[r22] Sarah A. Sheard, "The Frameworks Quagmire, A Brief Look" (SPC, *Quagmap*-Tool Documentation)
[r23] Sarah A. Sheard and C. L. Miller, "Merging Processes After Corporate Acquisitions" (SPC-99012-MC, V 01.00.02, Oct. 1999)
[r24] R. Rothschild, J. S. Heywood, K. Monaco, "Spatial price discrimination and the merger paradox" in: Regional Science & Urban Economics (Vol. 30/5, 2000), pp. 491-506
[r25] S. C. Bae and S. Sakthivel, "An Empirical Analysis of Exchange Ratio Determination Models for Merger: A Note" in: *Journal of Business Finance & Accounting* (Vol. 27, [3/4], 511-21, 2000)
[r26] P. M. Healy, "Does corporate performance improve after mergers?" in: *Journal of Financial Economics* (Vol. 31, 135-76, 1991)
[r27] J. Child, D. Faulkner, R. Pitkethly, "Foreign Direct Investment in the UK 1984-1994: The Impact on Domestic Management Practice" in: *Journal of Management Studies* (Vol. 37/1, 2000), pp. 141-166
[r28] K. Morton, "Most successful strategic merger" in: *Euromoney* (Vol. 327, 1996), p. 70
[r29] B. A. Blonigen and C. T. Taylor, "R&D Intensity and Acquisitions in High Technologies: Evidence from the US Electronic and Electrical Equipment Industries" in: *Journal of Industrial Economics* (Vol. 48, 2000), pp.47-70
[r30] K. Pal and O. Palmer, "A decision support system for business acquisition" in: Decision support systems: DSS; the international journal (Vol. 27 [No. 4], 2000), pp. 411-429
[r31] Prince U. C. Agundu and N. O. Karibo, "Risk analysis in corporate merger decisions in developing Economies: A Case Study of the Lipton-Lever brothers in Nigeria" in: *Journal of Financial Management & Analysis* (Vol. 12 [No. 2], 1999), pp. 13-17
[r32] G. Lang and P. Welzel, "Mergers Among German Cooperative Banks: A Panel-based Stochastic Frontier Analysis" in: *Small Business Economics* (Vol 13 [4], 1999), pp. 273-286
[r33] R. Morck, "Do Managerial Objectives Drive Bad Acquisitions?" in: *Journal of Finance* (Vol. 45, 1990), pp. 31-48
[r34] J. Franks, R. Harris and S. Titman, "The postmerger share-price performance of acquiring firms" in: *Journal of Financial Economics* (Vol. 29, 1991), pp. 81-96
[r35] W. Miram and K.-H. Scharf, "Die menschliche Kultur" in: *Biologie heute SII* (Schroedel, 1989), p. 374
[r36] S. Abbasi and P. Dellinger, "Background Questionnaire" in: *Ascend-Lucent Quality Systems Integration (Core Team)* (Murray Hill, March 1999)
[r37] G. Hamel, "Wie IBM im eBusiness zum Kraftprotz wurde" in: Harvard Business Manager (Vol. 23/1, 2001)
[r38] Bundesminister für Forschung und Technologie, Broschüre: "Programm 'Qualitätssicherung 1992-1996' " (PFT, Postfach 3640, D-76021 Karlsruhe, 1999)
[r39] R. Stoll, "Konzeption und Realisierung einer Qualitätssicherungs-Erfahrungsdatenbank zur Analyse von Kennzahlen im SW-Erstellungsprozeß" (University of Applied Sciences, 1999)
[r40] ISO, "ISO/FDIS 9000:2000(E)" (ISO, Case postale 56, CH-1211 Geneva 20, 2000)
[r41] ISO, "ISO/FDIS 9001:2000(E)" (ISO, Case postale 56, CH-1211 Geneva 20, 2000)
[r42] H. Willke, "Systemisches Wissensmanagement" (Verlag Lucius&Lucius, 1998)
[r43] H. J. Harrington, "Business Process Improvement" (McGraw-Hill, 1991)
[r44] J. Brunner, "Performance-Meanagement und Balanced Scorecard in der Praxis" in: *io management* (Nr. 7/8, 1999, BW-File "UU 2453")
[r45] H. Brill, "Geopolitik und Geostrategie Begründung, Degeneration, Neuansätze einer sicherheitspolitischen Grundlagendisziplin" (SB 0748, Amt für Studien und Übungen der Bundeswehr, Bergisch Gladbach, 1993), [abstract here]

[r46] J. Böckmann, "Aspekte der Standardisierung, ein Beitrag zur Interoperabilität von Streitkräften" (SB 2030, FIZBw, 1995)
[r47] NATO, "Bestimmungen für die Planung, Entwickung, Beschaffung, Einführung und Nutzung von Wehrmaterial und Datenverarbeitungsvorhaben" (Allg. Umdruck Nr. 220, Bonn, 1994)
[r48] NATO, "NATO-Qualitätssicherungsforderungen für Software-Entwicklung" (PP 2185, Beuth Verlag GmbH, Berlin, 1993)
[r49] NATO, "NATO-Qualitätssicherungsforderungen für Entwicklung, Konstruktion und Produktion" (PP 2197, Beuth Verlag GmbH, Berlin, 1995)
[r50] NATO, "NATO-Qualitätssicherungsforderungen für Qualitätsprüfung" (PP 2020, Beuth Verlag GmbH, Berlin, 1997)
[r51] URL: *http://www.bundeswehr.de/bundeswehr/geschichte/innere_fuhrung.html* (25.09.2000, 3975 bytes)
[r52] F. Haist and H. Fromm, "Qualität im Unternehmen" (Carl Hanser Verlag, München, 1989)
[r53] T. Pfeifer , "Untersuchung zur Qualitätssicherung. Stand und Bewertung — Empfehlung für Maßnahmen" (Forschungsbericht KfK-PFT 155; Kernforschungszentrum Karlsruhe, 1990)
[r54] H.-P. Wiendahl, "Betriebsorganisation für Ingenieure" (Carl Hanser Verlag, München, 1989)
[r55] W. Geiger , "Qualitätslehre" (Vieweg, 1986)
[r56] C. H. Beck , "Bürgerliches Gesetzbuch" (C. H. Beck Verlag, München, 1987)
[r57] C. Malorny , "Qualitätsmanagement" (Spektrum der Wissenschaft, 1997)
[r58] J. Bank , "Total Quality Management" (Pearson Education Ltd., England, 2000)
[r59] T. Darnstädt, "Start-up ins Leben / Was sollen Kinder lernen?" in: Der Spiegel (14/02.04.2001)
[r60] P. Ghemawat and F: Ghadar, "Globale Megafusionen — ökonomisch nur selten zwingend geboten" in: Harvard Business Manager (Vol. 23/1, 2001), pp. 32ff
[r61] R. Bohn, "Probleme wirklich lösen — nicht nur die Folgen bekämpfen" in: Harvard Business Manager (Vol. 23/1, 2001), pp. 58ff
[r62] F. F. Reichheld and P. Schefter, "Warum Kundentreue auch im Internet zählt" in: Harvard Business Manager (Vol. 23/1, 2001), pp. 70ff
[r63] C. v. Campenhausen and A. Rudolf, "Shared Services — profitabel für vernetzte Unternehmen" in: Harvard Business Manager (Vol. 23/1, 2001), pp. 82ff
[r64] E. Abrahamson, "Unternehmenswandel ohne Schmerzen" in: Harvard Business Manager (Vol. 23/1, 2001), pp. 95ff
[r65] S. Wetlaufer, "Eine neue Spezies — angestellte Millionäre" in: Harvard Business Manager (Vol. 23/1, 2001), pp. 101ff
[r66] M. Kuppinger and M. Woywode, "Vom Intranet zum Knowledge Management — Die Veränderung der Informationsstruktur in Organisationen" (Carl Hanser Verlag, 2000)
[r67] IEEE, "IEEE Recommended Practice for Software Requirements Specification" (Std 830-1998)
[r68] NATO, "NATO-Leitfaden für AQAP-150" (PP 2017, Beuth Verlag GmbH, Berlin, 1994)
[r69] H. Balzert, "Lehrbuch der Software-Technik, Band 2" (Spektrum Akademischer Verlag, 1998)
[r70] D. M. Walters, "Soft Systems Methodology" (from a course presented by David Walters at the Fachhochschule Würzburg-Schweinfurt-Aschaffenburg in October 1999)
[r71] R. L. Wing, " Der Weg und die Kraft - Tao-te-king" (Bechtermünz Verlag, 1999)