

# Relevant Factors for Implementation of Operational-level IS/ICT Processes in Small IT Organizations

*Jaroslav Kalina*

*Department of systems analysis  
Faculty of informatics and statistics  
University of economics in Prague  
W. Churchill 4, 130 67 Praha 3  
E-mail: xkalj34@vse.cz*

**Abstract:** *Having IS/ICT processes compliant according to well known standards like COBIT or ITIL is relatively popular especially among larger organizations (to which these standard are primarily aimed). This paper discusses how standardization of processes affects or is affected by a selected set of process characteristics and tries to provide general guidelines which should be considered prior to their implementation (standards). Special attention is paid to the specifics of small IS/ICT organizations since implementation of these frameworks (intended for rather larger organizations) represents in this context more demanding endeavor.*

**Keywords:** factors, implementation, processes, IS/ICT, maturity, definition, methodologies

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## 1. Introduction

The aim of this paper is to discuss key factors which affect the overall performance of operational processes in IS/ICT organizations in the context of implementing IS/ICT management frameworks, success rate of their implementation projects and to propose a set of recommendations for potential implementers. Special focus will be paid to the specifics of small IS/ICT organizations/teams since they constitute the vast majority of the IS/ICT organization population [SBAG, 2004].

The perspective which we take in this paper results from critical comparison of currently wide spread frameworks for IS/ICT service management [ITIL, 2007a-e], [COBIT, 2007] and [CMMI, 2002] with the late development in organization science given to the increasing rate of application of concepts of complex systems theory for studying and interpreting variety of organization phenomena.

Conclusions which we draw in this paper, are based primarily on synthesis of approaches (as mentioned above and also further in this paper) and on author's own personal experience resulting from two years on position of business process analyst in a major consumer electronics retailer in Czech republic.

## 2. State of the field

The notion of Information system and It's relationship with the business organization, as we intend to use in this paper, corresponds to that of Peter Checkland, where information system is "A system which processes selected data in order to provide information support relevant to the people taking purposeful action." [CHECKLAND, 1998]. This clear distinction to the system who serves (information system) and the system who's being served (business system) makes a starting point for further development in the field. Benbya and McKelvey have stressed the co-evolutionary nature of the relationship between the business and information system [BENBYA, MCKELVEY, 2006] and so did later [NASH, 2009] and [ECKHARDT, 2009]. Given the nature of this relationship between business organization and It's supporting information system and the fact that business organizations are being subjects of various complex system phenomena as pointed out by [ANDERSON, 1999], [BERGMANN-LICHTENSTEIN, 2000] and [CAMPBELL-HUNT, 2007] implies that complex system theory plays a significant role, while thinking about information systems, as well.

In a set of papers Phil Rosenzweig polemists whether there exists a relevant correlation between established frameworks for company management [ROSENZWEIG, 2007a,b] and the overall performance of the company. In their study of the impacts of adoption of their Software engineering institute's Capability Maturity Model Integration [CMMI, 2002] based model for business process management maturity Rosemann and de Bruin concludes that they haven't found any positive correlation between the higher level of business process management maturity and process performance [ROSEMAN, DE BRUIN, 2004]. The structure of categories in their model bears many similarities to that of Michael Hammer's Process and Enterprise Maturity Model (PEMM) [HAMMER, 2007] and to the categories of resources in the COBIT 4.1 framework [COBIT, 2007].

This all goes hand in hand with the point made by Peter Checkland in other part of his book [CHECKLAND, 1998], that human systems represent much more messy environment than most methodologies dare to admit, especially those related to IS/ICT development. This supports the point made by [HANNAN, FREEMAN, 1984] and later elaborated by [MOREL, RAMANUJAM, 1999], that given the inner complexity of organizations and lack of it's understanding<sup>1</sup> lead to perceived-as-random behavior of companies.

### 3. Key terms

Although we're not a proponents of rigorous definitions, we acknowledge that in a relatively young fields like applied informatics, organization sciences and so on, which are typical by lacking a generally accepted common understanding of the meaning of key terms by which they operate, It's important to provide at least a working definition of several most frequent terms which we're going to use throughout this paper in order to avoid potential misunderstandings.

**Standardization** - a process of developing an uniform specification of something and applying it

**Business Process** - a sequence of related activities which transform inputs into outputs and produce altogether a product/service which provides a value to the customer (internal or external).

**IS/ICT Process** - fundamentally also a business process where the customer is the business organization and provider is either autonomous IS/ICT organization or organizational IS/ICT sub-unit.

**Model** - anything used in order to represent anything. In this sense we can count as models for example schemas in modeling notations, but what is mode important, to such a definition fit even methodologies or specifications of processes and routines, regardless if they're depicted in a specialized modeling language or plain/structured text.

**Process instance** - a single invocation of a particular business process related usually to solving particular request/order

#### What is a small IS/ICT organization?

Before starting with drawing any recommendations and conclusions there is definitely a need to provide at least a working definition of what is going to be conceived as a small IS/ICT organization throughout this paper. Since field of organization science doesn't, after more than 50 years of it's existence, yet provide us with a commonly accepted definition of what an organization is, defining what in fact "small IS/ICT organization" means, is nonetheless a challenge by itself. Therefore we'll not provide a definition in classical sense but we'll name several of the most important characteristic which a small IS/ICT organization is supposed to have [SBAG, 2004]:

- Number of members is usually limited to 20-30
- Fuzzy borders of competencies due to frequent shifting of organizational role content (people have to do what is ad hoc needed at the given time)
- Managed by the founder with usually a technical education (in case this is not an IT organizational sub-unit of a larger organization)
- Informal and flexible routines (routines bend around individuals and not individuals around routines)
- Dependent on individuals (problematic replaceability) not aware of regulations self-helping rather than seeking advice from a specialists

There is a slight distinction between situation when we think about standalone IS/ICT organizations and IS/ICT organizations as part bigger organization. In case of IS/ICT organization being a department of a bigger organization it's character becomes in certain areas more formal than in case

<sup>1</sup> Even to such an extent as talking about impossibility to grasp the complexity of relationships between relevant entities and their instances.

it'd be an independent organization. The reason behind this assumption is that in case of being just and organizational sub-unit the organization will have to abide to company-wide standards and certain functions will be performed by other specialized departments (like human resources)

#### 4. Comparison with other approaches to management of IS/ICT

Before discussing the factors which affect the shape of processes in organizations in general, and thus in IS/ICT departments/organizations as well, we'll specify how this set of concepts, which'll be introduced later, relates to other existing concepts and models of IS/ICT management in organizations, especially those developed at the Department of Information Technology at University of Economics in Prague. Similar areas of interest, from the point of view on IS/ICT management, as I touch in this paper can be also seen in these approaches.

##### 4.1 Process perspective

Since we're talking in this paper about processes in small IS/ICT organizations it's obvious that we're stressing the notion of organization as a set of its processes (which is an opposite approach to that of "functional silos" as distinguishes [HAMMER, 1993]).

In [VORISEK, 2008, p. 142] a "*conceptual model for process based management of enterprises*" is introduced (part of MMDIS<sup>2</sup> methodology), which describes the cascade of layers of company's management from strategic goals on the top, through several intermediate layers (process and product/service centered), to management of resources on the very bottom. This model shares similar perspective with more IS/ICT oriented model SPSPR<sup>3</sup> [VORISEK, 2008, p. 154], which also describes management layers and relationships between them, but in the case of SPSPR focuses on the alignment of business strategy and IS/ICT services.

From the point of view of this paper it's important to note, that even though principles described in these two models are valid regardless of the size of the selected company, in the specific case of small organizations there may not be a clearly defined distinction between these management layers (in the organization structure, etc.) and communication between distinctive layers may not be realized in such a disciplined way as these models indicated (for example due to merging of roles and management layers in small businesses).

##### 4.2 Role of knowledge

In [VORISEK, 2008, p. 147] principles of method called KBPR<sup>4</sup> are described. This approach defines several levels of granularity of definition of processes, particularly in IS/ICT area, but not only there. Consequently a general impact of low/high granularity of definition is being discussed. The main notion is that of possibility (if not even necessity in some cases) to compensate lower level of employee qualification with processes defined to a high level of granularity and vice versa.

Several arguments as presented in the KBPR method (concerning impacts of processes defined to high level of granularity) are similar to those which we present in this paper (especially in the section where impacts on human aspects of a particular process are being discussed). Consequently we present several other arguments not covered in KBPR or left explained superficially (see the following sections). Mainly the cost-quantity relationship, as described mainly in figure 1.

##### 4.3 Standardization through IS/ICT

In [VORISEK, 2008, p. 72] we read that "*IS/ICT is one of the most suitable tools for standardization of business processes*", this is indisputably true, since IS/ICT doesn't allow (if we focus purely on SW and HW aspects of IS/ICT) its users to behave in a way which contradicts the business logic programmed<sup>5</sup> into it.

Nevertheless, this can be also a source of several drawbacks. The first argument is, whether the business logic embedded in the IS/ICT corresponds with logic of the business process itself. This can be an issue in case of the TASW, where this typified solution may not cover certain specifics of the given process, and, in the end, it may force the own process to change, in order to fit to the logic of IS/ICT. Other solutions are either to customize or adapt the TASW solution to respect the desired

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2 Multidimensional Management and Development of Information Systems

3 Strategy, Business Process, IS/ICT Services, IS/ICT Processes, IS/ICT Resources

4 Knowledge based process reengineering

5 SW embeds the knowledge of its creators in itself

business logic (this of course consumes resources of the company) or to throw it away<sup>6</sup>, which results into the investment into it to be wasted.

Consequently standardization through IS/ICT may act as an inhibitor of change in certain cases (especially when the underlying solution is not easily reconfigurable). In certain case the cost related to modifying of the IS/ICT may overweight the gains from it. If there is an opportunity on the market, which requires quick reaction from company, there is a risk that the modification of company's system will take so much time, that the short term opportunity will be wasted<sup>7</sup>. We offer more detailed explanation of the relationships between benefits and cost of standardization in the following sections of this paper (see figures 1 and 2 and the related commentary).

#### 4.4 Size and increased rigidity

In [VORISEK, 2008, p. 71] an idea of relationship between the size of the organization and the desirability of standardized communication processes is being introduced. As we argue in the following sections, it's not a purely just a matter of communication processes but, It's a tendency which affects processes of various kind. In large organizations we have to coordinate work effort of huge quantity of people. Managing each and every employee directly by one person is out of question, since, as we argue in the following section, there is a limit to what human mind can keep track of. Therefore delegation of responsibilities and setting rules and processes to follow is a proven way to cope with management of extensive organizations.

An interesting point is made in a paper written Hannan and Freeman [HANNAN, FREEMAN, 1984], where studied a population of companies in economy. Their finding was that, the highest death rate of companies is among the young ones. Upon examining the cause they concluded that one of the major cause of death of company was high dependence on individuals, meaning they were irreplaceable resulting in a collapse of company or a serious problem when they left the company (regardless of the reason). As we was recently examining frameworks like [COBIT,2007] and [CMMI, 2002] a similar idea, as pointed by Hannan and Freeman, was also made. For example Cobit framework imposes, as a generic control objective on every process, a requirement that the execution of a given process is not to be dependent on a single individual.

These ideas correspond with the concept of autopoiesis (self-reproducibility). In order for the company to keep existing in a long run it has to continually reproduce itself, meaning maintaining a particular structure and keep values of certain factors/aspects in given limits which enable company's existence to continue (like achieving profit, etc.). As cells in human body are constantly replaced by a new ones, then individuals flow in the company and after some time they leave, resulting in a need find a replacement. Having standardized processes which restrain the behavior of individuals makes the behavior of the system more predictable and helps to ensure that newcomers interact with the rest of the system in a desired way. This partially corresponds with, what has already been discussed in the

6 "Shelfware" is a term for SW and other IS/ICT related products which were bought but were used only for a short period of time, or even never used. Also a having a system which user's have to bypass (to some extent) in order to successfully achieve their business process related goals could be seen as a case of shelfware as well.

7 A brief example from author's own personal experience: While working for a major consumer electronics retailer company in Czech republic, the IS/ICT department (where I worked at the given time) was faced with the request from the marketing department. Marketing department came with the idea to give a special vouchers to customer who exceed certain value of purchased product, which will be exchangeable for energy-saving light bulbs or to receive a discount while purchasing certain ecologically considerate electronics (like low consuming fridges, etc.). At the given time ecologically considerate electronics were given a large attention in media so the was quite good. In order to limit potential fraud opportunities (each vouchers had a unique serial number which was supposed to be stored in the system) and to rationalize the evidence of these vouchers, IS/ICT department was asked to modify the functionality of the POS module (point of sale = cashdesk module) so it could process transactions with these vouchers in a relatively similar manner as several already existing voucher types used by that company at the given time. Upon after few days of exploring the possibilities to implement these new capabilities into POS module it was discovered, that it'd require a modification of piece of code which was used by almost every other cashdesk transaction (especially classical sales), so that modification of this part will consequently require throughout reworking of the logic of every type of sale available in POS module (the number of these was exceeding 10). Consequently, It was also discovered that the way POS module was linked with the accounting module, will require a modification as well in order, the transactions with these new vouchers to be properly processed according to accounting standards and meet also legal requirements. The preliminary assessment of impacts of these modifications showed that cost related with the modification of affected modules of IS/ICT will outweigh expected gains from this promotional action, resulting in ceasing this effort and letting the opportunity go.

context of KBPR, meaning that process standardization act as a externalizing of individual's knowledge making it to some extent available to everyone, thus decreasing dependability of organization on individuals.

## 5. Complexity aspects

This section (and the two following) discuss how standardization in a sense as mentioned above affects a selected set of process characteristics in an organization. This set of characteristics partially derives from factors affecting the management of company's IS/ICT, as discussed in [VORISEK, 2008], and is based also on our previous work<sup>8</sup> [KALINA, 2009] and a set of criteria for assessing process maturity made by Michael Hammer [HAMMER, 2007].

According to CMMI [CMMI, 2002] processes are distinguished into maturity levels (initial, managed, defined, quantitatively managed and optimized). According to the description of the first level of maturity labeled as "Initial", the process tends to display the following set of characteristic: ad hoc execution, no guidelines for it's performers and basically it's not commonly conceived as a process at all, rather a loosely coupled set of activities.

For a process to be long at this maturity stage, it means only that the number of occurrences of activities related to this process is so low that even such a poor state of process definition is by itself not an obstacle. What conditions can, in a long run, keep the company from improving the processes state? The following two cause are fundamentally different, although both deal with complexity. The first cause results from low structural complexity and the second from high dynamic complexity :

- **Mentally comprehensible** - when the amount of occurrences of instances of a particular process remains low, it's possible to cope with this small amount mentally regardless if we're taking the perspective of the process performer or process manager. With the increasing amount of instances of the process it becomes more difficult to keep the track of the status of each of the process instances (especially when each of these instance would be slightly different) which results in the pressure to prescribe a unified pattern according which each of the process instances would be processed. In other words in case of lower rate of occurrence the structural complexity remains low, meaning that there are lesser entities to which which attention has to be paid.[BEER, 1994]
- **Fluctuating environment** - in order to draw standards for a selected set of processes, the environment in which these processes operate has to be to some extent stable in order for the process implementation team to be able to draw routines. If the environment changes rapidly then the process, in order to remain consistent with the requirements of the environment, has to change as well. In other words if the process changes rapidly then once created specification can become useless after the first major change of the particular process. [CHECKLAND, 1981]

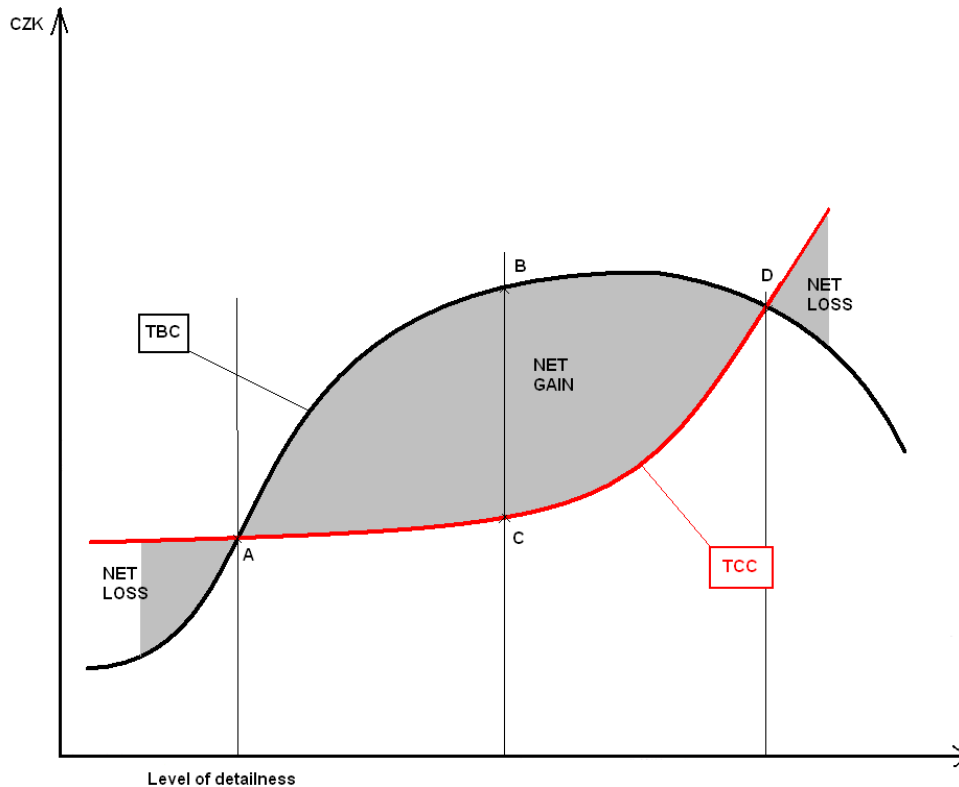
## 6. Cost/Benefit ratio

Standardization efforts require an investment of time, funds and human labor, as any other project, in order to be realized. The fundamental argument is that, as in case of any project, a cost-benefit analysis should be performed to support the decision of running or not running the project. The possible scenario is, that due to marginality of a particular process, from the company's overall scope, the benefits gained by increased level of granularity of specification (and related increase in process maturity as discussed in [KALINA, 2009]) of a selected process may not outweigh the costs related to such an activity. On the other hand in case of a relatively important<sup>9</sup> business process, even a relatively small per-instance cost reduction (or performance increase) may lead to significant savings (incomes) in the absolute measure.

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8 The paper written in 2009 explores, to which extent can process modeling contribute to achieving higher maturity according to Hammer's PEMM [HAMMER, 2007]

9 We can measure the importance of a particular business process for example by it's contribution to the company's overall output.



**Fig. 1: Development of benefits and costs of standardization of business processes**

Figure 1. displays the relationship between increasing level of granularity of process specification (horizontal axis) and its effect on the costs of standardization of business processes and benefits gained through this standardization effort. Both costs and benefits are depicted in monetary units (vertical axis - CZK). The two curves depicted here are:

- **TBC** - Total benefit curve
- **TCC** - Total cost curve

Figure 1. represents an ideal situation and serves for the purpose of describing overall principles of development of both curves. In the following sections we'll discuss factors which affect both the shape and position of each of these curves.

The TBC depicts the progression of overall aggregated benefits/gains due to the increasing level of detailedness of definition of standardized process. In this case, I include in the overall benefits not only those which are clearly attributable to the improved performance (or lower costs) of the process, and thus straightforward countable on a monetary basis, but also those which can't be explicitly expressed on a monetary basis (basically qualitative characteristics of a particular process).

The TCC depicts the progress of costs of ongoing standardization due to the increasing level of detailedness of standardized process. The cost of the standardization effort has a tendency to increase due to the increased level of detailedness of the process definition. Process specification at a very high level of detailedness represents an artefact characterized with a high amount of structural complexity, e.g. high amount of entities and relationships between them. This increasing complexity is the main source of rising costs of process specification because it directly demands more resources to underpin it. The complexity of process specification grows basically by two mechanisms, at first with the increasing wideness of coverage of process activities by such a specification, more and more activities have to incorporate into such a specification (a more elaborated view on complexity is presented in [BEER, 1994]). Secondly, in case of increasing the level of detailedness of already depicted activities, e.g. more elaborated description of relevant characteristics and mapping and defining additional relationships between them. The increasing coverage (e.g. widening) of process specification has moreover linear character however increasing the level of detailedness of specification (e.g. deepening) is a source of exponential increase of resource requirements to successfully cope with the increasing complexity (this can also lead to the so-called "analytical trap" described in [Hammer, 1993]).

In figure 1. we've also depicted three distinctive situations of the combination between costs and benefits. The first one (marked by letter A) depicts a moment where the benefits gained through standardization equals the cost related to with achieving current level of granularity of process specification. The example in figure one shows also that before this point, the company is making a net loss. On the other hand after this point, benefits overweight costs and the company is making a net gain.

The second situation represents a moment where the gap (marked by points B and C) between TBC and TCC is the largest, meaning the company is making the highest gain. In this context then, this point is representing potential optimum in the whole schema.

The third situation (represented by point D), is an opposite to the first situation as depicted by point A. After this point cost start again to overweight benefits and the company is starting to make net loss again.

In the own interest of rationally behaving organization is to have transparent understanding of related costs and benefits of such projects in order to be able to distinguish between beneficiality and harmfulness of ongoing standardization. Also the delay between an action and related feedback plays a significant role in this context.

## **7. Factors affecting costs and benefits of standardization**

Previous section introduced my cost-benefit focused point of view on standardization of business processes in organizations. Curves presented in figure 1. represent an illustrational schema to help with the explanation of how are in general costs and benefits gained though standardization effort related with each other. In this section the reasons for possible development of these curves will be further discussed. Partially, we'll have to reference parts of what has already been written in this paper on account of what factors affect process standardization since, as in other complex human system, everything affects to some extent everything else.

### **7.1 Character of the curve**

For the depiction of the progress of the "Total benefit curve" in figure 1. a curve of logistical function has been used, since the development of values in complex systems often follow the logistical trend. In general, the curve can be split into three distinctive phases:

- Here, every additional increase in the level of granularity of process specification increases not only the value of the function but also in this part, by continually increasing the level of granularity of process description, the measure increase of the value of the function is increasing as well. This results in the acceleration of the function.
- This (middle) phase consists of the point where the development of the measure increase of the "Total benefit curve" shifts from increasing to decreasing and it also include certain interval around this point where the function appears relatively linear.
- The last phase is the opposite of the first. By further increasing the level of granularity of process specification the measure increase of the value of the function decreases continually. This consequently results in reaching the peak point, representing the maximum to which the function is limited

In certain cases the development of this function can even continue after the 3rd phase and be in fact decreasing. In the following sections we'll will deal with factors which affect the slope and displacement of the curve and also affect proportions between it's distinctive phases.

### **7.2 Deterministic nature of business process**

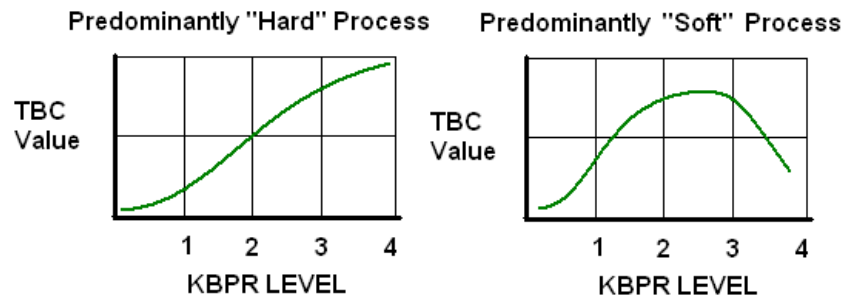
As categorized by Checkland [CHECKLAND, 1981], systems are distinguished on "hard" and "soft", according to whether they are deterministic or not. These two types in fact present only the borderline points between which real system are being situated. From the human point real system are perceived and hard or soft on the basis of which characteristics prevail (hard or soft). Since design of business processes (as it's being currently understood ) is in fact an application of classical engineering on human organizations, the highest benefits, that these methods could yield, will occur when the business process bears mostly the traits of a hard system. In the opposite case, when it the traits of a given process prevail characteristics typical for soft systems, applications of these methods will bear worse outcomes, when compared to the previous case.

In order to provide an example, a processes with a relatively "hard" character would in most cases processes of industrial production (especially assembly link), where steps of the processes have to be

done in an exact order and in an exact way, over and over, in order to produce a defined product (engine, car, computer, etc.). Any deviations in the process could, in this context, lead into creating a faulty product.

On the other hand a processes with relatively "soft" characteristics will be in most cases processes which produce services for customer and require close working and collaboration with customer (means also an individualized approach to each particular customer). Also strategical and decision making processes in a company can be included into this category.

Figure 3. depicts how the development of the "Total benefit curve" (TBC) is in general affected by increasing level of granularity of process specification. Levels of granularity of proces description are defined in accordance to KBPR method<sup>10</sup> [VORISEK, 2008, p. 147].



**Fig. 2: Differences in TBC development between soft and hard processes**

In case of a predominantly hard process the TBC value will increase in accordance to the increasing level of granularity of process specification and will reach it's potential maximal value around KBPR level 4. (See figure 2.) In the other hand for a predominantly soft process achieving KBPR level 1 or 2 will be in most cases beneficial because it'll help to establish a general framework for the process execution. Continuing at levels 3 or even 4 could, however, render the process too inflexible and reduce it's capabilities to tackle with ill-defined situation and inputs. In the context of TBC in figure 1. this would cause either shifting of the whole curve from left to right or vice-versa, or stretching/compressing it .

### 7.3 Other influences

In this section we'll summarize other factors which affect to some extent the TBC:

- Security - from my own experience, in certain types of processes (usually those where process performers manipulate with money and other valuables), a great deal of attention is paid to making the process fraud-proof. This is done (among other things) by specifying very precisely the details of the process execution and carefully monitoring it in order, not to give employees a chance to deviate from the prescribed pattern
- National specifics - encompass factors like attitudes towards orders, discipline and so on. A commonly given example is the stereotype of German environment, usually regarded as orderly and punctual, contrasted with the situation in Italy (southern states in general), which is regarded to be based more on improvisation and lack of punctuality. These aspects can consequently affect the overall effect of process standardization.
- Others - often influences like interpersonal relationships in a particular company, it's history, an so on are grouped under the term company's culture. These factor can consequently also affect the position of TBC curve. However since the company culture itself is usually understood in vague terms, it's impacts can be determined only in a superficial way.

10 Levels of granularity according to KBPR : **Level1 defines:** goals, activation event, process owner, customer of the process, qualitative and quantitative metrics, constraints, **Level2 defines:** L1 + process output, **Level3 defines:** L2 + list of activities, org. roles, all external inputs, list of feasible IS/ICT tools, **Level4 defines:** L3+ order of activities, inputs and outputs of each activity, linking of org. roles to activities, time granted for each activity, costs of each activity



7.4 Position of TBC and TCC

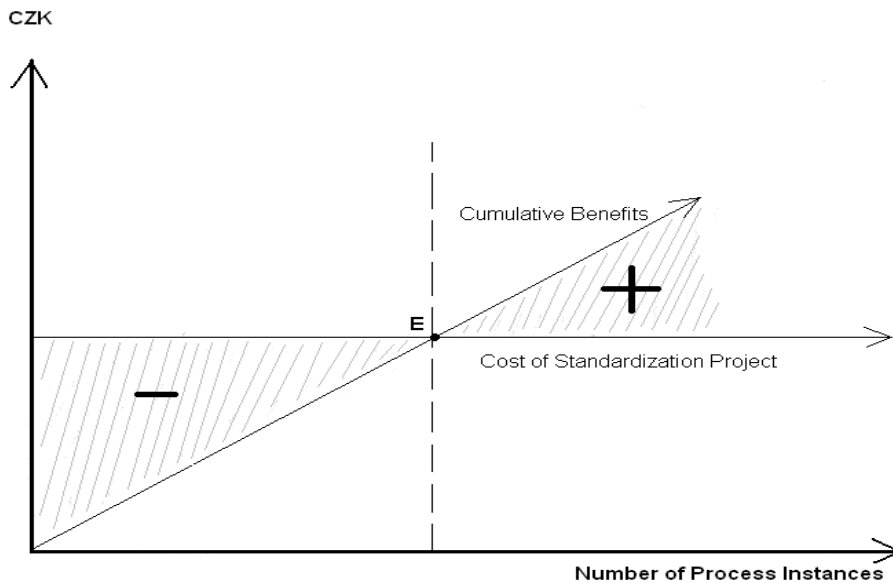


Fig. 3: Cumulation of per-instance benefits

Figure 3. provides a complementary point of view of what has been discussed in the context of figure 1. If we assume that a certain level of process definition has been achieved during a standalone project, then the costs of this project has to be paid by either increased production of the affected process or by increased effectivity of resources employed in this process. This extra income or cost savings represent together benefits gained from the implementation project which has to, in a defined time frame, cover the expenses associated with executing this project. Since the cost of the project is taken as given, it's depicted in figure 3 as being independent on the overall number of ongoing process instances.

- Slope of “Cumulative benefits” function is dependent on per single instance gain of the given business process
- The position in on the “Cumulative benefits” line plot is then affected by the number of instances of a given process

The total benefits gained from the project are directly dependent on the number of consequent instances of the affected process, e.g. how often is the process being executed. We see from the progress of “Cumulative benefits” that after reaching the point E (equilibrium), where the expenses associated with the project are paid of, that any other realized process instances are providing the organization with net benefit. The slope of the function of cumulative benefits is depended on the amount which is saved/gained from performing one single instance of the process. These gains/savings are then linearly cumulated by performing additional instances of a given process. The fundamental conclusion here is, that even if the initial costs are high (expenses related to the project) and the per-instance gain/saving is relatively low, then if the process has a mass character, these can be, in the end, paid of, thus making the whole effort profitable

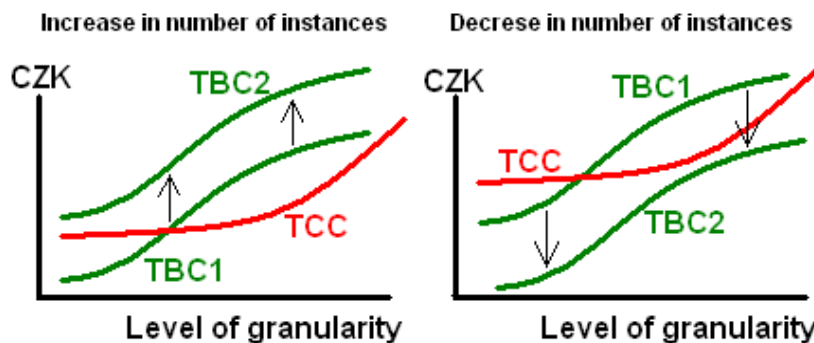


Fig. 4: Shift of TBC position

Figure 4. depicts how can an increase or decrease in the number of process instances affect the position TBC. It can in certain situation even eliminate (or strongly marginalize) the role of TCC (first example). On the other hand if the number of process instances decreases under a certain value the TCC can represent a serious obstacle (if not even grave one).

## 8. Human aspects

Standardization of company's process has an impact of the performers of these processes because it defines the rules to which they have to abide when in their employment (of course with the premise that these rules are enforced) and as such it can act in several different ways:

- **Constraining** - increased level of process standardization which defines the routines of how work should be done, constrains the independence of individual performers. It's purely on the character of the process, e.g. the character of situations with which process performers have to deal with, to determine whether the process specification isn't acting as an obstacle preventing the process to perform better, by demanding the performers to focus on what is prescribed and inhibits partially individual initiative and independent action event if such an action is beneficial for the overall performance of the process [HAMMER, 1993]. On the other hand in case of poorly qualified work performers, giving them a higher degree of freedom of acting, the outcomes may not be satisfactory as well.
- **Learning** - By the act of specifying processes, the internal knowledge of process designers of such a process is made available to others due to the process of knowledge externalizing (e.g. process specification). The benefit of externalizing the internal knowledge of employees is that the company is enabled to keep behaving in a stable way even if particular employees leave their positions in the company (e.g. improved replaceability). New employees fall then into a pre-defined position which is associated with a set of already defined and documented processes to which the new person has to adapt. Externalizing of company's employees inner knowledge improves the company's long term survivability [HANNAN, FREEMAN, 1984].
- **Motivation** - process specification bears also set of metrics which measure how well is the process performing. Also in case that employee's salary is related to the fulfillment of a set of defined metric an employee is directly motivated to act in order to his personal metrics have such a value, to affect his salary in a positive way. Employee will adapt his behavior to maximize it's benefits (according to the related reward system) regardless if this behavior contributes or not to the overall process performance [HAMMER, 2007].
- **Aversion against change** - most of the publications which tackle with problem of implementing changes into organizations stress the fact that people in organization are more or less averse against changes into routines to which they got used to. Implementing a processes according selected standards is indisputably such a case and represents then a potential source or resistance of affected people in organization (aversion against change has been discussed in the context business process reengineering [HAMMER, 1993] or in the context of company adaptation in general [HANNAN, FREEMAN, 1984]).

## 9. Regulatory compliance

One of the reasons why companies tend to bend their processes according various standards results also from cases when compliance to particular standards is required by a third party as a prerequisite for them to deal with the company in a favorable way or is directly demanded by a public authority (as for example explicitly stated in the introduction to the COBIT 4.1 framework [COBIT, 2007]). The notion taken here is slightly different from the classical distinction of de jure and de facto standards.

- **Direct** - by direct regulatory compliance we understand that a compliance to a certain standard is explicitly state as a condition for the compliant to be able to interact with the compliance demanding subject. These compliance demands can be issued by a regulatory authority as a general requirement for a certain kind of companies (then it's really a "de jure" standard) or compliance to a specified standard is demanded as a one of contractual conditions when two parties enter into a contractual relationship (these have but not always "de jure" character).
- **Indirect** - companies can decide to abide to a certain standards also out of their own will, especially when they think adopting certain standards will improve their performance. Being compliant to a well-accepted standard may give the company a slight competitive advantage in the terms of improving company's image by their business partners.

Also from the perspective of figure 1, by including regulatory authorities in the whole calculation, we may come to two situations. At first the regulatory authority<sup>11</sup> may demand from organization to abide to a certain standard where the level of required detailedness of specification of affected processes is lower than the level of equilibrium. This situation is favorable for the affected organization because in case it's required to increase the level of specification of it's processes to required level, benefits will prevail over cost in this situation. On the other hand, demanding a level of detailedness which is over the point of equilibrium is in fact harmful for the company and may lead to several outcomes, like withdrawing from the regulated segment or loosing competitiveness.

## 10. Outcomes for small IS/ICT organization

Given the usual characteristics of small organizations and the nature of the above mentioned factors affecting/affected by process standardization, the outcomes for small organizations include the following.

As mentioned in the characteristics of small business organizations, they do not usually participate in a mass production like activities, so the cost of defining and specifying processes according to selected standards will have to be spread among a lower amount of production, then in a case of large company. This also means that in case that the organizations doesn't have it's own expert in the field, it will probably need to contract one in order to be able to successfully cope with the standardization effort. This all together may embody a cost obstacle which in certain case may prove to be too big, meaning that the costs of standardization effort may outweigh perceived benefits and thus either effectively inhibit potential project or be a source of disappointment in the end.

Since we've argued that usually processes in small organizations doesn't have a character of mass production and are more likely to be dealing with a less unified inputs and outputs, thus covering all eventualities by the process specification may become rather unproductive effort. Having rather generally specified guidelines and keeping a specific approach to each of the instances of the process may be possible due to low number of process instances (enabling the management of these processes to be mentally comprehensible) and at the same time the process will not be constrained by process specification, forcing performers to forceful bend the instance to the unified procedure.

As mentioned above small organizations tend to be rather informally structured, so effort consisting of implementing standardized process represent probably the biggest cultural shock such a company may suffer. Implementing standard procedures and formalization of roles in the company goes strictly against a informal notion of a company's current culture.

## 11. Are best practices really the best?

In a set of articles Phil Rosenzweig [ROSENZWIEG, 2007a-b] has taken a rather critical point of view of several well regarded methodologies and management guidelines. Rosenzweig points out that many of so-called best practices are based on biased assumptions. Absolute improvement isn't in fact relevant, the crucial factor is the relative improvement in the context of company's competitors, thus following a certain set of standards as a strategy of winning is flawed because basically each of company's competitors can follow them as well, after all these are frequently being sold as a commodity (Davenport focuses in one of his books explicitly on this problem [DAVENPORT, PRUSAK, 2003]). On the contrary, the turning points in company's well being are strategic decision which incorporate in itself also the undertaking of entrepreneurial risk of failure (and luck from time to time as well), which is a situation no standard can help.

Christensen [CHRISTENSEN, 1997] take s a step even feather and argues that it's in fact the following of widely accepted managerial standards resulted in decline in case of majority of IS/ICT companies about which he has been able to gather data. Basically pursuing the maximum benefit for the company's stakeholder (increasing customer value, high return of investments, listening to entrepreneurial partners, risk awareness, etc.)<sup>12</sup> has made then unable to undertake a strategically

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11 Public authority may for example demand from organization to achieve a certain level of detailedness of process specification and related level of maturity in order for such a company to be eligible for receiving governmental contract's. This is for example a situation in United States and CMMI [CMMI, 2002], when it comes to contract's regarding delivery of information technology and systems. On the other hand a private authority may be for example mother company imposing it's global-wide standards to companies it owns.

12 Christensen demonstrates his arguments on the example of development of IT industry, especially on examples of formerly successful computer manufacturers. In most cases each of the leading companies, at the given time, has missed the emergence of a new technological innovation, which later shifted computer

decision when the opportunity was around which resulted in most cases to either drive them out of business or losing the position of market leader after certain period of time.

Of course standards and best practices an important role as well, they can for some time supplement the gap in the level of knowledge of company's management and can act as an learning material, and implementing it can lead to improvement of business process performance, but in order to achieve a long time growth the company needs to develop their own distinguished way what'll, or will not, give the company a competitive advantage, also there is no failure-prove cookbook which will assure success of a company, for an inherent part of entrepreneurship is undertaking entrepreneurial risk.

As also pointed in [VORISEK, 2008, p. 72] "...the solution of IS/ICT is in each enterprise unique, so CIO and his team should be able to find such a solution, which is for particular enterprise in given conditions optimal". With the respect to what I've already written in the three preceding paragraphs, I say that this is valid not only in the context of IS/ICT alone, but also in the context of the company as a whole.

## 12. Conclusions and recommendations

In this paper we've pointed out and argued several issues which represent a success factors for implementation of standard processes into companies, and especially to those belonging to the SME segment:

- extensive standardization may not pay off in the context of SME, based on the comparison of standardization cost and per process-instance cost reduction
- standardization may undermine the company's ability to quickly adapt of the shifting environment which it's part of currently popular best practices may suffer from superficial understanding of company's success drivers
- given the multi-dimensional character of company's business and IS/ICT processes there is always a risk that over-emphasizing or neglecting certain dimensions over other ones may limit total process performance, even to such an extent that certain performance drivers may act against other driver and thus negate or lower their impact
- particular process frameworks may represent a good learning material in case of insufficiently experienced management
- process specification may partially supplement inadequately qualification of performers
- may leverage process performance and reduce cost in case certain requirements are met.

As pointed during the explanation of figures 1 and 2, rationally behaving organization should strive to implement those parts of a selected standard which yield the best ratio between costs and benefits. It has fundamentally two reasons, small organizations have more limited budget to their disposal and it's to be expected that number of process instances would be also relatively small when compared to larger organizations in the same segment of industry. This means that implementing certain parts of selected standard may be either unaffordable due to the initial costs of implementation project or event when implemented, such an investment would pay relevant amount of time due to insufficient amount of instances of the selected process. The recommendation here is then to carefully and critically select only the most beneficial parts of the selected standard (this includes also potential modification of these parts) and to provide adequately rigorous business case in order to support the decision making process in the organization. A well defined business case, which would transparently show the overall benefits of implementing of selected changes would provide also a good basis to tackle potential aversion towards changes from process performers.

Also even that I've introduced, in figure 1, the point of equilibrium, reaching this point may not be always in the global interest of a particular organization. The model doesn't take into account the so-called "opportunity costs", which means that although the net benefit of moving closer to the point of equilibrium is still in positive numbers, investing resources of organization into other projects may yield higher gains relatively to the invested resources, meaning that in case that the organization would strive to get closer to the point of equilibrium, it wouldn't act optimally in the economic sense, because other opportunities would yield more, meaning that the company would be losing when compared to the potential optimal portfolio of projects.

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markets in such a way that drove them out of business or caused them to significantly loose on importance. Usually these new innovations were deemed as risky, unprofitable, not interesting for the current set of their customers or business partners. Which is, what is in fact prescribed by managerial handbooks as crucial factors of successful and responsible management.

Compliance to selected standards may be a must in order to do business in certain areas which are a subject of regulation from a regulatory authority, but a sole compliance to the standard is nothing more than a necessary condition, not a guarantee of success in the context of other competitors.

### 13. Open questions and further work

Here I present several non-answered questions which are not covered in this paper but maybe of a general interest of certain readers and a potential area of focus of mine:

- According to a separation of business into aggregated sectors of economy a question arises, whether there exists an correlation (positive or negative) between the relative amount of IS/ICT related expenditures in businesses in particular sector and perceptual ratio of small businesses in it (either as a number of small businesses compared to the overall number of businesses in this sector or as a ratio of overall financial output of small businesses to the output of the particular sector of economy as whole).
- We've mentioned that small business incline (due to reasons defined above) to have their processes defined to lower level of granularity when compared to large enterprises and that low level of definition is usually compensated with higher qualification of process performers. The implication is then the following: Do small businesses tend to employ more qualified people (like ratio on the overall number of employees) than larger businesses? Verification of this implication is not covered in this paper, due to limited volume of this paper, but it definitely could provide a full-fledged research topic on it's own.
- In order to determine more precisely the tendencies in the development of shape of curves in figure 1. typical for particular categories of processes and in order to be able to recommend particular levels of granularity of process specification a rigorous observation and collection of data would be necessary.

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