



# BALANCED SCORECARD

## MEASURING CM PERFORMANCE

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## ABSTRACT

This document gives an overview of the utilisation of the 'balanced scorecard' as performance measurement tool for cluster management. Furthermore, it subsumes the results of the test carried out in cooperation with the IT Cluster in Moravia-Silesian region.

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## 1 INTRODUCTION

“People and their managers are working so hard to be sure **things are done right**, that they hardly have time to decide if they are **doing the right things**.”

(Stephen R. Covey)

During the last years the cluster approach has evolved into an important instrument in regional development. A broad variety of cluster programmes and initiatives have been launched across Europe and clusters as well as cluster management are leaving the experimental stage towards professionalisation. Currently the professionalisation of cluster management is one of the hottest issues in the regions, especially as it concerns evolving clusters.

Due to the growing competitive pressure on regions cluster managers have become aware that it is not just the cluster, but also the management which needs further development. Against this background cluster management needs to be both strategically and operationally excellent to meet tomorrow's challenges. Referring to the above citation, doing the right things and doing the things right is a balancing act, and requires a good strategy and efficient operations.

In many regions formal cluster management structures have been established in recent years. But although financial and human resources for cluster management are often limited and therefore, should be used most beneficial, related strategic objectives for the management have not been defined or are not being monitored adequately. When it comes to legitimating of cluster management both, internally as well as externally (e.g. policy level) this can prove to be a major problem.

It is generally agreed that businesses perform better if they are managed through formalised, balanced and integrated performance measures. In general it is to be expected that this also applies to non-profit organisations like cluster management organisations. As the NICE project consortium has discussed at its first cluster management workshop the development of a cluster management toolbox is useful to support the process of defining such strategies and to achieve the balance between strategy and operations. A first action has been taken with testing the applicability of the Balance Scorecard model for the IT Cluster in Moravian-Silesian region.

In the following chapter the scorecard model is introduced, and its ideal design and implementation process are outlined. The process and outcomes of testing the instrument's usability for the IT Cluster in Moravian-Silesian region are described subsequently.

## 2 BALANCED SCORECARD

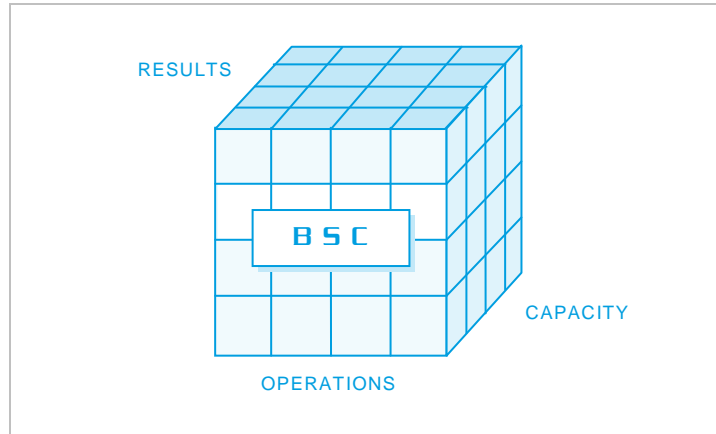
Since the appearance of the Balanced Scorecard (BSC) model in 1992, it has gained widespread acceptance as a mutual tool for performance measurement and strategic management (Yee-Chin 2004). It has originally been introduced by Robert S. Kaplan and David Norton as a tool for measure non-financial performance of commercial organisations. BSC is briefly defined as a management framework that ‘... translates an organisation’s mission and strategy into a comprehensive set of performance measures that provides the framework for a strategic measurement and management system’ (Kaplan & Norton 1996: 2). It provides feedback related to internal business processes and external outcomes in order to continuously improve strategic performance and results. Insofar, it goes beyond a pure performance measurement system and is more likely to be defined as a performance management system. Following Kaplan and Norton, the BSC model was developed to measure both current operating performance and the drivers of future performance, as-is and to-be analysis (Kaplan & Norton 1996).

### 2.1 THE BSC CONCEPT

With its approach the BSC model addresses likewise the strategy development process and the continuing monitoring strategy achievement and performance measurement. A fully deployed BSC seeks to ensure that the drivers of long-term performance ‘breakthrough’ are identified and aligned with customer requirements and day-to-day work. In practice this means that an organisation’s mission and strategy is linked to action, which results in positive tangible operational outcomes. A BSC system can be applied in any size of company to manage and evaluate business strategy, monitor operation efficiency, and communicate related processes to all employees (Rohm 2006). As is shown in Figure 1, it enables organisations to measure financial and customer results, operations, and organisation capacity, and thus provides the possibility to view three different dimensions of organisational performance.

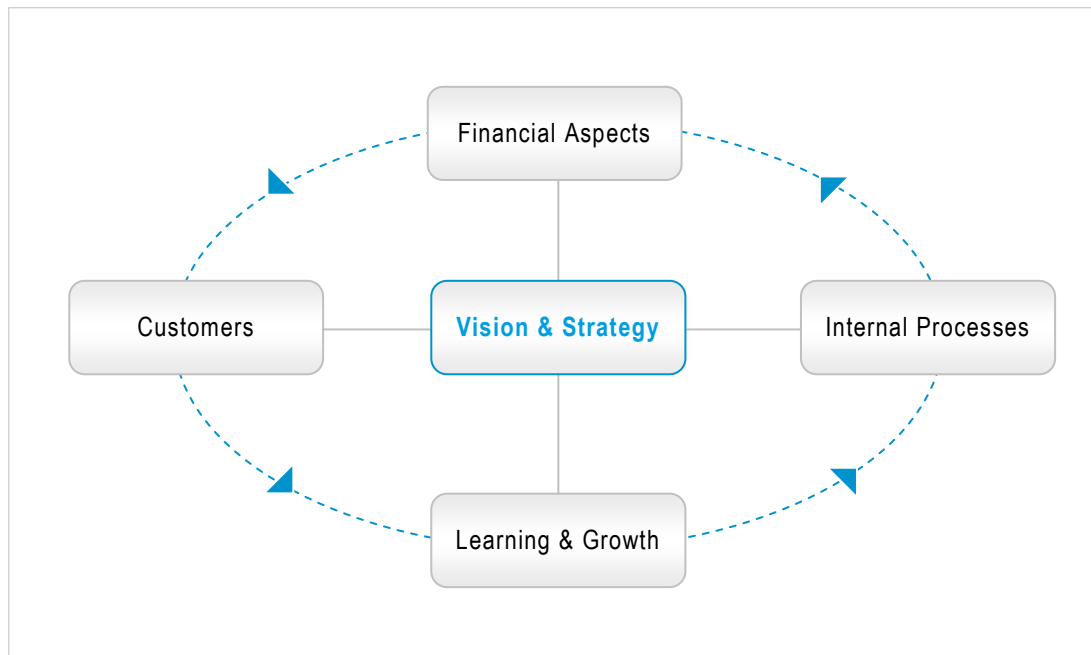
The BSC system comprises the following elements: (1) Business Foundations, including vision, mission and values; (2) Plans, including communications, implementation, automation, and evaluation plans; (3) Business Strategies and Strategic Maps, to illustrate the course and define the decomposition of strategies into day-to-day activities; (4) Performance Measures, to observe the actual performance against expectations; (5) Business and Support Unit Scorecards, to translate the corporate vision into tasks for departments; and (6) Leadership and Individual Development, to ensure that employees’ knowledge, skills and abilities are be continuously enhanced to meet future job requirements.

Figure 1: BSC Dimensions



Following the BSC logic, vision, mission and strategy at the corporate level are decomposed from four different inter-related perspectives: business owners, customers and other stakeholders, managers and process owners, and employees. The FINANCIAL PERSPECTIVE represents the business owners, the CUSTOMER PERSPECTIVE customers and other stakeholders, managers and process owners are presented by the INTERNAL BUSINESS PROCESSES PERSPECTIVE, and finally, the LEARNING & GROWTH PERSPECTIVE stands for employees and infrastructure, also referred to as capacity. Figure 2 shows the relationship between these key elements.

Figure 2: Basic Design of a BSC System



In contrast to profit-driven private companies public or non-profit organisations are mainly mission-oriented. Accordingly, the desired outcome for a private organisation is a growing, profitable, competitive enterprise, whereas it is for a non-profit organisation the delivery of necessary, cost-efficient services for its members. Nevertheless, BSC can assist managers of non-profit

organisations accomplishing the same strategic planning and control functions as is the case for managers of profit-driven organisations (Yeen-Chi 2004):

- Clarifying and gaining consensus about strategy;
- Communicating strategy within the organisation;
- Linking strategic objectives to long-term targets and annual budgets;
- Identifying and aligning strategic initiatives;
- Performing periodic and systematic strategic reviews;
- Obtaining feedback to learn and improve strategy.

In order to accomplish these functions the traditional BSC needs – as is illustrated in Figure 3 – some major adjustments before being applied to non-profit organisations. Since the mission is the key driver for non-profit organisation, it becomes a core element of the scorecard system. Further modifications concern the perspectives: Firstly, the CUSTOMER PERSPECTIVE is changed to **CUSTOMER & STAKEHOLDER PERSPECTIVE**, because their mission and corresponding activities are not only related to the customers but also in case of cluster management organisations to policies and the region as whole. In other words the stakeholder perspective is added to keep the complexity in account. In the following the enlarged perspective is also referred to as **COMMUNITY PERSPECTIVE**. Secondly Financial and Community Perspectives change their position. This is done to elevate the role of the Community Perspective and to reduce the influence of financial indicators. To reflect '[...] the importance of the human system and of capacity building through trained and knowledgeable employees and efficient information technology systems' (Rohm 2006: 3) instead of INTERNAL PROCESSES the term **EMPLOYEES & ORGANISATIONAL CAPACITY** is used. 'Strategy is the approach to accomplish the mission and to implement an organisation's vision' (Rohm 2006: 3).

Figure 3: Basic Design of a Non-profit Organisation BSC

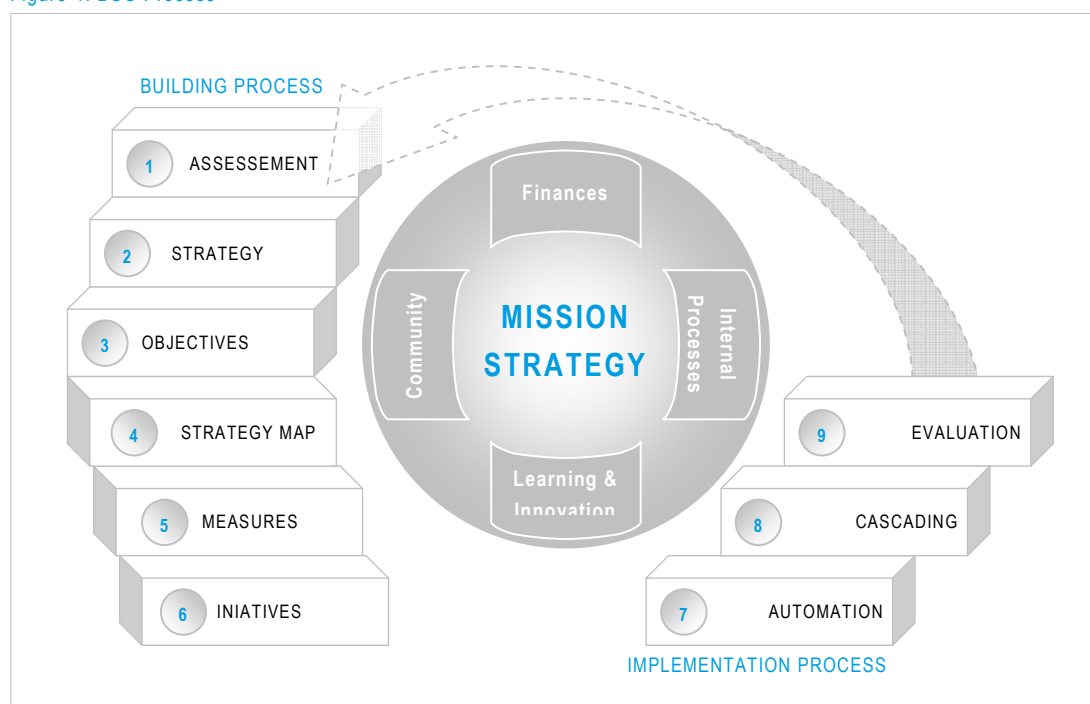


According to FLAK and DERTZ (2005) the so revised BSC is among others said to be useful in the management of non-profit organisations in:

- Bridging the gap between indistinct mission and strategy statements with day-to-day operational measures;
- Facilitating a process by which an organisation can achieve strategic focus;
- Shifting an organisations focus towards the supposed outcomes of programmes and initiatives rather than to programmes and initiatives themselves.

Rather than as project the development of a BSC is to be seen as a process (see Figure 4). Even though discreet start and stop points exist in the process, one should note that the real value of a scorecard system arises from continuous self-inquiry and in-depth analysis. Thus, BSC is a long-term process in which changing behaviour is as important as measuring performance.

Figure 4: BSC Process



## 2.2 DESIGNING & IMPLEMENTING A BSC SYSTEM

Basically the development of a BSC system can be divided into two main phase: Firstly, the creation of the components of the scorecard and secondly, its implementation. As is shown in Figure 4, a six step process can be used to build the BSC (Rohm 2006). This initial phase results in a high-value scorecard which functions a basis for the subsequent implementation phase of three steps. Both phases are being described in the following chapters.



## 2.2.1 Phase I: Designing a BSC

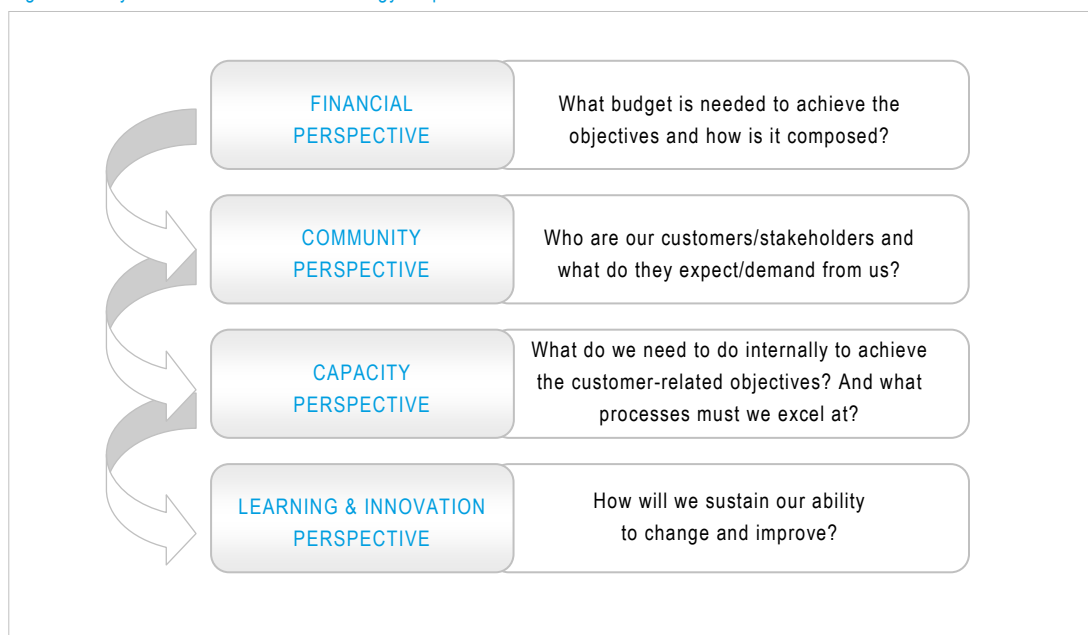
Before starting to design a BSC the organisations' **MISSION** should be clear, particularly with regard to non-profit organisation. Beginning with a self-assessment of the organisation's foundations, its core beliefs, etc. in order to identify an organisation's strengths, weaknesses, opportunities and threats lays the ground for the complete process (STEP 1). A sound mission is brief, memorable and pragmatic, as well as inspiring. It serves to focus employees on the highest objectives of the company, and thus becomes a cornerstone of corporate strategy.

STEP 2 is the development of an overall **STRATEGY** which might include for a non-profit or governmental organisation strategic themes like 'build a strong community', 'improve education', and 'foster cooperation'.

After the strategy has been defined it is decomposed into so-called **OBJECTIVES** (STEP 3). These are the building blocks, the components or activities which make up the whole strategy.

In STEP 4, a **STRATEGY MAP** of the organisation's overall strategy is created. The STRATEGY MAP is a visual representation of cause-and-effect-relationships among the key components (objectives) of an organization's strategy (Kaplan & Norton 2004). It translates the strategy into a series of interconnected objectives that weave through the four perspectives of the scorecard. To design it one needs to answer a series of key questions in cascading as shown in the figure below.

Figure 5: Key Questions to build a Strategy Map



Inspired by the mission, for each of the four dimensions objectives are to be defined. Concerning the **COMMUNITY PERSPECTIVE**, the objectives represent the value proposition to the community the

organisation serves. These are desired outcomes. Being able to define these objects requires the definition of and clarification about the stakeholders.

### Excursus: Stakeholder Analysis

According to the Stanford Research Institute stakeholders are '*... those groups without whose support the organization would cease to exist.*' Following Freeman's strategic management oriented definition, a stakeholder is '*... any group or individual who can affect or is affected by the organization's objectives*'.

A Stakeholder Analysis is a technique to identify and assess the importance of key people, groups of people, or institutions that may significantly influence the success of organisations activities or projects. In general it comprises three major steps:

1. Identification of stakeholders, their representatives and opinion formers (e.g. through brainstorming).
2. Stakeholders prioritization – analysis of stakeholders' perception and potential consequences, of the attitude to the other stakeholders, a picture of who has actual power and influence, and a picture of stakeholders' expectations with respect to influence (e.g. mapping in power/interest grid)

Figure 6: Interest / Power Grid for Stakeholder Prioritization



3. Understanding the key stakeholders, some key questions: What financial or emotional interests do they have in the outcomes of your work? What motivates them to participate in cluster activities? What communication channels are appropriate?

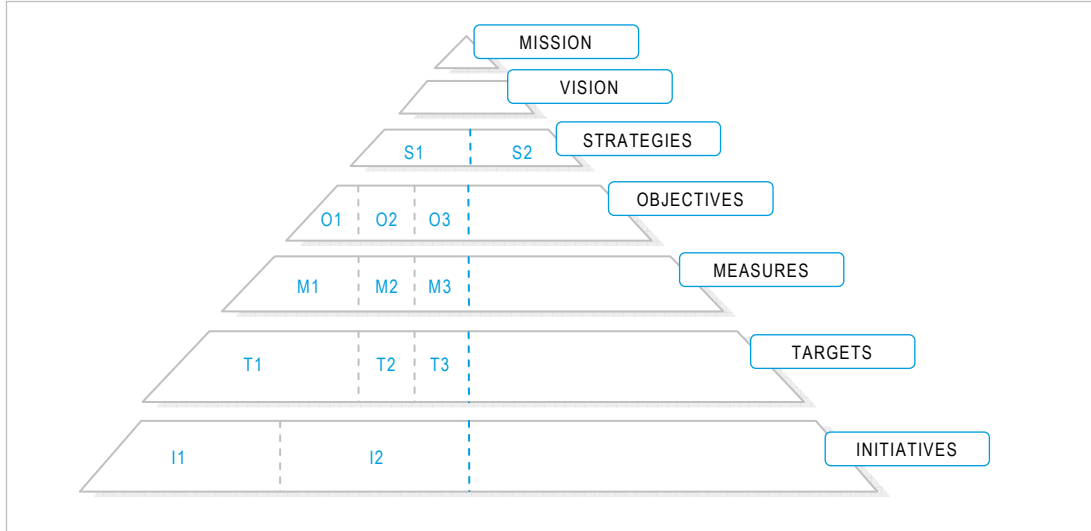
Once the objectives for this perspective have been defined, one can move on to the CAPACITY PERSPECTIVE and identify what are the processes one must excel at in order to achieve the desired outcomes for the community. '*Value for the community is created through internal processes*

(Kaplan, Norton 2004) that ensure organizations will deliver what they promise.’ (Bocci 2005: 10). Next the objectives for the FINANCIAL PERSPECTIVE are to be defined. Contrary to profit-driven organisations, in which defining outcomes like profitability is of high interest, for non-profit organisations financial resources ‘[...] can be seen as either enablers of organization’s success or constraints with which the organization must operate.’ (Bocci 2005: 11). Thus, the financial perspective is for non-profit organisations rather an input than an output perspective, which for example includes objectives related to funding and resources planning, allocation and distribution. Like the latter, the LEARNING & INNOVATION PERSPECTIVE is an input perspective. It represents the intangible foundation of the organisation. According to KAPLAN and NORTON, in this perspective one needs to take into account objectives and indicators the three components human, information and organisational capital (Kaplan & Norton 2004). Recapitulating, the major benefit of strategy maps lies in its potential for clarifying, describing, and aligning highly individualized corporate, business unit and functional strategies. Well designed strategy maps highlight the few key strategic goals management attention and resources have to be focused on in order to manage strategic change or to keep on track in an increasingly competitive environment.

Next PERFORMANCE MEASURES are to be developed to track both, strategic and operational progress (STEP 5). In order to be able to define meaningful performance measures, one needs to understand the desired outcomes and the processes that lead to those outcomes. While desired outcomes are measured from the perspective of the community, capacities are measured from the perspective of the process owner and the activities needed to meet the communities’ requirements. Basis for the development of these measures is the Strategic Map. For each objective performance measures need to be developed. This includes the development of the measure itself (metrics) and the expected levels of performance (targets). In order to identify the measures that matter most (key performance drivers) one can utilise three models: Firstly, the *Logic Model* with which one can explore the relationship among four types of performance measures: inputs, processes, outputs and outcomes. One starts with the definition of the outcomes and works backwards the processes that produce the outcome. Secondly, the *Process Flow* to identify activities and measures that matter most to produce good outcomes, and thirdly the *Causal Analysis* which identifies the causes and effects of good performance. Here one starts with the result (the effect) one aims to achieve and then identifies all causes that contribute to the desired result.

The final sixth step is to identify new (strategic) INITIATIVES which need to be implemented and might possibly need to be funded to ensure the defined strategies success. These initiatives are to be understood as specific projects, outside the common activities of the organisation, that are undertaken particularly to help accomplish the strategy or to close the gap between a measure and its targets. In general initiatives have a fixed start and end dates and are focused on compassing something that will support the accomplishment of the particular strategic objective (Barberg 2006a). When defining initiatives one needs to keep in mind that if too many operational tasks are treated as initiatives, the clutter might confuse the focus on the critical strategic initiatives. To summarise, in designing a BSC system, an organisation must measure the critical few parameters that represent its strategy for long-term value creation (Norton & Kaplan 2004). Putting it all together the BSC design process is structured as shown in the following figure:

Figure 7: Design of a BSC



In order to link the components of the scorecard, one can use the following view:

Figure 8: Linking BSC Components

	OBJECTIVE	MEASURE	TARGET	INITIATIVES
FINANCIAL				
COMMUNITY	ICT Specialist Growth	<ul style="list-style-type: none"> <li>▪ Graduates</li> <li>▪ Teacher</li> <li>▪ Marketing</li> </ul>	<ul style="list-style-type: none"> <li>▪ 1.000/year</li> <li>▪ 100</li> <li>▪ X visits in secondary schools in the region</li> </ul>	<ul style="list-style-type: none"> <li>▪ Development of an apprenticeship system</li> </ul>
CAPACITY				
L&I				

## 2.2.2 Phase 2: Implementing a BSC

According to ROHM and HALBACH (2006) the second phase can basically be broken down into three steps: Automation, Cascading and Evaluation (see Figure 4). Each step's output is linked to the input of the subsequent step.

**AUTOMATION** (STEP 7) refers to the deployment of a technology base for the BSC. Due to the fact that a huge volume of information needs to be managed, many organisations accelerate the benefits from their BSC by using enabling technology to facilitate the BSC management process (Miyake 2002). In order to capture the BSC management system's full potential, the enabling technology should support the requirements of the desired management process. If the application does not, the resulting process will be sub-optimal. But, when to implement BSC software is almost as important as the decision to automate the BSC: Implementing software too early might limit creative strategic thinking due to the solutions logic, *'[...] and purchasing it late makes it difficult to sustain momentum for the new BSC, as performance information reporting and utilization is clearly an early benefit to be captured from the process of building the scorecard system.'* (Rohm & Halbach 2006: 2). Thus, the timing affects the chances of success and, in turn, the success of the entire BSC initiative. The decision depends on many factors specific to the single organisation – most importantly, its stage in the BSC life cycle.

STEP 8 is focused on cascading the corporate scorecard throughout the organisation. Therefore, **CASCADING** involves rolling the top level strategy down to the lower levels of the organisation, such as business units, divisions, departments or individuals. Rather than just pushing the same measures defined for the top level down to other parts of the organisation, cascading *means "[...] translating the corporate scorecard into department and division scorecards that are aligned with corporate strategy [...]"* (Rohm/Halbach 2006: 2). In order to link the objectives from lower organisational parts with the higher level objectives of the corporate scorecard, one should use the same type of cause and effect thinking that is used to create the strategy map. According to Rohm and Halbach a good starting point for cascading are the objectives and measures from the organisation-wide strategy map.

The final implementation step involves evaluating the success of the chosen cluster management strategies. The key question to be answered is, have the expected results been achieved? In general adjustments to strategy are likely as performance information is analysed and competitive forces are considered. Not only against the background that results which are not used, are not taken serious **EVALUATION** is very important for the following reasons (Procurement Executives' Association 2006):

- **Gap Management.** Performance results can be used to determine gaps between strategic objectives and/or annual goals and actual achievement. Whenever such gap occurs, it is an opportunity for process improvement.

- **Enhancing strategic feedback and learning.** Kaplan and Norton recommend utilising BSC to learn about the future. During evaluation it should not only be discussed how past results have been achieved, but also whether their expectations for the future are realistic. In case an organisation followed established strategies but did not achieve its objectives, internal capabilities should be examined and the validity of underlying strategies assessed, and – if necessary – strategies be redirected. Furthermore, changes in framework conditions (e.g. new technologies, legislative initiatives etc.) may create new opportunities or threats not anticipated when the initial strategy is further developed.
- **Benchmarking.** BSC can be used, to benchmark the own organisation against other organisations, which helps to get a picture of how e.g. the cluster management performs compared to others. In addition it may serve as input for the formulation of strategic objectives. In order to make a valid comparison among others the following aspects should be taken into account when selecting the benchmark: Is the organisations size and budget similar? Does the organisation have a similar mission or does it perform work of the same complexity?
- **Cross-functional problem solving.** By illuminating links between strategies, measures and expected outcomes at different levels in organisations and across different operational components, the BSC encourages cross-functional problem solving.
- **Oversight & compliance.** Results of the BSC measures and other reports and statistics help highlighting the areas of concern. As far as BSC measures are properly aligned with strategic objectives then review efforts should be focused where they will have the most benefit, and should analyse the cause of concern and identify remedies (e.g. eliminating non value-added activities). Furthermore, BSC provides referring to cluster management a framework for reporting to the cluster members and public authorities.

### 3 THE CASE 'IT CLUSTER OSTRAVA'

Evaluation and monitoring of cluster management is an important topic to cluster managers for two reasons: First, cluster management organisations often have only limited resources, human as well as financial, and thus need to strategically allocate those to the areas of highest interest for the clusters' future development. Second, when it comes to legitimating of cluster management both, internally as well as externally (e.g. policy level) such instruments deliver a base for good argumentation.

While much has been written about cluster performance, rather little research has been done on performance measurement in cluster management so far. In the context of performance management it is quite important to distinguish between those two levels because cluster management organisations can influence their own performance directly, whereas the development of the cluster can only be supported by them and consequently, only be influenced indirectly.

As cluster management experiences in other regions across Europe have shown, it makes sense to implement strategic performance management instruments at an early stage in cluster development in order to continuously monitor the cluster management activities and their impact on the cluster's development. This was one of the main reasons for choosing IT Cluster as appropriate testbed. Rather than developing a full BSC system the aim of the 2-day workshop in Ostrava was to get an idea of the usability of BSC for performance measurement in cluster management.

In the following the process and outcomes of the conducted BSC pre-test in Ostrava are described, starting the IT Clusters organisational framework and basic conditions. In chapter 3.2 the pre-test process and its results are outlined.

#### 3.1 ORGANISATIONAL FRAMEWORK & BASIC CONDITIONS

Starting point for IT Cluster in Moravia-Silesian region was the ICT Club initiated by the dean of the Faculty of Engineering and Computer Science by inviting regional ICT companies to informal meeting to intensify transfer of knowledge between university and firms. As a result of these networking activities the decision was made to start an official cluster initiative under the framework of the 'National Cluster Strategy 2005-2008', which defines the nationwide cluster strategy. A preparatory study on the regional ICT market which covered both, demand- und supply-side, has been conducted to begin with. Eight month later, in January 2006, the cluster has officially been registered at the Ministry for Internal Affairs (Terstriep, 2006).

IT Cluster is organised as an association. Following the directives of the 'National Cluster Strategy 2005-2008' which built the framework of regional cluster activities, with its official registration IT Cluster has assigned a cluster manager responsible for the operative cluster management. He is bound to the strategic guidelines of the general assembly and reports to the supervisory board.

About 420 companies form the sector's base in the Moravia-Silesia region. Due to its embryonic stage the cluster currently is composed by approx. 20 paying members, of which 16 are companies. Additionally 3 knowledge centres, namely the Faculty of Engineering and Computer Science, the Secondary Technical School of Electronics and Informatics, and the Institute EuroSchola are members of the cluster. In the context of the preparatory study further 70 firms have been identified as potential cluster members. The typical entrepreneurial member was founded between 1990 and 1992, is in solely Czech ownership, has an annual turnover up to 1 million €, and employs up to 50 people (Břsková 2006). With a proportion of 90% SMEs dominate the cluster. Concerning business activities the focus is on Application Development.

Because of its early development stage IT Cluster lacks experience with the cluster approach which results in scepticism of companies towards the expected outcomes and benefits. At the same time the cluster's development stadium bears the chance to position a cluster brand on regional and national level.

IT Cluster is financially supported through the 'Operational Programme Industry and Enterprise' (OPIE), especially the measure 'Kluster' for three years. During this time the cluster has to proof its sustainability by developing joint projects which have to be co-financed by its members.

### 3.2 THE PROCESS

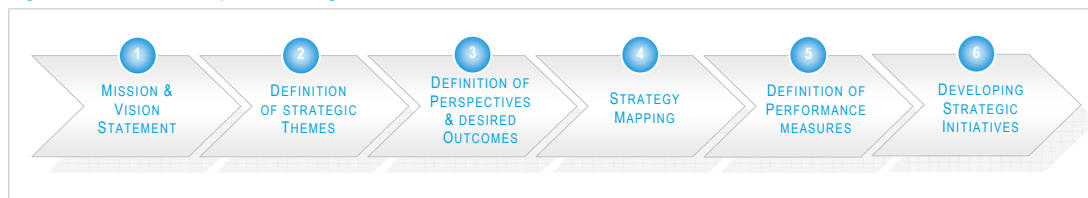
The 2-day BSC workshop took place October, 30-31, 2006 in Ostrava. Next to the regional development agency, represented by Pavla Břusková (CEO) and Zdeněk Gruszka (Project Manager), a representative from the Faculty of Electronic Engineering and Computer Sciences and five entrepreneurial cluster members participated in the workshop, which was prepared and moderated by the Institute for Work and Technology. The workshop was twofold: It started with a brief introduction of the theoretical framework of the Balanced Scorecard as performance measurement instrument in order to lay the ground for the subsequent discussion, followed by the first steps in developing a scorecard for IT Cluster.

According to the workshop's aims the following overall outcomes have been envisioned:

- BSC is not suitable for strategic orientation in cluster management.
- BSC is an interesting tool and we will continue its development by ourselves.
- BSC is so interesting that we will realise a complete BSC system in an ambitious way.



Figure 9: BSC Workshop Proceeding



The BSC process started with the consideration what the strategic business unit is, for which the scorecard is to be designed for. Because all subsequent steps in the process are based on this decision, it was worth a second thought. Due to the fact that cluster management regularly involves a range of different players, in the framework of clusters business units are not as ambiguous. Thus, it was decided to take the cluster management network as strategic unit.

As is shown in Figure 9 the first step was to define the cluster management's mission. It was discussed what the overall goal of IT Cluster – as management organisation – is (in the following the term IT Cluster refers to the cluster management). Main aspects which have been taken into consideration are the companies' growth and subsequently the growth of employment. The achievement of both requires a competitive regional advantage to stimulate business performance. This concerns likewise R&D and innovation. According to this the following mission statement has been formulated:

**Make IT Cluster a sustainable network characterised  
by self-enforcing processes and self-organisation.**

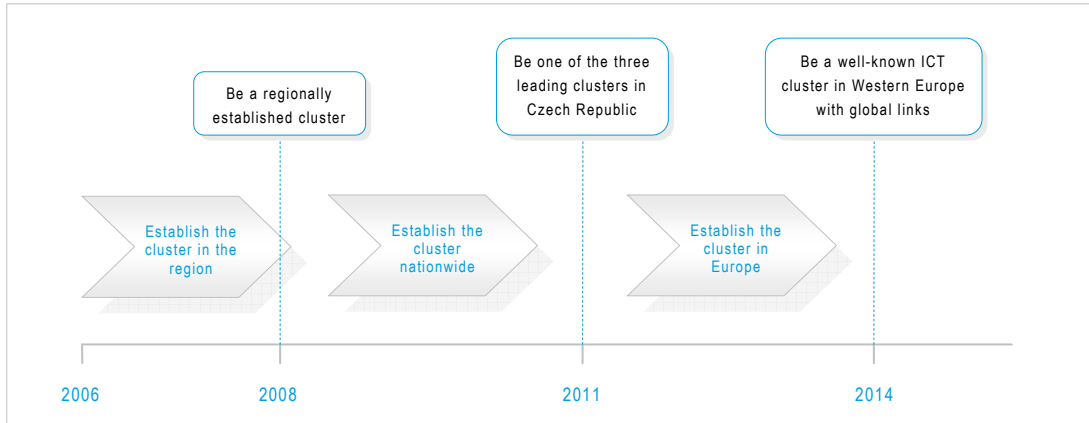
In the following it was lively discussed whether the 'old' vision statement *'[...] to reach a doubling of the number of graduates of IT in the horizon of 5 years and to build comprehensive specialist capacities [...]'* (Břusková 2006: 18) reflects the mission, or if it is too narrow. As is shown in Figure 10, the discussion brought forth a more differentiated vision which takes the stage of cluster development into account.

Based on the defined vision the following strategic themes have been identified in a brainstorming session as being relevant to achieve IT Clusters' vision:

- ICT company growth
- IT Cluster growth through support of spin-offs and start-ups
- IT Cluster growth through inward investment

It is expected that the above will lead to an improvement of the regional employment situation and thus, will contribute to a better economic performance of the region and improved living conditions.

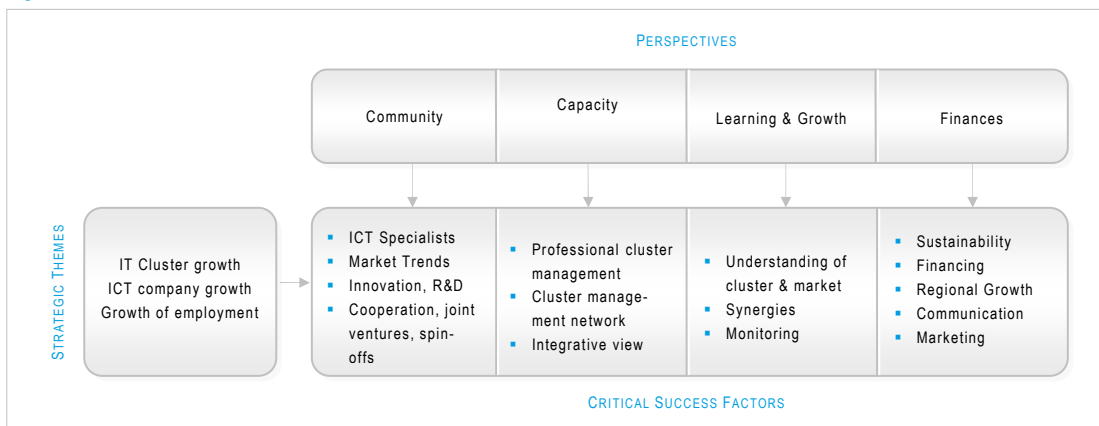
Figure 10: Vision of 'IT Cluster'



One of the key questions when defining the strategic themes was if the cluster management should in first instance support existing ICT companies rather than start-ups and spin-offs. Against the background of lacking ICT specialists in the region this has been discussed controversial. While the participating company representatives preferred employing alumni, the economic development agency pointed out its interest in the foundation of new innovative firms. The idea came up that this conflict might be solved by doing both, e.g. through support of joint ventures among existing companies and the development of a strategy for start-up/spin-off support.

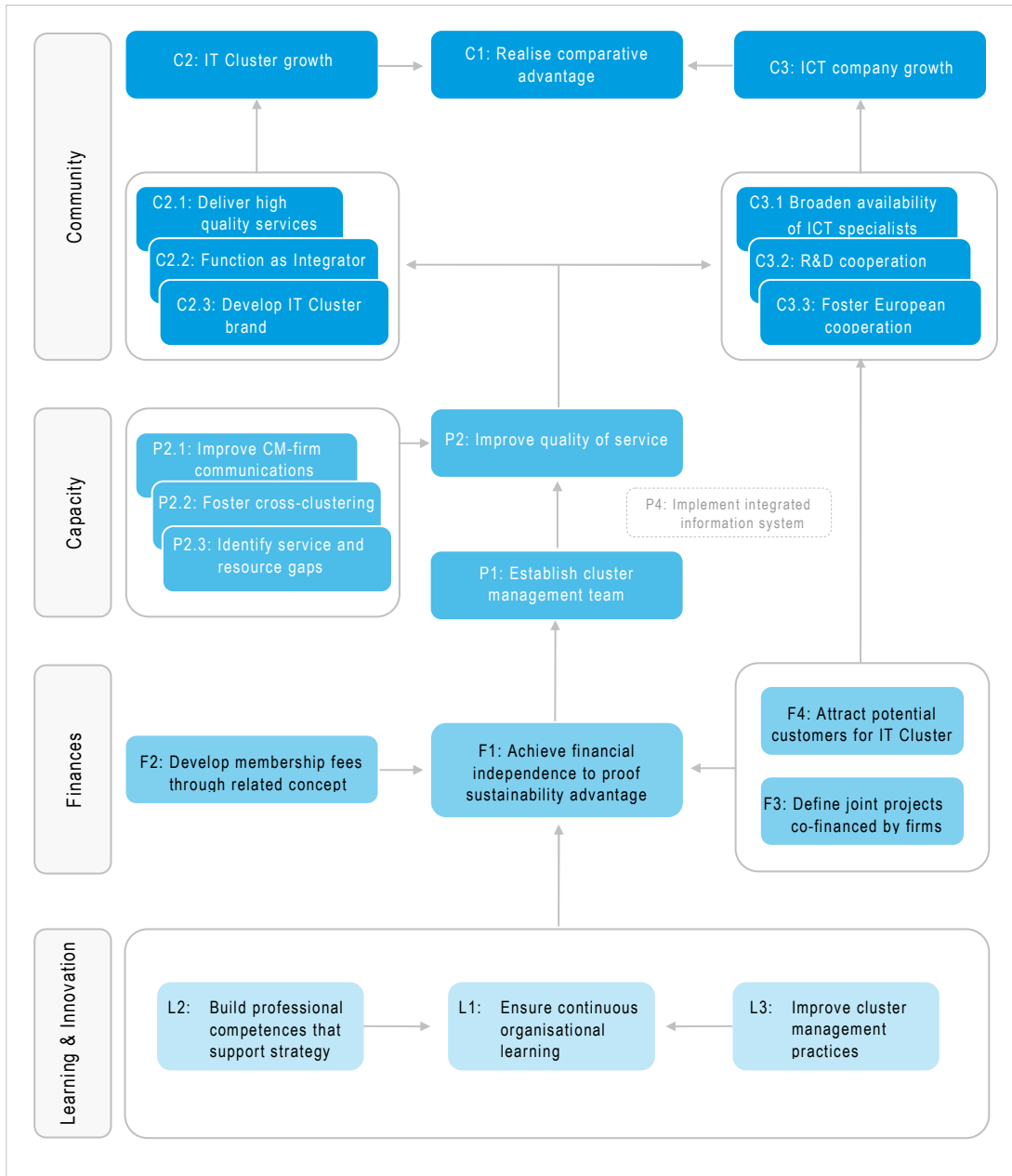
As relevant stakeholders (community) companies, universities, research institutes and secondary education institutions as well as political and administrative bodies have been identified. In this stage of the BSC process the question arose whether the community shares the defined vision or not. The conclusion was that the community does share the vision but may have a different view on how to achieve it. Furthermore, financial resources, internal processes and cluster management competencies which are defined through processes and services are seen as relevant to achieve the vision. By combining strategic themes with perspectives the strategic framework has then been set and critical success factors have been identified.

Figure 11: Critical Success Factors



Based on this discussion the following strategy map was developed.

Figure 12: Strategy Map IT Cluster Ostrava



The workshop participants have identified community satisfaction, provision of value-added services and improved relationships with companies, universities and other stakeholder as IT Cluster's general objectives for the community perspective. Highlighting its service role for both, the cluster and the single companies, this perspective was placed at the top of the strategy map.

IT Cluster's internal processes lists continuous improvement of quality and service, and the establishment of a cluster management team as its major objectives. Currently the executive board with its five members (leading ICT companies, the regional development agency and the university) is substituting the cluster management. For the future it is intended to assign only steering functions to the executive board.

The learning and innovation perspective focuses on IT Cluster's abilities to improve and create value for its community. The management's objectives for this perspective include: (a) improvement of cluster management practices through networking at European level, (2) seizure of continuous organisational learning through benchmarking and (c) development of strategy-related skills.

Concerning the financial perspective the main objective of IT Cluster is to achieve financial independence and thus, proof the cluster's sustainability.

Final step in the workshop was the discussion about appropriate measures (indicators), activities required to deliver the desired outcomes, and priorities of and responsibilities for these tasks. The outcomes of the discussion are summarised in the following table.

Table 1: Strategic Initiatives, Priorities, Responsibilities and Measures

Initiatives	Priority*					Responsibilities	Time horizon	Indicators
	1	2	3	4	5			
<b>Community Perspective</b>								
Development of an integrated concept to enlarge number of ICT specialists focusing on all educational levels					x	University in cooperation with cluster management team		<ul style="list-style-type: none"> <li>Number of graduates</li> <li>Number of elementary and secondary school visits</li> <li>Apprenticeship Model</li> </ul>
Market Survey			x			Cluster management team in cooperation with one or two companies		
Joint Projects among universities, companies & customers						Company which has the idea initiates the project, cluster management team moderates the process of cooperation/ matching		<ul style="list-style-type: none"> <li>Number of established thematic task forces</li> <li>Number of companies involved in matching process</li> </ul>
Development of a Matching Strategy						Cluster management team		
Thematic Technology Transfer		x						
Improvement of joint R&D activities between companies and university (bi-directional communication structure needs to be established)			x			University, companies Cluster Management Team (support of companies)		<ul style="list-style-type: none"> <li>Number of diploma thesis conducted in/width companies</li> <li>Number of companies involved in FP7</li> </ul>



Initiatives	Priority*					Responsibilities	Time horizon	Indicators
	1	2	3	4	5			
Establish international links			x					<ul style="list-style-type: none"> <li>Number of international projects, joint ventures, cooperation</li> </ul>
<b>Internal Perspective</b>								
Development of a shared idea/ understanding of the tasks and functions of the cluster management					x			
Overall: Establishment of a Cluster Management Team based on a consensus					x			
<ul style="list-style-type: none"> <li>Commitment of Executive Board to establish a CM Team; recruitment should be assigned to the cluster manager</li> <li>Development of a business plan for a Cluster Management Agency</li> </ul>								
Space for new ideas								
<b>Innovation &amp; Learning</b>								
Mapping of companies competencies, products & services to communicate the clusters profile								
Establishment of a monitoring system for strategic activities								
Mapping of synergies								



Initiatives	Priority*					Responsibilities	Time horizon	Indicators
	1	2	3	4	5			
<b>Financial Perspective</b>								
Preparation of feasibility study including definition of joint projects & co-funding by companies					x	ARR	ongoing	<ul style="list-style-type: none"> <li>▪ Number of paying members (membership fees)</li> <li>▪ Contribution of companies to the business plan of structural funds (being a project leader)</li> <li>▪ Number of employees &amp; firms</li> <li>▪ Economic indicators (turnover, export etc.)</li> </ul>
Communications					x		To be continued	

(\* 1=low, 5=high)

The discussion on initiatives was most detailed and concrete on the issue 'ICT specialist growth'. In a first round ongoing activities have been discussed. One major cause for the lack of ICT specialist has been the brain drain during recent years. Since the region's image is improving this process might slow down and in medium term be disrupted. As supportive action a related marketing campaign has been launched jointly by regional authorities and the regional development agency.

Further ongoing activities are directed towards the university's capacities. At university level a consensus among the seven faculties exists that premises are an important physical precondition in order to affiliate more students. Furthermore, they agreed on assigning new teachers. Already at current stage companies are engaged in teaching.

As future activity to broaden the ICT specialist base in mid-term, the intensification of university marketing across Czech Republic – addressing mainly grammar schools – has been discussed. Here it is of high interest to attract more females since their share is still small and therefore, a specific gender marketing strategy needs to be developed.

Up to date the main ICT specialists do have a university degree. Vocational education and especially the apprenticeship (currently integrated in secondary school) is not well-established and thus, need improvement to cover the short-term needs. Against this background it was discussed if the Swiss system for vocational education in informatics could be transferred to Czech Republic. Since Berne region and especially tcbe was one of the key actors in establishing the nationwide apprenticeship in Switzerland they have in depth knowledge on developing and implementing such. Detailed information on the Swiss vocational education for informatics is to be found in the appendix.

The discussion concluded with the definition and quantification of measures which can be summarised as is shown in the following table.

Table 2: IT Cluster – Measures for IT Specialist Growth

Indicator	2006	2011
Number of Graduates	300	1.000
Number of Teachers including doctoral students	50	100
Company activities in vocational education	Mapping	Supporting
Apprenticeship	Analyse Swiss System	
Marketing	x visits in secondary school outside the region	
	x visits in elementary schools in the region	



### 3.3 RESUME

Of course the described outcome of the BSC workshop only gives a first idea on how the scorecard for the management IT Cluster could look like and, although there are quite some blank spaces left, it gives an insight in some of the intended key performance outcomes and related performance drivers. Nevertheless, before implementation the strategy map, as well as the list of initiatives need refinement and concretisation.

However, the workshop was a first step towards a structured strategy discussion about the management of IT Cluster. It has come to the fore that the persons involved in cluster management have neither a shared idea nor a common understanding of the tasks and functions of cluster management. Thus, it will be one of the first actions to develop such and based on a consensus establish a cluster management team. Furthermore, the lively discussions during the workshop have led to a concretisation of cluster management's vision and strategy. Accordingly, the workshop participants assessed the BSC as an applicable instrument for strategic cluster management worth further development. With regard to IT Cluster's organisational structure as association BSC bears the chance to strategically focus the operative work and to give account for the work done to the general assembly and the executive board.

To summarise, the principals behind the scorecard concept seem to be well suited to target the challenges of strategic cluster management. Not only does the BSC target financial factors, it provides a basis for determining other important factors that influence how cluster management organisations can work towards their vision. The design process helps to transform often vague and multiple objectives into an actionable strategy. And, last but not least, it allows cluster management organisations to maintain attention on several areas such as quality of service, budget, internal processes and learning. Certainly, one of the major challenges is to incorporate the stakeholder vs. community complexity directly into strategy.

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## ANNEX

## Appendix I -CHECKLIST STRATEGY MAP

The following set of questions can be used to self-assess the developed strategy map:

### Community Perspective

1. Have we defined our target customer and stakeholder segment(s)?
2. Do the defined objectives in the community perspective reflect a core value proposition?
3. When crafted our community's objectives, did we ask ourselves what is expected or demanded from us?

### Internal Processes Perspective

4. Do the objectives defined in this perspective answer the question of how we will achieve community outcomes?
5. When developing these objectives did we consider the four key processes operations management, customer (community) management, innovation, regulatory and social.

### Financial Perspective

6. Do the objectives in the financial perspective relate to the community and internal processes perspectives?
7. Have both, the definition of new value-added community-centric services and deepening relationships with current stakeholders been taken into account?

### Learning and Innovation Perspective

8. Does our strategy map address human capital (skills, knowledge) within our organisation, by improving objectives related to employees' readiness, training or recruitment, and retention?
9. Have we considered organisational capital such as culture, leadership, alignment, and teamwork in this perspective?

### General

10. Do we have an appropriate number of objectives on our map considering our size, culture, ability to execute and desired number of performance measures?
11. Have we linked our objectives together in a pattern of cause and effect relationships that tell our strategic 'story'?
12. Does the structure of our strategy map with regard to the position of the four perspectives reflect our culture and beliefs?

## Appendix II - IT VOCATIONAL EDUCATION IN SWITZERLAND

### II.1 Basic Conditions & Framework

The Swiss education system can be divided into three educational levels: primary, secondary and tertiary. In general schooling begins at the age of seven, when children move from Kindergarten into Primary School. *Primary* and *Secondary Level I* education are compulsory and sum-up to at least nine years. *Secondary Level II* comprises another 3 to 4 years of education, divided into Gymnasium, the Intermediate Schools, and Vocational Education. The *Tertiary Level* includes on the one hand the university-system (universities including academic graduate schools; Universities of Applied Sciences, which focus on areas such as engineering, business administration, and arts), and on the other hand several forms of higher continuing vocational education. Concerning the latter, two forms are of specific interest: Firstly, the variety of vocational colleges which lead to a vocational diploma – in contrast to a academic diploma – focusing on areas like engineering, business administration, social work and arts. They offer two year full-time or three year part-time programmes (Berufsmature), which can be integrated in the apprenticeship, and moreover a wide range of postgraduate programmes. Secondly, there are many courses/schools which prepare students for advanced professional examinations, mostly awarding the higher federal diploma or licence.

Concerning the Secondary Level II the vast majority of young people – about 65% – begin vocational education after the finished secondary school at the age of 16 to 17. Vocational education is characterised by a twofold duality: First, it is a combination of general education and vocational training/education, according to a curriculum regulated by the federal government. Second, it is mostly run through a cooperation of enterprises and vocational schools. While companies train apprentices directly at the worksite 3 or 4 days a week, the apprentice is attending vocational school 1 or 2 days, where he/she acquires both occupation-related knowledge and further general education. This so-called dual system – which is also to be found in Germany and Austria – is increasingly extended to a tripartite system through the introduction of additional vocational training courses lasting several weeks, so-called ‘sandwich courses’.

In order to become apprentices, secondary school students must apply for a position at a firm. In the dual system apprentices do not pay any fees. Vocational courses are free of charge for anyone who has an apprenticeship contract which is approved by the cantonal authorities. The practical training is also regulated by federal legislation. Apprentices are paid a monthly salary. At the end of the basic vocational education apprentices take a final examine and receive in case of success a Federal Apprenticeship Certificate which is recognised all over Switzerland. In general the final examination comprises a practical and two theoretical parts, one technical, the other general.

Vocational schools are financed mainly by the state: While the federal government covers 10 to 30% the cantons, which also employ the teaching staff, bear the main financial share of the vocational education. Furthermore, professional associations contribute to the system by financing

learning materials and courses for continuing education. The practical training of apprentices in companies is completely financed by the firms themselves. The ratio of costs for and earnings through apprentices varies strongly between enterprises and branches.

According to the vocational education law, the vocational education is a combined responsibility of the Confederation and professional organisations. The Confederation, which is represented by the Federal Office for Professional Education and Technology (OPET), has the overall strategic control over vocational education. Amongst other aspects, this responsibility involves legislation, quality assurance, further development of the overall system, and encouragement of innovation.

The cantons organise the implementation and monitoring of the vocational education. The cantonal vocational education departments are the executive bodies for vocational education. The operating of part-time and full-time vocational schools as well as professional information and career counselling centres also belong to the scope of tasks of the cantons. The entities responsible for the professional environment (companies, professional associations, social partner, other responsible organisations and providers of vocational education) define the learning contents, mediate vocational qualifications and provide apprenticeships.

According to Seitz et al. (2005: 5) Switzerland attaches great importance to vocational education. *'Seven percent of the employees in the secondary and tertiary sectors of economy are apprentices. Courses in 200 different disciplines are offered. The participation of an enterprise in vocational education increases significantly with firm's size.'* About 33.0 % of all companies in the above mentioned sectors of the economy with more than one occupied person have at least one apprentice (Seitz et al.: 2005).

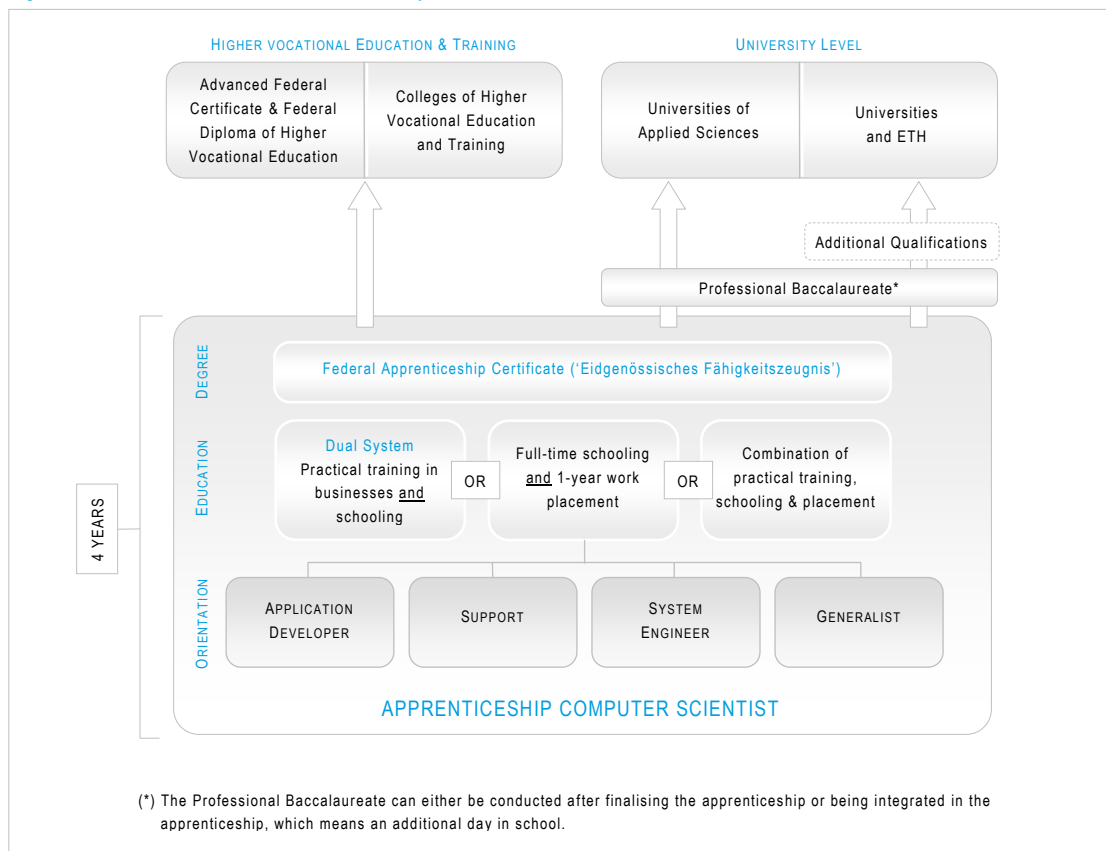
## II.2 Introduction

After four years of pilot testing in six cantons in Switzerland the modularised apprenticeship in informatics, the so-called **COMPUTER SCIENTIST** has been introduced nationwide in 2005. At January 1<sup>st</sup>, 2005 the ordinance on vocational basic education came into force, which regulates the job description and emphases, the contextual and temporal framework as well as the qualification areas and procedures. Since summer 2005 basic education in informatics in Switzerland takes place following the module concept.

According to the ordinance Computer Scientists conceptualise, implement, integrate, test, prosecute and operate IT hardware, software and processes (BBT, 2004). In order to meet businesses diverse requirements and to create well-defined qualification profiles the apprenticeship has been broken down into the three main strands 'Application Developer', 'Support' and 'System Engineer', and the so-called 'Generalist'. In general the training duration amounts 4 years and ceases with acquirement of the so-called 'Eidgenössischen Fähigkeitszeugnis' – the federal apprenticeship certificate, which on the one hand certifies that the apprenticeship has been finished successfully and on the other hand paves the way to higher vocational education.

As is shown in Figure A1, one has three options to accomplish the apprenticeship: Firstly, the dual system, which combines practical on-the-job training with schooling: While the employer's task is to teach the apprentice practical skills, the vocational school imparts theoretical knowledge required for the chosen career, as well as general subjects. Secondly, the off-the-job training in computer science or private schools combined with a work placement of no less than 1 year. And third, a combination of all three elements.

Figure A1: The Swiss Vocational Education System in Informatics



IT vocational education is subsidised by the federal government based on pre-defined measures such as number of apprenticeship positions. The subsidy is transferred from the federal government to the canton and further on to the educating companies.

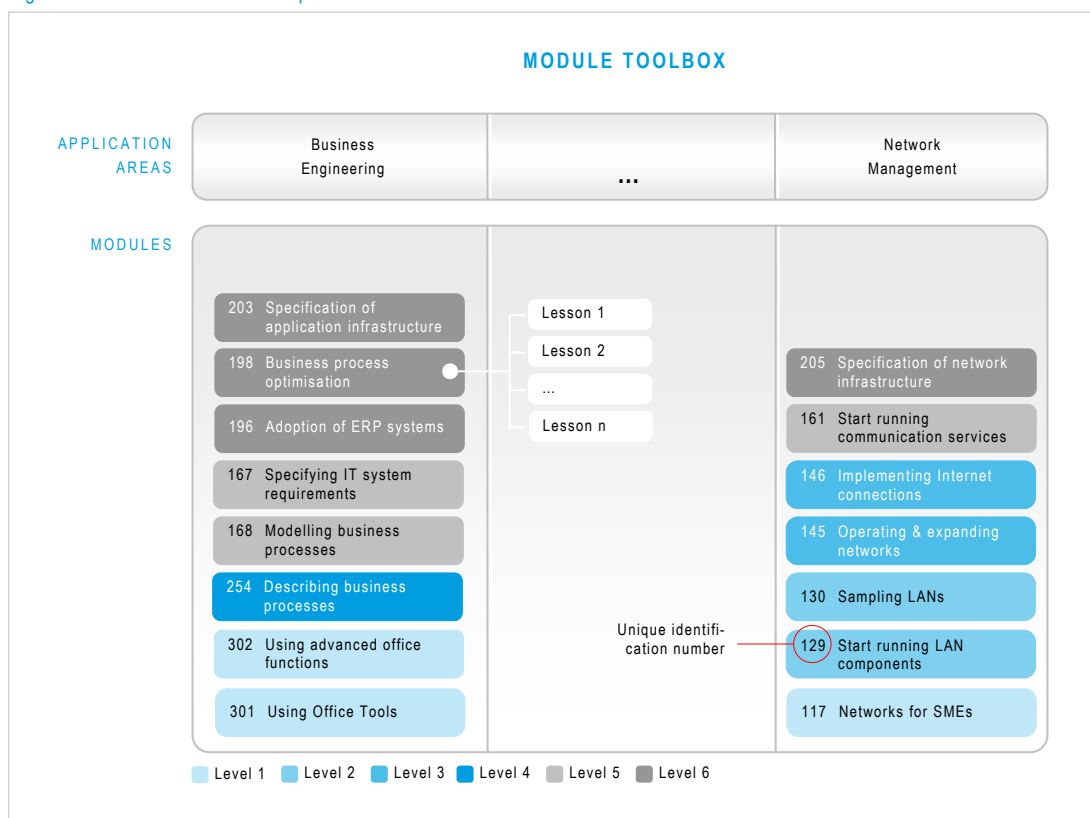
### II.3 Occupational Image & Learning Contents

The apprenticeship is based on a set of learning modules structured by application areas and six educational levels. Thus, learning contents are easy to be updated. Each strand comprises a minimum of 12 basis modules, chosen by the canton out of a catalogue of 16 modules and must

comprise at least 6 application areas. Next to mandatory modules which cover the basic job requirements, optional modules which allow specialisation in specific fields can be chosen.

The barycentric education comprises at minimum 6 modules of learning level 2 to 4. The range of application areas, which are oriented towards functions observed in Swiss ICT companies, varies depending on the respective strand. The following areas have been defined: Business Engineering, Data Management, Web Engineering, Application Engineering, Technical Software Engineering, Service Management, Hardware Management, System Management, Network Management, ICT Project Management, ICT Management, ICT Business Economics, ICT Quality Management, ICT Risk Management, and ICT Security. Except for ICT Management, ICT Quality Management and ICT Risk Management all application areas comprise at least one learning module of level 1-4. The toolbox systematic is shown in Figure A2.

Figure A2: Module Toolbox Computer Science



The description of competence, which refers to professional, methodological and social skills required to handle a specific work process proper, most efficient and complete, is at the centre of each module identification. From this so-called action goals have been deduced. According to this approach, professional competence only exists, if a person can accomplish work processes completely. This includes gathering information, planning, decision making, implementation, controlling, appraisal, and adoption. Thus, functional, methodological and social competences are understood as a whole. Single competences are bundled to application areas. A learning level has



been assigned to each module. Of the six levels, level 1-4 are exclusively for the apprenticeship Computer Scientist, whereas levels 5-6 are for the higher vocational education

Table 3: Module Identification – An Example

Module number	254
Title	Describing business processes
Competence	Documenting business processes, job analysis, visualisation of process flows
Action goals	<ol style="list-style-type: none"> <li>1. Definition and documentation of relevant process information (appellation, triggering event, result, trigger, recipient) based on a verbal or written description of a consultation</li> <li>2. Decomposition of business processes into single process steps and visualisation of the process flow on basis of common description standards.</li> <li>3. Specification of the process flow through additional information like required additives, executing unit and description of the output to be produced.</li> </ol>
Application area	Business Engineering
Level	4
Prerequisites	<ul style="list-style-type: none"> <li>▪ Interpretation of standard business flows</li> <li>▪ Assignment of top-down approaches for documentation</li> </ul>
Number of Lessons	40
Admission	Eidgenössisches Fähigkeitszeugnis Informatiker/in

## II.4 TCBE's Role

The ICT cluster Bern (tcbe) has been one of the initiators and key figures in the development and nationwide implementation of the apprenticeship Computer Scientist. A brief historical retrospect: In 2000 a study on IT training and tuition needs was conducted and resulted in the launch of the 'Informatikoffensive 2001', a governmental initiative to strengthen the secondary IT education in Berne. The initiative aimed at developing a new concept for IT vocational education taking into account market needs. The initiative was carried out by i-BE, an organisation jointly financed by tcbe, the canton and the commercial-industrial vocational school Berne (gibb – Gewerblich-industrielle Berufsschule Bern). Furthermore, i-BE was one of the initiators of I-CH cooperative which has been established in September 2000 and represents Switzerland's most important umbrella organisations and trade associations. During 2001 and 2004 the developed modules have been tested by i-BE in cooperation with its regional partners. Among other duties, i-BE was responsible for the organisation of vocational education, planning, governance and evaluation of the module concept during pilot testing.

In July 2004 i-Bern GmbH (Ltd.), a wholly owned subsidiary of tcbe was founded in order to coordinate the cluster's activities in vocational training and especially as regards the apprenticeship in informatics. According to the vocational educational law, regulations for basic vocational education are worked out in cooperation by the federal state, the particular canton and industry

organisations. In this context i-Berne acted as industry organisation and thus, was responsible for the definition of the educational contents which have been cross-checked by the federal state organisation and adopted jointly by all three partners. Starting with the formation of the project group to the point the basic vocational education starts, this process takes usually up to three years.

i-Bern's main tasks in the operational execution as 'industry organisation' in the basic vocational educational system are:

- the organisation and accomplishment of the final examination;
- the distribution of national and cantonal subsidy for IT vocational education;
- the representation of the members' interests regarding learning content;
- the promotion and assurance of high quality in ICT education;
- the outward representation of the sector and the educational institutions;
- and the promotion of the availability of apprenticeship training positions to ensure future needs concerning qualified workforces.

Furthermore, i-Berne is involved in the so-called 'joint apprenticeship', which refers to a apprenticeship concept where the apprentices are employed and advised by i-Bern GmbH and are trained in several companies belonging to the network. Thus, firms who are, for various reasons, not able to accomplish the apprenticeship by themselves can take a stake in vocational education. The services i-Bern offered in this context can be summarised as follows:

- search for suitable apprenticeship training positions
- recruitment and employment of apprentices
- operational tasks (including payment) related to the apprenticeship
- coordination of the apprenticeship programme
- supervision of the apprentices' school performance
- support of participating companies

In addition i-Bern offers in further vocational education courses for instructors covering topics such as development of professional and methodological competences, and didactical methodologies. These courses do not only aim at acquiring new knowledge, but also to exchange experiences with the apprenticeship among firms.