# Maturity Assessment of Strategy Implementation in Higher Education Institution

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**Abstract**. *The purpose of the paper is to identify and analyse the core processes and additional processes within the complex strategy implementation process and to assess their capability levels. Based on the assessed process capability levels, maturity assessment of strategy implementation in a higher education institution has been demonstrated. The Balanced Scorecard (BSC) method was used in research in order to identify the key processes of strategy implementation, while the ISO/IEC 15504 standard was used for the capability assessment of the identified processes in order to determine the real maturity of strategy implementation in a higher education institution.*

**Keywords.** Strategy implementation, higher education, BSC, ISO/IEC 15504, ISO/IEC 15288, ISO/IEC 15289, assessment, capability level, maturity level

## 1 Introduction

Strategy implementation is one of the phases of strategy management. Associated processes are very important but very complex due to their implementation and continual improvement. The purpose of this paper is to identify the key processes of strategy implementation in a higher education institution and assess their actual capability, as well as to determine the maturity level of strategy implementation in general.

The Balanced Scorecard (BSC) is a modern method of great importance for the process of strategic management. The BSC translates an organization's vision/mission/strategy into a comprehensive set of performance measures that provide the framework for strategic measurement and management systems (Kaplan & Norton, 1996). Using this method, the authors have identified the key processes of strategy implementation and analysed their outcomes, as well as their input and output work products. *What are the strategic goals and critical success factors in order to achieve our vision? What metrics are required to monitor progress? What action plans are required to achieve strategic goals and critical success factors?* These are just some questions important for strategy implementation and its core processes.

In addition to the core processes, additional project and organization/management oriented processes also support strategy implementation. In the paper, these processes are systematized and assigned to relevant maturity levels initially based on information technology-related standards.

The ISO/IEC 15288 (2008) standard was used to build the initial set of additional processes, while ISO/IEC 15289 (2011) was used to identify input and output work products (information products – documentation) related to the selected processes.

ISO/IEC 15504 (2003) was used for capability assessment of identified processes in order to determine the true maturity level of strategy implementation in a higher education institution and suggest the necessary improvements.

The paper has been structured in several chapters. **Chapter 2** describes how a set of strategy implementation processes has been built. The process assessment model (PAM) according to ISO/IEC 15504 is described in **Chapter 3**. In order to generate the maturity level of strategy implementation, it is necessary to first assess the capability level for each of the identified processes in strategy implementation. This assessment is based on the PAM concept and described using several steps in **Chapter 4.**

## 2 Strategy Implementation Processes in Higher Education

Nowadays, more than usual, higher education institutions (HEIs) are facing many changes in all aspects – social, political, economic. This uncertain environment requires HEIs to put more effort and engagement in strategy development and implementation based on deep analysis of all factors

affecting strategy success. In this regard, HEIs should act as any other business, i.e. commercially oriented company.

According Shah and Sid Nair (2014), literature on the development and implementation of strategies is limited to universities, and the authors argue the need for involvement of universities (HEIs) in the development and implementation of strategy (strategic decisions) which would be consistent with the institution's resources and risk management.

Regardless of the strategy decision quality, the way the implementation of strategy is prepared and executed, and the final results are comprise the main indicators of strategy success. Maturity of HEIs for strategy implementation and capabilities of strategy implementation processes are the focus of this paper.

According to Harrington (2006), strategy implementation is an iterative process of implementing strategies, policies, programmes and action plans that allow a company to utilize its resources in order to take advantage of opportunities in a competitive environment. Many factors should be considered in order to make strategy implementation successful.

Kaplan and Norton (1996) related to the balance scorecard approach in implementing strategies and identified four main implementation factors: clarifying and translating vision and strategy, communication and linking, planning and target setting, and strategic feedback and learning.

Based on analyses of previous strategy implementation frameworks, Okumus (2003) identified 11 key implementation factors: strategy development, environmental uncertainty, organizational structure, organizational culture, leadership, operational planning, resource allocation, communication, people, control, outcome; grouped in four categories: strategy content, strategy context, operational processes and strategy outcomes.

In the analysis presented in the paper, the Okumus strategy implementation framework (2003) has been used to build the initial set of key factors and to link them to the processes which should be considered during all phases of strategy implementation.

In Table 1, the first two columns relate to strategy implementation factors and related issues. The factors are grouped into Strategy context (external), Strategy context (internal) and Operational process.

The third column of Table 1 contains processes - some of them mapped to those defined in ISO/IEC 15288 and ISO/IEC 15504-2 standards, as well as process purposes.

These processes are defined on the basis of pre-defined and systematized factors and issues that affect the success of the implementation strategy. The focus is on strategy implementation processes (later treated as *core processes*) related to the factor *Operational planning and communication* and their foundation, comprising the methodology of the Balanced Scorecard (BSC).

This analysis does not cover specific business processes used in realizing strategy / strategic decision, as this depends on area of implementation, in this case the aspect of challenge of university/HEI functioning (eg. introducing a new study programme, internationalization – attracting foreign students).

Based on the Balanced Scorecard methodology, the following issues and processes (*core processes* of strategy implementation) were defined:

- Strategic decision operationalization (strategy map definition): processes of definition perspectives, strategic goals, critical success factors (CSF), key performance indicators (KPI) and cause-effect relationships among objectives & goals;
- Definition of the strategic decision implementation plan (the project – tasks, time, resources) – the process of defining action plans;
- Communication of the strategic decision implementation plan;
- Control of strategic decision implementation activities (implementation/action plan control) – the process of control and feedback;
- Improvement of strategic decision implementation activities

Mapping of strategy implementation factors/criteria to the system life cycle processes from two groups - *Organizational project-enabling processes* and *Project processes* (ISO/IEC 15288, 2008) - were used for systematization of other processes required to implement strategy/strategic decisions.

Documentation (work products) as indicators to assess the capability of the processes have been systematised based on the ISO/IEC 15289 (2011) standard.

The full list of input and output documentation for each process is not presented in the paper. Only documentation for one process is given, as an example. Input documentation (work/information products) for the process of *Risk management* should consist of:

- The project management plan;
- The risk management plan;
- The risk profile (list of risks);
- The quality assurance procedure;
- The problems report

Risk management output documentation (work/information products) for the same process should contain:

- The risk management policy and plan;
- The risk action request;
- The monitoring and control report

Later in process assessment (Chapter 3), this documentation would be used as one of the indicators for determining the level of process capability.

**Table 1 -** Strategy implementation factors, criteria/issues and the processes related to the process of strategy implementation

| Factors (*SIF* in (Okumus, 2003)) | Criteria (*Issues* in (Okumus, 2003)) | Process (*mapped to ISO/IEC 15288*): process purpose |
|---|---|---|
| **Strategy context (external)** | | |
| 2. Environmental uncertainty | **Risk management** | *Risk management*: the process continuously identifies, assesses and reduces risks |
| **Strategy context (internal)** | | |
| 3. Organizational structure | **Organization structure and decision making style coherence** | **Organizational structure definition:** the process defines key components of the organizational structure - roles, responsibilities, communication, ... |
| | | **Alignment of organizational structure and decision-making:** the process adjusts the decision-making process and organizational structure |
| | **Integration of information systems** | **Integration of information systems - departmental/institutional - with the central/university IS (*Information management*):** the process provides relevant, timely, complete, valid and, if necessary, confidential information to all involved parties in making and implementing strategic decisions, as well as those decisions influenced by them |
| | **Quality culture** | *Quality management*: the process defines requirements, controls and oversight, and continuously improves the quality of organizational processes, procedures, and results |
| 5. Leadership and decision making (style) | **Setting goals** | **Leadership involvement in development and implementation of strategy:** the process defines the efforts to achieve active participation of the management in strategy development and its effective presentation (communication) to all stakeholders |
| | **Decision making** | **Decision making (*Decision management*):** the process selects the most useful means of taking action if there are alternatives |
| | | **Leadership (*Project portfolio management*):** the process ensures adequate/optimal uptake of organizational resources in successful (simultaneous) implementation of all organizational projects |

**Table 1.** Strategy implementation factors, criteria/issues and the processes related to the process of strategy implementation (cont.)

| Factors (*SIF* in (Okumus, 2003)) | Criteria (*Issues* in (Okumus, 2003)) | Process (*mapped to ISO/IEC 15288*): process purpose |
|---|---|---|
| **Operational process** | | |
| 6. Operational planning<br><br>8. Communication | **Strategic decision operationalization (strategy map development)** | **Definition of perspectives:**<br>the process of defining perspectives/business aspects |
| | | **Definition of strategic goals:**<br>the process defines the desired future state of the organization with respect to business prospects |
| | | **Definition of Critical Success Factors (CSF)** that contribute to the achievement of strategic objectives:<br>the process determines internal and external factors that affect the achievement of the strategic objectives |
| | | **Definition of Key Performance Indicators (KPI)** against the strategic objectives and their target values:<br>the process defines metrics/measurements and their target values |
| | | **Definition of cause-effect relationships** among objectives:<br>the process analyses the correlation among goals within the perspectives - lagging perspectives (such as learning and development, and operational excellence) and leading perspectives (such as clients and their satisfaction, as well as financial success) |
| | **Definition of the strategic decision implementation plan (the project – tasks, time, resources)** | **Definition of actions plans in order** to achieve objective target value (*Project planning*):<br>the process links strategic objectives with potential strategic initiatives and define the ways they can be realized |
| | **Communication of the strategic decision implementation plan** | **Communication of the strategic (decision implementation) plan** on all organizational structure levels:<br>the process ensures awareness and understanding of business objectives and ways to achieve them |
| | **IMPLEMENTATION - business processes that realize strategy/strategic decision (depending on the implementation area)** | |
| | **Control of strategic decision implementation activities (implementation/action plan control)** | **Control and feedback on strategic decision implementation** (*Project assessment and Control and measurement*):<br>the process ensures the execution of the measurement and other evaluation processes for the purpose of reporting on the progress of implementing strategic decisions and improvement possibilities |
| | **Improvement of strategic decision implementation activities** | **Improvement activities for implementation and monitoring of strategic decisions** (*Quantitative performance management and Change management*):<br>the process successfully (on time, with minimal risks, taking into account all aspects and affected processes and stakeholders) improves the process of strategic decision implementation and improves the strategic map based on the analysis of control results |
| 7. Resources | **Resources (material)** | *Resource (asset) management/Infrastructure management/Configuration management*:<br>the process defines, provides and maintains assets - objects, tools and communication, and information technology necessary for running the business |
| 9. People | **People** | *Human resource management and Knowledge management-KM*:<br>the process ensures optimal structure of the staff, their roles, scheduling and their abilities/knowledge (recording, promotion and documenting - KM) |

# 3 Process Assessment Model According to ISO/IEC 15504

Assessment was conducted according to the model defined in the requirements of ISO / IEC 15504-2 Information technology - Process assessment - Part 2: Performing an assessment. The basic model for such an assessment is shown in Fig.1 (ISO/IEC 15504-2, 2003).

The concept of the Process Assessment Model (PAM) according to ISO/IEC 15504-2 includes two dimensions: the process dimension and the capability dimension and attributes (measurement framework). The process dimension is related to the concept of the Process Reference Model (PRM). A PRM defines processes in terms of a purpose statement and one or more outcomes that should be satisfied when the process is performed. It is important in order to achieve the purpose of the process or the relevant process capability. In this research, the PRM is related to the strategy implementation process and its practices.

The second dimension of the PAM is related to the measurement framework for the process capability assessment through process attributes and relevant capability levels (incomplete, performed, managed, established, predictable and optimizing). A PAM also contains indicators used in the assessment process in order to determine the process attribute rating for each process. Process performance indicators such as base practices and work products are used only for the attribute PA1.1. Process capability indicators such as generic practices, generic resources and generic work products are used for all attributes (from PA1.1 to PA5.2). Capability level CL0 is related to the incomplete process. This process is not implemented or fails to achieve its process purpose. Capability level CL1 is related to the performed process. This is

an implemented process that achieves its process purpose. Capability level CL2 is related to the managed process. The previously described performed process is planned, monitored and adjusted, and its work products are appropriately established, controlled and maintained. Capability level CL3 is related to the established process. The previously described managed process is implemented using a defined process that is capable of achieving its process outcomes. Capability level CL4 is related to the predictable process. The previously described established process operates within defined limits to achieve its process outcomes. Capability level CL5 is related to the optimizing process. The previously described predictable process is continuously improved in order to achieve business goals.

# 4 Maturity Assessment of Strategy Implementation Using the ISO/IEC 15504 Standard

In order to conduct the maturity assessment of strategy implementation in an institution, the authors have identified the main processes within the strategy implementation activity and assigned them to relevant maturity levels from 1 to 5 (shown in Fig. 5). The basic process set (minimum and additional) was assigned to maturity level 1 (ML 1) and the extended process set (minimum and additional) was assigned to maturity levels 2 to 5 (ML2 to ML5).

In order to generate the maturity level of strategy implementation, it is necessary to first assess the capability level for each process assigned to our maturity level categories. This process capability assessment was based on the previously described PAM model according to the ISO/IEC 15504 standard
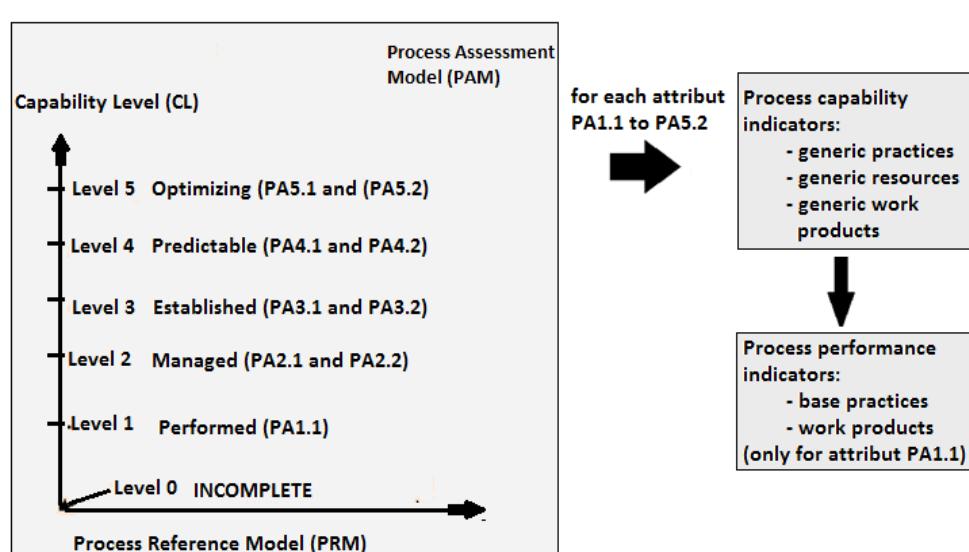


**Figure 1 -** The Process Assessment Model according to the ISO/IEC 15504-2 standard

and conducted through several steps. A special rating scale (NA – not applied (0-15%); PA – partially achieved (15-50%); LA – largely achieved (50-85%); FA – fully achieved (85-100%)) was used for the assessment.

Assessment steps are described below.

Step 1: to define the target capability level for the assessment of all identified processes within strategy implementation. For the purpose of our research in this paper, the target capability level is CL2 (Managed).

Step 2: to assess the capability level for each process within the strategy implementation according to the PA1.1 attribute in order to explore whether the process achieves its purpose. In the research, the authors have conducted capability assessment for all strategy implementation processes. Assessment for the Quality Management process is described in the paper in detail. The assessment procedure is equal for all other processes. The capability assessment for quality management according to the PA1.1 attribute is shown in Fig. 2. Process performance indicators are different input/output work products which depend on process outcomes.

Step 3: to assess the capability level for each process within the strategy implementation according to the PA2.1 and PA2.2 attributes in order to explore whether the performed process is managed. Capability assessment for the quality management according to attributes PA2.1 and PA2.2 is shown in Fig. 3. The process capability indicators are generic work products, depending on process achievements.

Step 4: to compare the assessed capability level of each process within strategy implementation with the target capability level CL2. Quality management achieves the actual capability level CL0 (Incomplete) due to the fact that the results of the assessment show that this process partially achieves its purpose (PA1.1) and criteria according to attributes PA2.1 and PA2.2 (shown in Fig. 4.). Assessed capability levels for other processes within strategy implementation are shown in Fig. 5. Some of them achieve the target capability level CL2 (and perhaps more; however, further assessment was not conducted during this research).

Step 5: to generate the maturity level from assessed process capabilities according to the following rules (ISO/IEC 33004, 2015):

- To achieve organizational maturity ML1 (Basic), all processes assigned to level ML1 should achieve capability CL1 or more;

- To achieve organizational maturity ML2 (Managed), all processes assigned to level ML1 and ML2 should achieve capability CL2 or more;

- To achieve organizational maturity ML3 (Established), all processes assigned to level ML1, ML2 and ML3 should achieve capability CL3 or more;

- To achieve organizational maturity ML4 (Predictable), all processes assigned to level ML1, ML2, ML3 and ML4 should achieve capability CL3 or more; however at least one basic process set should achieve capability CL4 or more;

- To achieve organizational maturity ML5 (Innovating), all processes assigned to level ML1, ML2, ML3, ML4 and ML5 should achieve capability CL3 or more; however at least one basic process set should achieve capability CL5 or more.

| Process: | Quality Management | | | | | | |
|---|---|---|---|---|---|---|---|
| Purpose: | Define quality requirements in all procedures and related outcomes, including controls, ongoing monitoring, and the use of proven practices and standards in continuous improvement. | | | | | | |
| | | | | | Rating Levels % | | |
| Level | Description | Outcomes | Indicators: work products | NA 0-15 | PA 15-50 | LA 50-85 | FA 85-100 |
| Level 0 Incomplete | **The process is not implemented or fails to achieve its purpose** | At this level, there is little or no evidence of any achievement of the process purpose. | | | | | |
| Level 1 Performed | **PA1.1 The implemented process achieves its purpose** | **The following process outcomes are being achieved:** | **PA1.1 satisfied** ➡ | | P | | |
| | | (1) Quality requirements are implemented in all processes. | **Input:** Quality review results, exceptions and corrections **Output:** Quality management plans | | P | | |
| | | (2) Stakeholders are satisfied with the quality of the projects. | **Input:** Business and customer quality requirements **Output:** Quality review project results | | | L | |
| | | (3) Project results are predictable. | **Input:** Quality management plans **Output:** Review results of project compliance with quality goals and plans | | P | | |

**Figure 2 -** Capability assessment of quality management according to PA1.1

| Process: | Quality Management | | | | | | |
|---|---|---|---|---|---|---|---|
| Purpose: | Define quality requirements in all procedures and related outcomes, including controls, ongoing monitoring, and the use of proven practices and standards in continuous improvement. | | | | | | |
| Level | Description | Achievements | Indicators: generic work products | Rating Levels % | | | |
| | | | | NA 0-15 | PA 15-50 | LA 50-85 | FA 85-100 |
| Level 2 Managed | **PA2.1 Performance Management: A measure of the extent to which the performance of the process is managed.** | **Achievements of this attribute are:** | **PA2.1 satisfied** | | **P** | | |
| | | (1) Objectives for the performance of the process are identified. | Objectives for performance | | | **L** | |
| | | (2) Performance is planned. | Plans for performance | | **P** | | |
| | | (3) Performance is adjusted to the plans. | Performance adjusted to plans | | **P** | | |
| | | (4) Responsibilities are defined. | Defined roles | | **P** | | |
| | | (5) Resources are defined and allocated. | Allocated resources | | | **L** | |
| | | (6) Interfaces between the involved parties are managed. | Managed interfaces | | **P** | | |
| | **PA2.2 Work Product Management: A measure of the extent to which work products produced by each process are managed.** | **Achievements of this attribute are:** | **PA2.2 satisfied** | | **P** | | |
| | | (1) Requirements for work products are defined. | Defined requirements for work products | | | **L** | |
| | | (2) Requirements for documentation and control of work products are defined. | Defined requirements for control of work products | | **P** | | |
| | | (3) Work products are identified, documented and controlled. | Identified and documented work products | | **P** | | |
| | | (4) Work products are in accordance with planned arrangements. | Adjusted work products | | **P** | | |

**Figure 3 -** Capability assessment of quality management according to PA2.1 and PA2.2

| Process name | Capability levels - CL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Level 0 | Level 1 | Level 2 | | Level 3 | | Level 4 | | Level 5 | |
| | | PA 1.1 | PA 2.1 | PA 2.2 | PA 3.1 | PA 3.2 | PA 4.1 | PA 4.2 | PA 5.1 | PA 5.2 |
| **Quality Management** | | | | | | | | | | |
| **Rating by attributes** | | **P** | **P** | **P** | | | | | | |
| **Actual CL** | | | | | | | | | | |
| **Target CL** | | | | | | | | | | |

**Figure 4 -** Actual capability level of quality management

Due to the fact that all processes (activities) within strategy management assigned to level ML1 (shown in Fig. 5) achieve capability CL1 (or even more), the maturity level of strategy implementation is ML1 (Basic). Strategy map development and its key activities were assigned to level ML1 and achieve the capability level CL1. The process of communication about the strategy implementation plans and programs between the stakeholders within the institution was also assigned to level ML1 and achieves capability level CL2.

Due to the fact that all processes within and ML2 (shown in Fig. 5) do not achieve capability CL2, the maturity level of strategy implementation is not ML2 (Managed). In general, the institution does not show the maturity of management and coordination of its key activities (processes) within strategy implementation and does not achieve maturity level ML2. The results obtained indicate the need for improvement, especially regarding management of core activities, risk management, and configuration management.
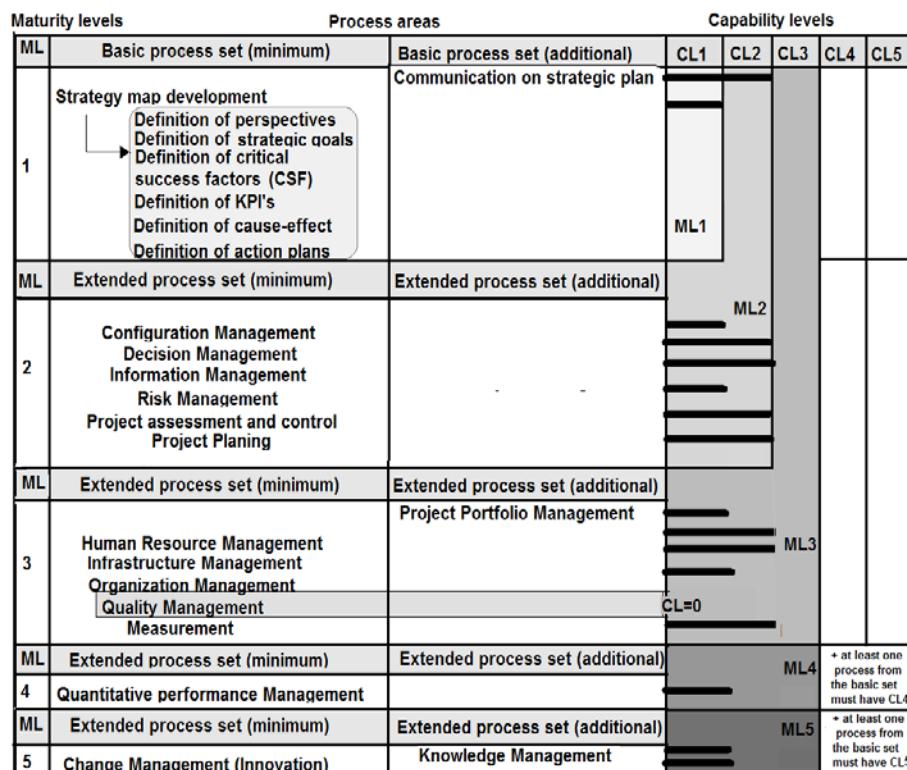
**Figure 5 -** Assessed capability level of processes within strategy implementation in relation to the target capability level CL2

# 5 Conclusion

Nowadays maturity of higher education institutions in strategy implementation is one of the prerequisites for coping with challenges in uncertain, constantly changing environments. Besides taking care of how capable core business processes (educating/teaching, research, scientific projects, …) in higher education institutions are, the management should provide capable processes for strategy implementation and capable supporting processes. Assessment of strategy implementation maturity in HEIs provides management guidelines for initiating general improvements of strategic management in general within such institution in order to achieve higher quality decision making.

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