

FEEDBACK FROM APPLICATION OF PROCEDURAL MANUAL FOR MAPPING EDUCATIONAL PROCESSES IN TERTIARY EDUCATION INSTITUTIONS

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Due to the continuing reduction of funds, management must find ways to ensure quality operation of tertiary education institutions at an optimal cost. This objective can only be achieved by quality control of the educational process. Its requirements are part of the ISO 9001 standard. Among them is the mapping of educational processes for quality management system. A practical manual was created for this purpose, which provides information on the self-knowledge of the institution. The feedback on the experiences from practical application of the general procedural manual for mapping educational processes in tertiary education institutions is presented in this paper.

1. MAPPING OF THE EDUCATIONAL PROCESS

Generally, process mapping is used to obtain information about the actual state of the management system in an institution. A management system is defined by processes which can be viewed as a set of interrelated and consecutive activities leading towards the desired goals of an institution (Lukasík, Procházka & Vaněk, 2007, p. 15). Process mapping is important in finding out what is actually realized in an institution. It is used to discover the real state of activities and to set the operation rules. By describing the activities, the system of processes realized will become transparent and also a large amount of useful information is usually obtained when data is being collected. These data are generally used to enhance the quality, increase the number of self-knowledge activities and provide strengths and weaknesses for improvement. Responsibilities and other tasks (according to the decision of the institution) will be clearly assigned. They will describe the

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processes in view of the management conditions. Another indisputable advantage of mapping is that it involves employees individually or as a team, which supports creativity and team spirit within an organization. Generally, it can be stated that the outcome of the mapping educational process is a description of processes that can be used to determine monitoring, measuring and analysis. It is used as a means of communication and leads to a clear responsibility and transparency in management.

It is important to explain what the standard of ISO 9001 is. Standard ISO 9001 specifies requirement for a quality management system where an organization needs to demonstrate its ability to consistently provide product that meets customer and applicable statutory and regulatory requirements, and aims to enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements (EN ISO 9001:2008, 2008, p. 14). Basically, the standard specifies generic requirements for organizations which need to fulfil system preconditions for quality management system.

Under ISO 9001, process mapping means that activities that comply with all the criteria of this standard are identified. These are a part of the quality management system under the standard. All activities in an organization should have a value added and, therefore, must be managed well to guarantee quality outcomes/products. This implies that the quality management system includes all the processes managed in the institution. Certain chapter titles from standard ISO 9001 are assigned to processes in an institution so as to achieve clear communication in quality management system. They are essential system prerequisites (see the chapter requirements in the standard) for a purposeful and effective management system. It must be emphasized that an institution is an autonomous management unit and must, therefore, decide itself what is essential and how to ensure compliance with the standard. If the processes in an institution have been mapped in a comprehensive and useful way, they can be easily matched with the requirements of the standard chapters. This clearly shows then which processes are commonly realized by the organization in compliance with the standard.

2. EXPERIENCES FROM APPLYING THE MANUAL IN TERTIARY EDUCATION

First, it is necessary to explain why the manual “10 steps of the mapping process” was created. Currently, there are many methods, tools and approaches for

process mapping (see references of this article), which are however designed for general application in any organization. There is no existing general guide that would provide a practical top-down manual for mapping educational processes in tertiary institutions. Therefore, using the practical experience of people who are dealing with mapping processes over the long term, a manual was developed which was specifically designed to support this target group. Following this, it would be introduced into a tertiary education institution to transfer previous practical experience in order to map the educational process.

In tertiary education institutions, the manual “10 steps of the mapping process” can be used for process mapping. This article only introduces the key parts of the manual to clarify the process steps, because the objective is to share the feedback from its practical application. The continuity of the ten-step process of the manual is shown in Figure 1: 10 steps of the mapping process. The content of each step with critical/practical experiences of applying it in institutions is described in the following text.

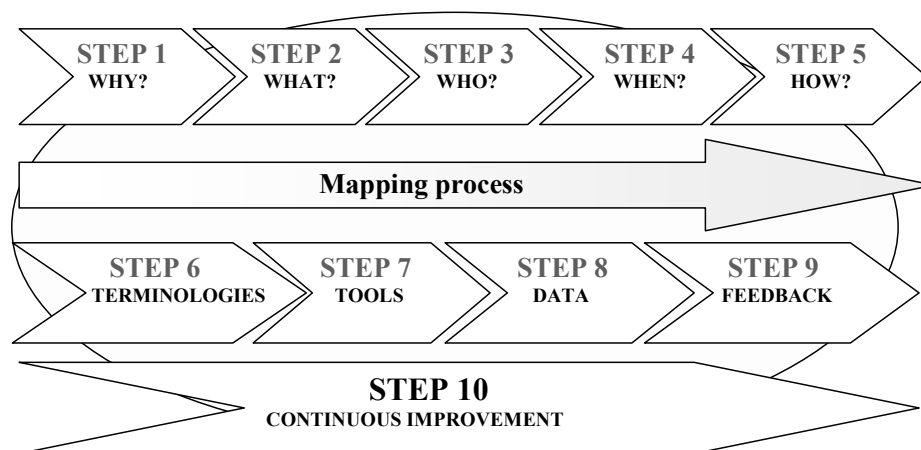


Figure 1. Ten steps of the mapping process

2.1. Step 1 – Why? (The reasons for mapping the educational process)

At the beginning, it is necessary to find the answer to the following question: Why do you/we want to map the educational processes? Each activity should have its purpose so it is necessary to know why the educational processes are going to be mapped. Not only in this case but it is also generally true that achieving a goal will always incur expenses and that is why the result should provide the organization with the highest possible added value.

- **Self-knowledge of the institution:** The essential part is self-knowledge of the institution. The management and/or the employees want to know what is realized in the institution. Conger (2011, p. 4) wrote that management is difficult, if not impossible, if the processes being managed are not completely and explicitly known. Ewy and Gmitro (2010, p. 1) wrote that clearly understanding how to manage processes has to be at the top of any educational professionals list of skills and abilities and Madison (2005, p. 23) wrote that you can see where most of the work is being performed. Nowadays, public tertiary institutions are among the largest employers so it is important to know what activities they perform (Nosek, 2012, p. 4). The result of the mapping process is making the activities transparent, which clearly shows the continuity and connection between the activities, and maps customers, products, outcomes, sources, limitations and other possible data which the institution itself marks as significant. It is useful, depending on the size of the institution, if the top management informs all/selected employees directly in advance.
- **Standardization of processes:** Another reason for process mapping is that the top management wants to have (all, essential) processes clearly standardized so that they unfold smoothly under controlled conditions.
- **Responsibility and authority:** Another need is clear specification of the employees' responsibilities for the activities performed and of their authorities. It means clear responsibilities (powers) for processes were assigned. Madison (2005, p. 14) wrote that in many organizations, the process owner is responsible for the process performance but can't make decisions concerning personnel. This is a classic mismatch between responsibility and authority. The names of work positions and organizational units have been unified and categorized.
- **Communication:** There are also other reasons: we want to increase internal and external communication. Weak and strong communication flows in both of the hierarchical directions have been found.
- **Value-added processes:** We only want to do what has an added value for us (process-costs optimization).
- **Measuring of processes:** We want to monitor and measure processes and customer satisfaction; we want to increase the objectivity of the decision-making process.
- **Process management:** We want to use process management, thus a process approach. It is also defined in the basic principles of the ISO 9001. Jeston & Nelis (2008a, p. 3) wrote that some of the recent literature in the process world has suggested that business processes are so important that the organization structure should be turned upside down to be a process-centric organization, rather than functionally based, etc.

- **Steps of changes:** There are the important continuous positive changes in small steps. But, there is sometimes organized internal resistance to change (Jeston & Nelis, 2008a, p. 56).
- **Explaining the process analysis:** Explaining the benefit of the mapping process to the process owners is very important. The owners are convinced of the benefit at the practical level after the mapping is finished. They themselves monitor continuously if the processes they are responsible for have been mapped in their current form.
- **Performance measuring:** Some process owners are worried about their work performance being measured. It is, however, only a description of the activities, which cannot be used to determine the employees' workload.
- **Improvements:** The process owners know their processes very well; therefore it is necessary to collect ideas for improvement. Jeston & Nelis (2008b, p. 10) wrote that improvement is about making the business processes more efficient and effective.
- **Black boxes:** People in the organization do not perceive some of the organizational units as "black boxes". The management system has become more transparent. Employees of the institution have read-only access to all the performed/planned processes.

2.2. Step 2 – What? (The area of process mapping)

Before the activities of process mapping, it must be determined what exactly will be mapped in the institution, thus the extent of the mapping. In the case of the first approach, (see step 5 – HOW?) usually the top management must specify organizational units – process owners in which data collecting is going to take place to map the actual state. Process beginnings and ends will be set within mapping of the organizational units and then during the process completion. In the case of the second approach (see step 5 – HOW?), the activities that are going to be mapped must be specified. The owners of the processes should specify the beginnings of the processes. The ends of the processes mapped will emerge during mapping and from the subsequent decisions of the relevant employees.

- **Scope of mapping:** For application to be suitable, the lists of the organizational units/processes/process owners must be approved by the top management of the institution.
- **Project manager:** The role of the person who collects the data from the process owners to determine the hierarchy of the processes mapped suitably and correctly is irreplaceable.

- **Diary of the meetings:** In a big institution, it is useful to keep a diary of the meetings with the process owners. It increases the level of transparency in the mapping process.

2.3. Step 3 – Who? (Who is going to manage mapping process and who is going to map the processes?)

The top management must first officially appoint a person who is going to be responsible for the process mapping the educational process. The appointed person must also develop competence to be able to achieve a goal. It is the person who will present the result of the mapping to the top management/to relevant persons involved in the operation of the institution. The person is in fact the coordinator/manager of the mapping process. Before the mapping begins, people who are going to map the processes must be appointed and trained.

- **People:** A suitable selection of people involved is essential. They should meet the key requirement of being able to obtain the maximum possible and necessary amount of information from the respondents. It is presumed as a must that the selected people will have the enthusiasm to gather information.
- **Time capacity of people:** Selected people must have sufficient time capacity for this task. Standard functional processes are usually mapped very quickly. During the mapping process, the process owners may change, which means that it is necessary to take into account the time needed for a potential process review. Mapping in the form of a dialogue with the process owners contributes significantly to the time efficiency of the work.

2.4. Step 4 – When? (The process mapping schedule)

Determining the schedule of data collection is essential for optimal usage time of all involved.

- **Time schedule:** For the process mapping it is useful to create a time schedule (depending on the size of the institution) that will show who and when is going to answer the questions asked by people carrying out the mapping. To create a schedule, it is useful to use the Gantt chart with further information added such as the persons responsible, notes etc. When the management of the meetings with the process owners is good, the purpose is quickly and efficiently achieved.

2.5. Step 5 – How? (Approaches to process mapping)

To make the mapping process practical, there are two approaches to process data collection that can be used. Each of these approaches has its advantages and disadvantages. The first approach includes process data collection by determined organizational units, i.e. meetings with the process owners are held in each selected organizational unit.

- **New information about processes:** A great advantage is that this unveils how particular activities on the defined levels of details are carried out in the institution. Subsequently, a large amount of information about the state of the processes will be available. A proper selection of the information is needed. Tapping, Luyster & Shuker (2002, p. 91) wrote that you must focus on the most accurate and useful information.
- **Composing of processes:** A disadvantage may be the subsequent complexity and disorder when there are many processes in creating/composing complete processes across different organizational units. Record, which should be systematic and complex, should be kept for every information.
- **Principles of mappings:** It should be mentioned that this approach is not in compliance with mapping principles because, theoretically, the methodically right procedure is to map by processes. On the other hand, in practice, this is the only way to discover what is happening in the institution.

The second approach includes direct mapping of each activity selected. Basically, some processes are selected and then mapped from their given beginnings through the corresponding organizational units to their given ends. This mapping is carried out along the process line of activities.

- **Effectiveness of mapping:** The advantage of this second approach is time and costs saving as only selected processes are mapped, ignoring the information on what works and what does not.
- **Lack of process information:** There are, however, the following potential risks: lack of process information about the actual development/state of the processes, influencing the process flow and ignorance of informal information about the state of the processes/institution.

2.6. Step 6 – Terminology (Technical terminology)

The mapping process is part of quality management; therefore technical terminology is used. It was created to clearly define individual terms and also for experts/people involved to be able to communicate with each other, using international terminology.

- **Language of communication:** The mapping process is usually carried out across the institution and people with different experiences of using technical terminology are involved which is why the language of communication must be properly defined. Follow some examples: customer, product, process output, etc. It is important to continuously explain the technical terminology of quality management using suitable examples during the mapping process, i.e. some process owners could not understand the difference between the technical terms of output and product.

2.7. Step 7 – Tools (Realization with supporting methodological tools)

“*The 10 Steps of the Mapping Process manual*” is a general manual; therefore it can be applied in all tertiary institutions. It represents only one of many possible ways to achieve the desired goal – to have processes mapped. All the supporting charts and figures in the manual are only general. They must always be adjusted to the specific needs of an institution. They cannot be considered perfect and 100% applicable in all institutions in this form. The institutions must always customize the mapping process.

The following phase includes arranging and holding individual meetings with the process owners. At the beginning of each meeting with the process owner(s) it is always necessary to explain the purpose of mapping, what benefits the result of the mapping process brings and what in particular it means to the employee. It is suitable to inform the owners that the process mapping has been approved and supported by the top management of the institution.

The person carrying out the mapping must ask suitable questions to obtain complex information about the processes. Follow an example of process information which can be obtained for data collection:

- *Process type:* Whether a process is main, controlling or supporting;
- *Academic management:* Person from the top management responsible for the process;

- *Organizational unit, Sub-organizational unit*: Specific organizational structure (e.g. department, unit, division, group, etc.);
 - *Process number*: Process identification number, if any;
 - *Process name*:
 - *Naming activities*;
 - *Name – sub-processes*: Name of an activity, if any, that is one hierarchical level lower;
 - *Process owner*: The person who is responsible for the processes/results and who also carries them out (singular/plural);
 - *Customers*: The person who receives the result of the process (singular/plural);
 - *Product*: What is the result of the process;
 - *Outcomes*: Specification of the process output parameters;
 - *Suppliers*: The person or organization providing the product;
 - *Input*: Specification of the process input parameters;
 - *Documentation*: Assigning possible key documentation defining the controlling conditions of the process;
 - *Documentation accessibility*: The officially specified repository of the document;
 - *External customer*: An external person (usually not an employee of the institution), receiving the result (singular/plural);
 - *Date of revision*: The date of the last data update;
 - *Link to a process*: If a process has been mapped in greater detail (e.g. block diagram, integrated development diagram, etc.), there is a possibility of electronic interconnection (e.g. via a hypertext link, sharing data via software in the institution, etc.);
 - *Recommended process description*: Here it can be entered, if the process is to be mapped in greater detail in the future (e.g. block diagram, integrated development diagram, etc.);
 - *Process identification by ISO 9001*: Possible assignment of the corresponding chapter from the ISO 9001 standard to the process mapped;
 - *Hierarchical level of the process*: Assigning the hierarchical level to the process in the institution;
 - *Notes*: Here one can add notes/comments about the process mapped.
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- **Color logic of process**: It is convenient to use the following highlight colors, during the process mapping to highlight according to the following color logic, but only for the field *Process name*. It must be stressed that this logic is only recommended and is necessary when it is

applied to the appropriate manner modified. The legend of color logic is as follows: *Green* – The process is functional and fulfils the desired purpose; *Red* – The process is not being performed at the moment; *Pink* – It is not clear who is responsible for the process; *Orange* – The process owner performs the process but it does not make logical sense; *Yellow* – The process owner is responsible for the process but does not perform it; *Blue* – The process will normally work in the future; currently it is being defined in terms of processes and systems; *Purple* – A process that should ideally be performed but is currently not; and other colors as needed. Again, it must be understood that this logic is only recommended. For each application it is necessary to modify it in an appropriate manner.

- **Records of information:** At the first meeting, the person in charge must ask suitable questions (using the suitable records for saving information about processes) to find out what is being done noting down the information in records, processing it at follow-up meeting(s), and having its final form approved (at the time of the mapping). The same procedure is used with all the approving managers from the lowest to the highest management levels. The information gained must be recorded with specific details. For example, it is not possible to write that something is regulated by a law. The exact name and identification including the issue/expiry date must be given.
- **Graphic form:** Information about the processes only provides a review of what processes there are in the organization's units. A process is of course a set of interrelated activities affecting each other which is why it is necessary to have it suitably described, preferably in a graphic form, where it brings value. The graphic description depends on the tool used (e.g. a block diagram, integrated development diagram etc.) and on the capabilities of the institution (the current software, finances, etc.). Carkenord (2008, p. 255) wrote that depending on the particular type of requirement, a visual or graphical representation of a requirement may be easier to review and approve than a textual description. Generally, the depth of the mapping process should reach such an extent so as to provide a clear added value to the processes mapped. Jenston & Nelis (2008b, p. 201) wrote that the devil is in the detail. It means that the institution must always justify the need for the specific way in which the processes have been mapped.
- **Teamwork:** It is interesting how much more information is gained when approving the activities in a group. This way also significantly improves the level of communication/responsibility for activities in the institution.
- **Organizational structure:** The processes mapped are used to verify the current organizational structure of the institution. It often does not

correspond with the reality discovered during the interviews with the selected people.

2.8. Step 8 – Data (Process completion)

After obtaining all the necessary information from the selected people there is a large number of tables and the graphic records of the processes. In this case, an analysis and completion of the materials gained must follow. The result is a processed, well-arranged map of processes which logically follows the lower hierarchical levels of the processes mapped. This map of processes can be created using the process information, where the Process name and the Name - subprocesses fields are used from which relationships between processes in a well-arranged Process map are established. A process map shows a general example of a map of processes. This process map shows a diagram at the highest hierarchical management level. If needed, this process map can of course be applied at other hierarchical levels meeting the needs of the institution. For this purpose, well-arranged block diagrams can also be used.

The process map shows the process flow and relationships in the institution from the top hierarchical view. The example of generic process map visualization generally includes the following process groups: controlling, main and supporting. Each institution can use this general map but it has to be processed specifically based on the information gained in the mapping process including the logical identification of processes/subprocesses.

- **Process map:** The process map must correspond to the current state of the processes in the institution. To get information in perspective, it is necessary to have the right data of summaries described. Conger (2011, p. 103) wrote that when a team is developing process maps, it becomes clear that summaries are needed.
- **Strategy and goals:** It was found how the intentions of the institution concerning the strategy and goals break down into single organizational units/processes.

2.9. Step 9 – Feedback (Feedback)

Feedback can generally be divided into two categories. The first category includes receiving feedback on activities/functioning of the institution from respondents questioned when information about the processes is being collected. The second category includes information from the performed mapping procedure, i.e. it is feedback on the methodical procedure.

2.10. Step 10 - Continuous Improvement (Continuous improvement and data sustainability)

The mapping process presents a large number of findings about the institution. However, this step is primarily about setting the rules for administration, updating and using the information about the processes. Each institution should specify who will be in charge of this and how this information will be used for sustainability and continual improvement of the institution.

There is a need to emphasize that mapping processes is not only a formal requirement. It is a very important for self-knowledge of an institution. This is crucial for long-term success of any institution. Mapped processes must live "on-line" with the institution, and therefore must be archived on the recording medium in the actual form. We often hear about increasing levels of management, competitiveness and needs of innovative approaches, but the question is whether it is true for considered institutions, as well? Information about the processes provides a unique opportunity for using own self-knowledge (processes information) and the skills of an institution's own employees for its long-term success. Dew & McGowan (2004, p 15) wrote that the continuous improvement journey engages people in learning about their organization.

- **Live with the institution:** The processes mapped must "live with the institution". This means that there must be a person responsible for administering the process data updating.
- **Information system:** An inseparable part of each institution is their information system. There are immense numbers of software products intended as support of process mapping. The clear recommendation is using the current software capabilities of the institution. What has been mapped has been used; it means that information for the mapping was not doubled. This was mainly about unifying the visual form of the process treatment within the institution.
- **Quality culture:** Extending the quality culture in the institution.

3. COMMENTS ON THE EXPERIENCE FROM PROCESS MAPPING

The ten steps of the mapping process manual was written because there was a need for a general manual for people who needed to find out/describe the activities performed in the educational institution. Another goal was also to use it for to identify processes needed to meet the requirements of the ISO 9001 standard. Based on this need, a general procedure for users was developed – the ten steps of the mapping process manual for tertiary institutions. After selected employees are

trained, it can be used for process mapping. The manual was tested on 27 organizational university units and adjusted, based on this experience. Process mapping was attended by about 280 employees. Based on the findings mentioned in the previous section, the ten steps of the mapping process manual were modified. The emphasis was put primarily on the comprehensibility of use and simple, general, and clear arrangement of the following steps. The feedback was put in 34 categories, which were re-assigned to the ten steps of the Procedural Manual. Feedback from the survey taken among stakeholders in the process of mapping was quantified to the three groups: feedback from management institutions (top and middle management), from participating staff and the persons who mapped the process data.

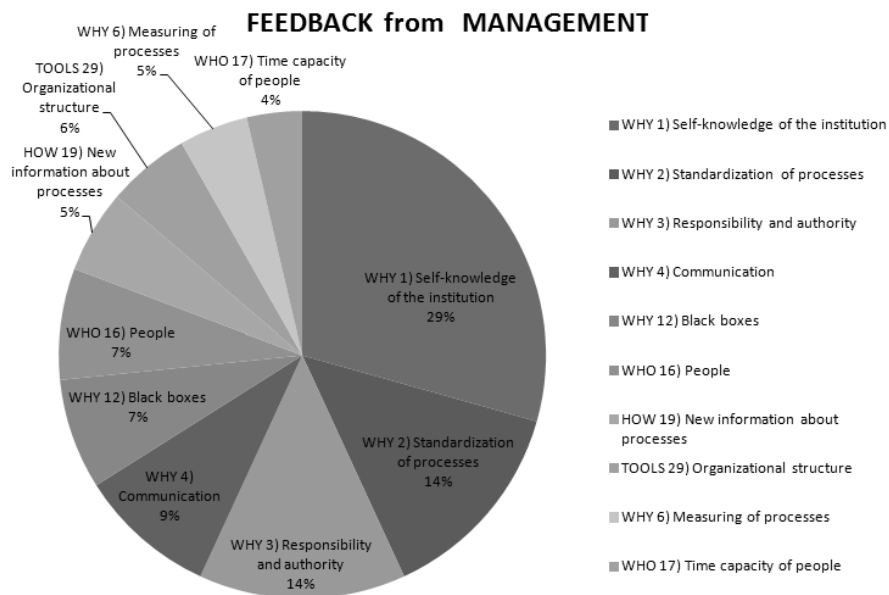


Figure 2. Feedback from management

The graph implies that for top and middle management is the most important is self-knowledge of the organization, standardization of processes and clear identification of responsibilities and authority. For staff it is increasing the level of communication, fear of measurement work performance and explaining the benefits of process mapping. The proper selection of people for data collection is critical according to the replies of the persons who mapped the processes data. The people for mapping process must be communicative, must be enthusiastic to gather information and the respondents must have confidence in them. The proper

explanation of the benefits of the process mapping is the same as in the category *feedback from staff*.

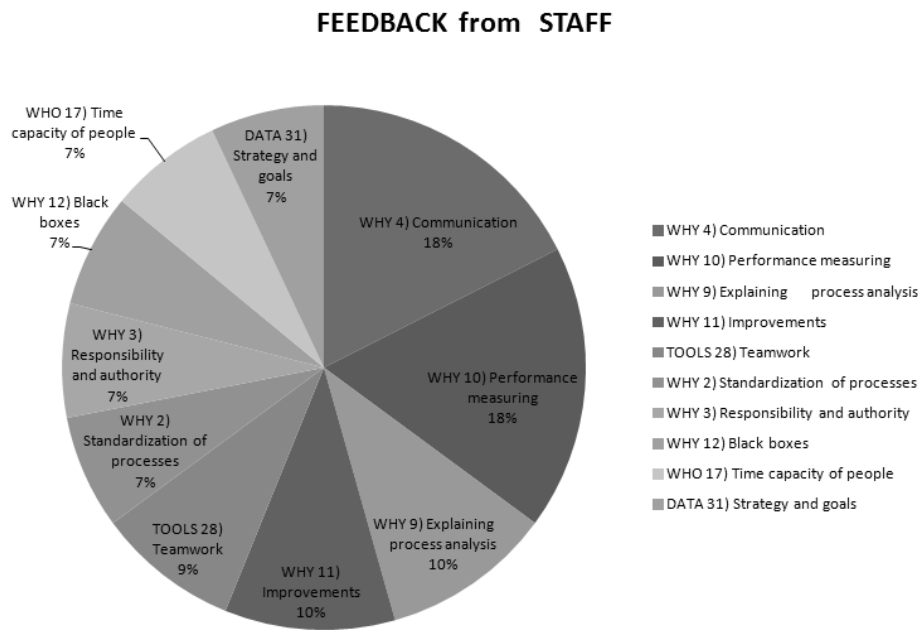


Figure 3. Feedback from staff

Based on the findings, a more detailed analysis for items *self-knowledge of the institution*, *communication* and *people* was carried:

- *Self-knowledge of the institution* - It is very interesting that the level of details of mapped data in the modeled processes on the Czech universities is rather low. It is known what processes are contained in institutions, but there are not enough well described outcomes of process activities. Another motivation is the accurate identification of competencies, i.e. responsibilities and authorities.
- *Communication*: Feedback from employees clearly showed a lack of continuity of communication of information from the top management to the lower hierarchical levels. A personal communication in the communication of information between senior management and employees is missing.

FEEDBACK from PERSONs who mapped the processes data

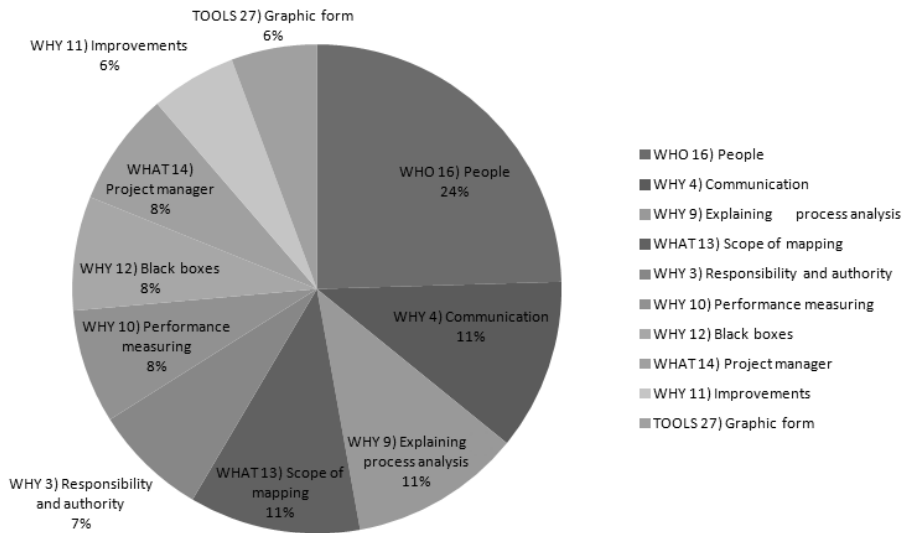


Figure 4. Feedback from persons who mapped the processes data

- *People*: There is a clear that drive for mapping processes. People's interest about the institution is a pivotal. In addition, it is a general the quality management system. This result also reflects the interest in a transparent and fair system in organizations.

4. CONCLUSION

It must be stressed that the process manual only offers support for one of many possible ways of achieving the goal successfully. The advantage of the manual is that it is generic; it emphasizes free application, supports the participants' creativity and most importantly: it respects the originality of each educational institution. Its disadvantage is that it uses specialized technical terminology, which may be a source of potential communication problems without proper training. However, it must not be forgotten that the mapping educational process is after all a specialized technical activity. Based on the above mentioned, it is only possible to provide a general procedure with general tools. Each educational institution has its own specific tradition, conventions, specialization, and autonomous decision making processes.

Therefore, it is impossible to create a perfect manual that would be 100% acceptable by all tertiary institutions. Process mapping is an activity requiring creative thinking and careful decision making in performing, recording and updating the information. Nobody should expect that everything can be mapped using only a mechanical procedure without creative logical thinking. Let us not forget that the persons performing this process are irreplaceable. Their experience and right decision making is essential for the processes to be mapped in a way suitable for the institution. Of course, the mapping process is not free of cost in the institution. The process of the mapping must be realized adequately. Educational institutions perform the mapping process primarily for themselves (self-knowledge) to use it for improving on their way to achieving excellent management.

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**POVRATNE INFORMACIJE NA TEMELJU PRIMJENE PRIRUČNIKA ZA
PROCEDURU MAPIRANJA OBRAZOVANIH PROCESA U INSTITUCIJAMA
TERCIJARNOG OBRAZOVANJA**

Sažetak

Zbog stalnog smanjenja finansijskih sredstava, menadžment mora pronaći načine za osiguravanje kvalitete u institucijama tercijarnog obrazovanja, i to uz optimalne troškove. Ovaj se cilj može postići jedino kontrolom kvalitete obrazovnog procesa, čiji su zahtjevi dio standarda ISO 9001. Među njima je i mapiranje obrazovnih procesa u okviru sustava osiguranja kvalitete. Za tu je svrhu izrađen praktični priručnik, koji pruža informacije o poznavanju vlastite institucije. U ovom se radu prezentiraju povratne informacije iz praktične primjene priručnika za proceduru mapiranja obrazovnih procesa u instituciji tercijarnog obrazovanja.