# Using Structural Coupling Approach for Defining and Maintaining Identity of an Educational Institution. Experience Report

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**Abstract.** This paper presents an ongoing study on defining and maintaining organizational identity of an institution of higher education, such as a department or school. The theoretical background used in the study is the concept of structural coupling that comes from biological cybernetics. The study concerns the authors own department. The paper presents proposals of to which elements of the environment such an institution is structurally coupled and how the identity maintenance is arranged. The paper provides examples of how maintaining identity works or not works in practice based on reflections on the authors' experience of working in their own department. It also shows that maintaining identity may requires changes in different components of the socio-technical system, e.g. methods, people, technology.

**Keywords:** Strategy, policy, organizational identity, viable system model, VSM, structural coupling, socio-technical



## 1 Introduction

Maintaining organizational identity belongs to the vital functions of an enterprise/organization. In Viable Systems Model (VSM) [1], this function is entrusted to the highest-level management system called System 5. Dependent on the author, System 5 is called *Identity management* function, as in [2], or *Policy management* function [3] (meaning that policies are aimed at identity management). Identity is also present implicitly or explicitly in all levels of strategy work, as defined in [4]:

1. Doctrine or policy, which defines who we are.
2. Infrastructure/capability, which defines what infrastructure/technology we should use in our business, and what capabilities we need to develop.
3. Grand strategy, which defines in which sector to operate and with whom to make alliances.
4. Strategy, which defines our structural coupling with the external world, e.g. competitors, collaborators, markets. The questions to decide here are whether we are a heard leader, part of a heard, an independent, etc.

Though maintaining identity is a function of the organization itself, the identity as such, is what an external observer sees, not what the organization defines on its own, which creates a paradox [2]. Also, the identity exists independently whether it is explicitly known to and maintained by the organization. Managing identity without really knowing it may be disastrous for the organization [5], thus understanding own identity, i.e. how we are seen by the others, should precede any active actions related to identity maintenance. This understanding is also needed for planning any radical change aimed at changing the organizational identity, as such change needs to be visible beyond the organizational boundary.

In this paper, we are looking into how to define organizational identity of an institution of the higher education, such as a department, school, or faculty in a university. The goal of the investigation is to create a kind of practical model that would help an institution to make informed decisions on how to maintain its identity. The model should be possible to use retrospectively for analyzing the decisions related to maintaining identity made in the past, and proactively - to make decisions aimed at maintaining or changing the identity.

The literature on organizational identity in the field of Management is vast, starting with a seminal work [6] from 1985, revisited in [7] by one of its authors in 2006. Among these works, plenty are devoted to identity of a university; for example, literature review [8] considers 120 peer reviewed publications in this area. Though the works on identity from the Management field give many insights about the organizational identity, we have not found in them a ready-made model that could be used for the practical purpose as discussed above. Reviewing articles on identity from the systems theory perspective, especially related to VSM and its System 5, we have chosen to test an approach suggested in [5]. This approach is based on the idea that maintaining identity is equal to maintaining structural coupling to the key elements of the environment in which the organization operates. The idea, in its own turn, is inspired by works from biological cybernetics [9].

In this paper, we identify the elements of the environment to which an educational institution is coupled, such as: *High school* (called "Gymnasium" in Sweden), *Industry*, *University* to which the institution belongs etc., and give examples of changes in the structural coupled elements that resulted in changes introduced in the institution itself. Changes can concern various components of the institution's socio-technical system, for example, some concern *teaching methods*, other concern *technology*, etc.

Most of the examples presented in this paper are related to the institution to which both authors belong. Both positive and negative examples are presented; to the latter belong the ones where ignoring one of the structurally coupled elements leads to dangerous consequences.

The rest of the paper is structured in the following way. In Section 2, we give an overview of the research approach and knowledge base that underlines our work. In Section 3, we present a simple model of the university institution and elements of its environment to which it is coupled. In Section 4, we present analysis of decision made and implemented by an educational institution in order to maintain its structural couplings, most of the examples comes from the authors own department. In section 5, we summarize the results of our work and draw plans for the future.

# 2 The Research Approach and Knowledge Base

## 2.1 Testing a hypothesis

This work could be considered as testing a hypothesis that the idea of using structural coupling for identifying and maintaining identity from [5] could be applied to an institution of higher education, such as a department, faculty or a school of a university. The goal is to create a model that can help in analyzing past decisions related to maintaining the organizational identity, and could be used for making informed decisions in the future.

Though [5] presents a number of examples of using structural coupling for understanding and solving identity problems, none of them concerns an educational institution. In addition, as far as we know, no other research paper describes application of this concept to the task of modeling and maintaining the identity of such an institution. Note, however, that there are a number of approaches in the literature mentioned in [8] that use similar ideas to the ones used in the approach based on structural coupling. To these, for example, belong Stakeholders approach [10], and Institutional logic [11]. However, none of them totally coincides with the view on the identity based on structural coupling, and none of them is rooted in systems theory, in general, and VSM, in particular.

Based on the deliberation above, we can conclude that there is a knowledge gap related to whether the approach to modeling and maintaining identity based on structural coupling could be used for creating a practical model for an institution of higher education. This paper is meant to fill, at least partly, this gap.

## 2.2 Viable System Model (VSM)

As this work is, at least partially, based on VSM, we give a short overview of this model. VSM has been developed by Stafford Beer [1] and his colleagues and follows, see for example [3,12]. VSM represents an organization as a system functioning in its environment and consisting of two parts: *Operation* and *Management*. In its own turn, *Operation* is split into a number of semiautonomous operational units, denoted as System 1, that have some communication mechanism to ensure their coordination. The latter is denoted as System 2. *Management*, in turn, is split in three parts, denoted as System 3, System 4, and system 5, which is presented in Fig. 1. Dependent on the author, these systems may be dubbed differently, see Table 1, but they have more or less the same meaning, see the last column of Table 1.

Note that components listed in Table 1 seldom coincide with the organizational structure of a particular organization. Different components can be manned by the same people. This, for example, happens in a small enterprise where the same group of people does the job on all levels. The components in this case are differentiated not by who is doing the job, but by the nature of activities performed, e.g. policy document writing belongs to System 5, while completing a customer order belongs to System 1.

VSM has a recursive nature, meaning that any unit of System 1 can be considered as a viable system on its own; thus it can be represented with the help of VSM, as shown

 

in Fig. 1. Note also, that besides 5 systems presented in the table, there is a so-called system 3* that consists of random inspection of System 1 by System 3 of the same, or higher level.

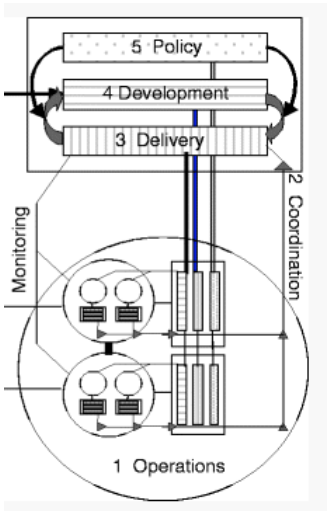


**Fig. 1.** VSM model, adapted from [12]

**Table 1.** Components of VSM

| **Identifi-cation** | **Naming** | **Function** |
|---|---|---|
| System 1 | Operations, Implementation, Delivery | Producing and delivering products and services for external customers, thus actively interacting with the environment |
| System 2 | Coordination | Coordinate work of operational units included in System 1. |
| System 3 | Control, Delivery management [2], Cohesion [3], Homeostasis [13] | Managing operational units (System 1), and establishing/maintaining coordination mechanism (System 2). Making the semiautonomous units function well as a whole (cohesion) in the current business environment (homeostasis). |
| System 4 | Intelligence [3], Future, Heterostasis [13] Development [12] | Forward looking adaptation to possible future changes in the environment through identifying trends and preparing to changes or affecting the environment in the desired direction (intelligence). System 4 allows changing from one homeostasis (now) till possible homeostasis in the future thus allowing the system to function in a heterostatic environment. System 4 is considered as including development, marketing and research. |

| Identifi-cation | Naming | Function |
|---|---|---|
| System 5 | Identity [13] (management), Policy [3,12] (management) | Solving conflicts between System 4 and System 3 [2]. Permitting System 4 to introduce changes despite the conservatism of System 3, and not allowing System 4 to change the identity of the whole system that exists via functioning of Systems 3, 2, 1. This is done through designing, maintaining and imposing policies that stay in place even when changes designed by System 4 are implemented in Systems 3, 2, 1. |

### 2.3 Structural coupling

According to [5], there are two ways of investigating organizational identity. One way is starting from the inside, e.g. looking on the mission and vision statements. The other way is starting from outside, i.e. looking on how external observers see the organization. The second way is rooted in POSWID principle, where POSWID stays for "the Purpose Of a System Is What It Does", which is especially useful when there is a risk that the internal vision does not coincide with the outside view. The idea of using structural coupling for modeling and maintaining identity from [5] is related to the second way of investigating and modeling identity. The primary focus here is on the connection between the system and its environment, rather than on the internal structure of the socio-technical system (organization). This focus does not mean that the internal structure of the socio-technical system (organization), e.g. culture, methods and technology, is not relevant for identity. It is important for the decision-making regarding maintaining identity, but the needs for the decisions themselves more often come from the changes in the external environment, rather than from the internal stimulus.

The idea of structural coupling is relatively simple. There are elements of the environment that are more tightly connected to the given system (organization) than other parts of the system's environment. The system focuses on reacting on changes in these elements or/and trying to change them, while more or less ignoring other elements (systems) in the environment. According to [14], a system deliberately chooses to limit its coupling to few elements, as a strategy of dealing with the complexity. These elements, in turn, function as information channels to other parts of the environment.

Moreover, the structurally coupled systems change together, one changing itself as a reaction on changes in the other. The coupling might not be symmetrical, i.e. one system may dominate the other, making it more likely that the latter would change as a reaction on changes in the former, than vice versa.

Note that maintaining structural coupling to the given set of environmental systems does not exclude that the system cannot change to what it is structurally coupled. Such changes may be more or less radicle. In a less radicle change, one structural coupling is substituted to another of the same sort. In a more radicle change, the nature of

 

coupling, or the types of the coupled systems changes. The latter may be considered as identity change. In this paper, however, we do not consider this kind of changes.

### 2.4 Research approach

In this paper, we do not try to build a generic model for identity management of any institution of higher education. We rather limit ourselves in building a model for a particular institution, namely, our own Department of Computer and Systems Sciences, abbreviated as DSV (abbreviation refers to the Swedish name), at Stockholm University. Extending the model to become a generic model for any institution is outside our current goal; however, we believe that the approach we have taken can be applied to building identity models for other institutions as well.

The model is built by analyzing the DSV environment, identifying most important elements in it, and analyzing the nature of relationships between DSV and these elements. Based on this analysis, we define objectives/goals of maintaining identity against each of the structurally coupled elements. The main source for building a model is the authors' knowledge and experience of being part of DSV for many years.

At the next step, the model is tested in one way. Namely, it is used for analyzing past decisions made by DSV that are related to identity management.

## 3 Building an Identity Model

### 3.1 Short description of DSV

Our study is being completed in the Department of Computer and System Sciences, abbreviated to DSV, at Stockholm University. The department is engaged in research and undergraduate and graduate teaching of about 5000 students simultaneously. It runs bachelor, master, and doctoral programs in the fields of Computer Science and Information Systems. It has about 180 staff members including teachers and administrative staff. The department belongs to the Faculty of Social Sciences, which is unusual for departments of the DSV type in other universities. Usually, such departments belong to the engineering, hard science, or business schools. Both authors of this paper belong to the DSV academic staff.

In this paper, we consider only teaching activity of DSV, leaving the research activity outside the scope of our study. More specifically, we concentrate on bachelor and master programs of the department, leaving PhD programs, which are relatively small, outside.

In Sweden, university education is free of charge for citizen and residents of EU, which constitute the majority of our students. Other students need to pay some fee, but the fee is small when comparing with other countries. Formally, Stockholm University is a governmental institution.

### 3.2 Identifying structurally coupled elements

When identifying the structurally coupling elements, we have followed a simple set of rules summarized in Table 2. The first two rows are based on the view on a system as a device that converts its inputs into outputs. The third row is based on VSM and its recursive nature. The fourth row is based on a system having a position in the physical world.

**Table 2.** Guidelines for identifying structurally coupled elements

| Concept | Rule |
|---|---|
| Input | Identify essential for the system inputs. Find out the systems that produce these inputs. These, potentially, are structurally coupled elements of the system's environment. |
| Output | Identify system's outputs, even unintended ones, like waste produced during the operations (see the example of the atomic industry in [5]). Identify the systems that consume (voluntary or involuntary) the outputs. These, potentially, are structurally coupled elements of the system's environment. |
| VSM | Identify systems of which the organization in focus is a part, i.e. a semi-autonomous System 1 unit. This can be done for several level of recursive decomposition of the upper system(s). Identify the management subsystems (System 3) of these upper systems. These, potentially, are structurally coupled elements of the system's environment. |
| Location | Identify physical location of the organization in focus. The system in focus might be structurally coupled to the location. This is not always true, e.g. not for a virtual enterprise. |

The main input to DSV is the students becoming enrolled in the DSV programs. They are produced by other educational institutions. For the bachelor DSV programs, the enrolled students are produced by high school, mostly the Swedish one (called “Gymnasium” in Sweden); for the master programs, the enrolled students are produced by bachelor programs of the universities all over the world. The latter includes DSV itself, though the percentage of own graduates from the bachelor programs who enroll in MS programs is not high. We refer to all producers of the potential DSV students as ***Lower-Level Educational System*** (LLES). Obviously, DSV is structurally coupled to LLES, and should react on changes in the latter, e.g. changes in the quantity of potential students produced, or their level of academic preparedness.

The main output of DSV is graduated students. These are consumed, i.e. employed, by the industry, public sector and non-for-profit organizations who need specialists in computer and systems sciences. We will refer to all potential "consumers" of our students as ***Employment System*** (ES). Obviously, DSV is structurally coupled to ES, and need to react on the changes in the latter, e.g. changes in the size, or skill requirements.

 

The next step is to identify structurally coupled elements that are related to the position of DSV in VSM systems to which it belongs, directly and indirectly. As a department of Stockholm University, DSV constitutes a semiautonomous System 1 unit of the university; it is being managed by the university management system, which includes its System 3,4,5. We will refer to this management system as ***University Management System*** (UMS). Being part of the university, DSV is structurally coupled to UMS; it receives from it the quotas on the overall number of students to teach and financial compensation for teaching activities. Changes that affect the university as the whole, e.g. a diminishing compensation received from the Swedish state will be passed to DSV. The latter might need to react on them by diminishing its teaching staff and/or finding other means to operate inside the lesser budget.

Stockholm University on its own can be considered as a System 1 unit of the Swedish higher education system, which has its own management system. We will refer to this management system as ***State Higher Education Management System*** (SHEMS). SHEMS includes public offices related to higher education, the most important of which is Swedish Higher Education Authority [15], which is responsible for the quality of the Swedish higher education. As the management of the upper level, SHEMS can conduct random inspections of the universities' departments, more or less, bypassing UMS (see an example in Section 4.2), which corresponds to the action of System 3* of VSM.

As the last step for identifying structurally coupled elements of the DSV environment, we consider that the major part of educational activities at DSV is on-campus teaching. That makes DSV structurally coupled to its geographical location, more exactly to ***Stockholm Municipality*** (SM). SM is to provide DSV with possibility to have campus offices, and students and staff with housing and relaxation facilities.

As the result of the analysis of the DSV environment presented above, five structurally coupled elements of the environment has been identified: LLES, ES, UMS, SHEMS and SM, which are represented in Fig. 2.

### 3.3 Identity maintenance goals

In this section, we will analyze in more details relationships between DSV and each of the structurally coupled element of its environment, and discuss the goals/objectives of identity management for each of these elements.

1. *Lower Level Educational System (LLES).* In order to survive and prosper DSV needs to have enough enrolled students with sufficient level of academic preparedness to be able to finish their education. The critical factor here is to fill the educational quotas given by UMS to get enough funding to retain the existing teaching staff and facilities. The objective/goal here is to be "attractive enough for the graduates of LLES that have qualifications to finish their education". Examples of how this goal has been achieved in case of the environmental changes are presented in Section 4.
2. *Employment System (ES).* The number of students enrolled into DSV program depends on the graduates being "employable" by ES. There is a positive feedback loop between the employability and enrollment. If many of the graduates cannot find

a job, the information eventually will find its way to the LLES graduates and they may choose another institution for their study. The other way around, high employment rate of DSV graduates may positively affect the enrollment. The goal of maintaining identity here is to produce employable graduates. As there are plenty of employment opportunities in IT-related areas, satisfying this goal is not exceptionally difficult, at least for the moment. It is enough to have the graduates who have enough qualifications to be quickly introduced in the junior job positions or be employed as trainees.

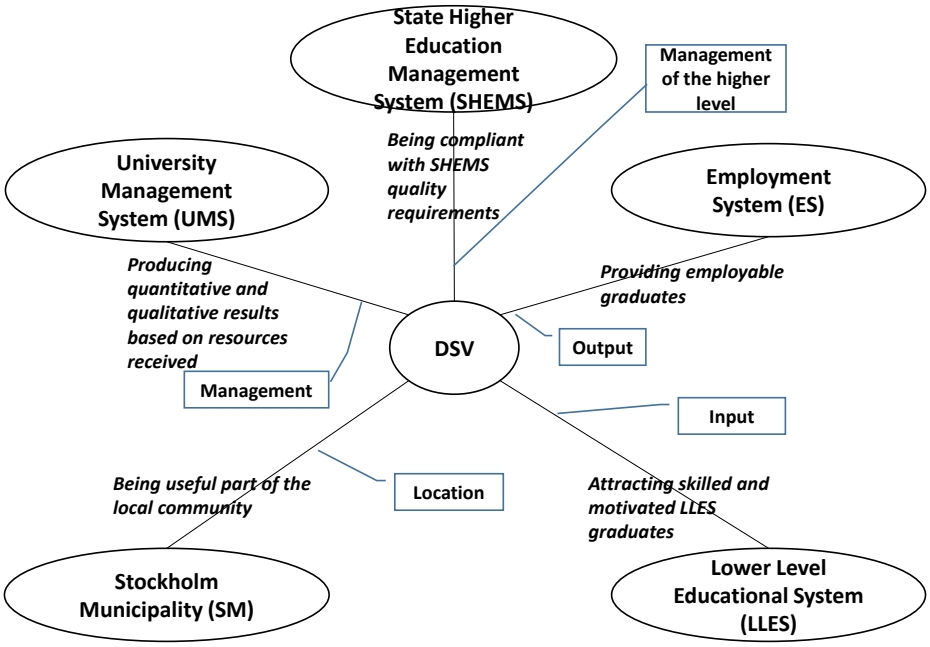


**Fig. 2.** DSV structural coupling. Text on the edges shows goals in respect to each element of structural coupling. Text in boxes shows the nature of relationships

3. *University Management System (UMS)*. UMS provides resources for DSV functioning and requires that the resources are used efficiently, producing the quantitative (e.g. the number of enrolled, and graduating students) and qualitative (e.g. high-level examination grades) results. UMS may also demand the education being held in a certain form, e.g. on-campus (versus on-line), having two stages bachelor/master education etc. The goal of maintaining identity here is producing the desired results in the frame of the allocated budget. Achieving this goal may help in getting bigger quotas, and financing for temporal difficulties or long-term investments.
4. *State Higher Education Management System (SHEMS)*. SHEMS most important function is to ensure compliance with state policies regarding higher education. SHEMS can conduct inspections of universities' departments and decide on decertification of certain programs if it finds low quality or noncompliance. An

 

example of such kind is discussed in Section 4.2. The goal of maintaining identity here is to be compliant and produce the required quality (at least formally). Achieving this goal may help to avoid repeating inspections. The best result here is not to be "bothered" by SHEMS.

5. *Stockholm municipality (SM)*. In difference from the structurally coupled elements as above, this coupling is physical not virtual. It exists as long as the education is campus-based and the campus is situated in Stockholm. DSV does not need to do much to maintain this coupling. Some activities related to this structural coupling are completed, though, for example, action directed at convincing municipality to provide more and cheaper housing for the enrolled students.

## 4 Using the identity model for analyzing past activities

In this section, we analyze past decisions taken by DSV that are related to identity management. The cases represent identity management in relation to all structurally coupled elements of the environment: LLES, EM, UMS, SHEMS and SM. The cases are summarized in Table 3 that shows which structural coupling each case concerns (second column), and which parts of the DSV socio-technical system have been primarily affected by the change (third column). Note that affected parts listed in the third column reflect only the primary objective of change; other parts were adjusted to this change as well.

**Table 3.** Summary of cases

| **Case name** | **Structural coupling** | **Affected parts** |
|---|---|---|
| Introducing international MS programs | LLES | Technical (methods): changing teaching language to English |
| Introduction of a new process for BS and MS theses courses | SHEMS | Social and technical. A new process established with a set of responsibilities defined for different groups of academic staff. People trained to work differently. New technology (system) introduced |
| Dealing with decreasing levels of students' academic preparedness | LLES | Technical – changing teaching methods and utilizing new technology |
| Introducing Bologna Process recommendations | UMS<br>ES | Technical – reducing the number of courses, while remaining relevant to ES |
| Introducing distance MS programs | SM | Technical – changing teaching methods and using new technology |

### 4.1 Introducing international MS programs

This story concerns structural coupling between DSV and LLES, and it is related to introduction of international MS programs - taught in English - at DSV at the end of 1990th - beginning of 2000. Two aspects characterized the Swedish situation in this period:

- IT related boom that "sucked" many potential students to the industry. Students that started DSV programs were leaving as the industry offered them employment with quite high wages without demanding much education and skills.
- A demographic dip at the edge of 19 among high school students – the graduation age of Swedish Gymnasium.

As the result, the enrollment of students decreased, and DSV faced the dilemma: to decrease its academic staff, or find another way to attract enough students to increase the enrollment. The solution taken was to attract students that were hindered to be enrolled before, namely international students in general, and from the developing countries in particular. Before that point in time, all education at DSV was carried out in the Swedish language. An international student needed to spend one year for studying Swedish to be able to enroll. Also, at that time, the education was free for everyone, independently of nationality and/or place of residence.

Introducing the international MS program was not difficult, as:

- Practically all DSV courses used English reading books and articles, there were no need to search for different reading material
- Practically all academic staff could communicate in academic English without hindrance

Thus, the change did not require hiring new staff, or any special training of the existing staff. The changed to English in MS courses remained at DSV from this period. However, the enrollment of international students from the developing countries, like India, China, Pakistan, while substantial in the beginning, greatly diminished at around 2012, when the Swedish government introduced fees for the students coming outside EU. By that time, however, the demographic dip has planned out, and IT boom went through bust, which returned the students who left their education back to school.

### 4.2 Introduction of a new process for BS and MS theses courses

This story concerns structural coupling between DSV and SHEMS, or rather forgetting the importance of this coupling. In 2011, Swedish Authority of Higher Education (part of SHEMS) completed an inspection of DSV educational activity. The goal of the inspection was checking the quality of the education. In the past, such a commission looked at the educational processes as such. This time, the commission had chosen to look only at the results of the thesis process. A number of theses where chosen in an arbitrary manner and read by the members of the commission. Unfortunately, the thesis they had chosen were of low quality. In short, the theses that the commission analyzed had neither proper structure, no much of content in terms of scientific contribution.

 

The commission produced a report with a severe critique and demanded immediate actions threatening to close some of the DSV programs. The information went to mass media threatening to undermine the reputation of DSV. The DSV management tried to counter this information with the stories of high employability of the DSV graduates. The stories were true, but have no effect on the commission, as SHEMS is responsible only for the quality of education (as they understand it), not for the employability of the students; the latter is the matter for DSV itself to solve.

In short, not paying enough attention to SHEMS as structurally coupled element of the DSV environment led to an existential threat to DSV, comparable to the one of atom industry described in [5]. The threat required a prompt reaction; therefore, the improvement process was hastily started to increase the quality of the thesis. The changes introduced via this improvement process concerned all components of the socio-technical system related to the thesis courses, including new technology, staff training, and new distribution of responsibilities. The process, though not totally finished, gave results; the quality of the theses was improved, and the existential threat averted. More details on the topic see in [16].

### 4.3 Dealing with decreasing levels of students' academic preparedness

The academic level of enrolled students in DSV programs gradually declined over the last 20year. This is a known phenomenon observed by other universities in Sweden, and other places. This phenomenon is described in details in [17]. A university needs to deal with this phenomenon in one way or another; otherwise, a great number of enrolled students will never finish their education.

Different institutions deal with this problem differently. For example, our colleagues in Swedish Royal Institute of Technology have chosen to introduce as so-called "basic year" where the prospective students get the knowledge that they need to study an engineering program. This allowed not to introduce radical changes in the engineering programs as such. So far, DSV has not used this method of maintaining structural coupling to LLES. Instead, the way of teaching has been gradually changed. Instead of relying on academic preparedness of the students, teaching started to rely on connecting the material to practical application and training.

Changing of the teaching methods, can be demonstrated on the example of the course *Introduction to Databases* (DB) given to the first or second year bachelor students, for which the first author has served as a teacher during the last 5 years. Usually, a database course is taught as an academic discipline. In our case, the topics included in the course had the following order: Conceptual modeling (UML or ER) for DB design, Relational DB, Synthetic DB design (converting a conceptual model to a relational DB schema), Analytic DB design (Normalization), Relational algebra (RA), SQL, Transaction Management. Besides lectures and tutorials, the course included projects where students could really understand what a DB is.

The sequence above includes highly abstract topics like Normalization, and RA, near the beginning; these topics are difficult to understand for the students with less training in mathematics and abstract thinking. To improve the situation for these students, the order has been change so that the student can have hands on experience with the

relational database before going to the more abstract topics. The current sequence of topics is as follows: Conceptual modeling, Relational DB, Synthetic DB design, SQL, RA, Analytic DB design, Transaction Management, but it can also be changed, e.g., by moving Conceptual modeling and Synthetic DB design after SQL.

The above represents changes in the teaching methods. To make the change more effective, we also made changes in the technology employed by designing and introducing in teaching practice SQL Tutor [18] to give quicker feedback to the students completing SQL assignments.

### 4.4 Introducing Bologna Process recommendations

This story concerns revision of the structure of DSV education according to Bologna Process recommendations. Though the decision was taken on the governmental level, its implementation is related to the structural coupling between DSV and UMS (university), which ultimately makes the decision to implement Bologna recommendations. Before that, DSV had a two steps educational program: (1) a four years candidate program and (2) one year magister program. Most of the students took only the first step and went to work in the industry. According to the Bologna recommendations, the steps were redefined as: (1) three years bachelor program, and (2) two years master program.

The situation of enrollment did not change drastically after the change. Still, most of the enrolled students finished only the first step and went to work in the industry. The actual result was that the first step became one year shorter. As the result, DSV needed to diminish the number of courses given to the undergraduate students. When deciding of what to cut, the structural coupling to ES (employment system) had been taken into consideration. The subjects that were considered of high demand by ES, e.g. knowledge of programming language Java, resulted in other programming languages had disappeared from the mandatory courses. The latter makes the graduates less of generalists and, therefore, could negatively affect the ES in the long term.

### 4.5 Introducing distance MS programs

During the last 5 years, DSV has introduced and/or tried to introduce several distance programs on MS level. This can be considered as an attempt to overcome limitations connected to structural coupling to SM (Stockholm Municipality), i.e. uncouple itself from SM, and outreach to potential students from LLES who will not or cannot temporally change their location or cannot study full time during working days. There were also some expectations that a distance education might require less resources than the campus one, but these expectations have not been verified so far. Note that the possibility to uncouple from the location is distinctly coupled with new technology that facilitates such uncoupling.

DSV tried four distance MS programs ICTD – Information and Communication Technologies for the Developing world, ITPM – IT Project Management, Open eGovernemnt and DSRA – Decision Support and Risk Analysis. Only the last two

 

programs survived so far. The reasons for DSV not being successful with the first two programs are explained below.

Opening the ICTD program was the result of the DSV management being interested in the topic and the State (i.e. SHEMS) deciding to provide extra support for this area. The latter resulted in that money could be obtained for the program development, in difference from other distance programs that were developed based on own resources. The ICTD program was closed a year ago due to the following two factors. Firstly, only EU citizens and residents could enroll to this program free of charge; the citizens of the developing countries, who might be more interested in the program, needed to pay. This resulted in the number of enrolled students being too small to justify having the program. The second reason was a particular requirement for having an MS program from the University (structural coupling to UMS). Namely, the department needs to have the subject of an MS program included in its research areas. The latter ensures that there are enough senior members of staff to supervise MS thesis. As the management was unsuccessful in convincing enough senior researchers to enter the area, the program was stopped. The same reason was behind closing the ITPM program, though it attracted quite a lot of students to be enrolled.

## 5 Conclusion

As has been stated in Sections 1 and 2, our goal with the current investigation is to test whether the concept of structural coupling could be useful for practical purposes of maintaining identity in an institution of higher education. To reach the goal we built a simplified model of DSV and its environment that shows to which elements of the environment DSV is structurally coupled and what is the nature of the coupling, e.g., input, output, etc. Based on this model, we analyzed past decisions related to structural coupling with these elements. The examples considered show that:

- When making a decision that affects structural coupling to one of the elements of the environment, there is a need to see how it may affect structural coupling to other components (see examples in Section 4.4 and 4.5)
- Making a change or allowing a change happened evolutionary while forgetting an important structural coupling may result in an existential threat (see example in Section 4.2)
- Changes related to managing structural coupling may affect any component of the socio-technical structure of an organization: methods, technology, people, or their relations.
- When considering decisions related to structural coupling, there is a need to take into consideration the capabilities existing in the current (socio-technical) system. A decision that does not require developing new capabilities, e.g. hiring new people, or convincing the existing staff to change their research directions, has more chances for success than when the development of new capabilities is required, see examples in Section 4.1 and 4.5.

Based on this limited investigation, we can conclude that the structural coupling approach could be useful for making decisions related to maintaining identity. To make this conclusion stronger, more research is needed, which is included in our plans. In particular, investigation of how each of the structurally-coupled elements "sees" DSV could be useful for brand management, and other measures directed at marketing. This investigation is currently underway, being completed by two of our MS students.

As a side effect of our work we can consider Table 2 that could be used as guidelines for finding structurally coupled elements for a given organizational system. These guidelines are tentative, as they were tested only for an educational institution. Other types of organization may require extension of Table 2.

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