

ENHANCING PROFESSIONAL PRACTICE - SEMANTIC MODELS AS A BACKBONE FOR EXECUTIVE EDUCATION

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ABSTRACT

This article outlines the use of semantic models in Executive Education. Semantic models have positive influence on transparency, support human mental models, visual learning and may lead to organizational consequences in Executive Education.

1 Semantic models for Executive Education

As the majority of American business schools are focusing on a functional MBA curriculum, this approach may have some limitations (i.e. Mintzberg 2004.) Nevertheless nowadays some business schools are trying to overcome the functional subject orientation with a more program based view or stakeholder view (see Bisoux 2007, Moore 2007). Yet the University of St. Gallen has developed its own way to train future Executives. Since decades the University of St. Gallen uses its St. Gallen Management Model (see Rüegg-Sturm 2003) for training students and Executives in management issues. This model is used – among other tools like site visits, cases studies, action learning etc. - to foster a holistic view on management and describes the influences of stakeholders and the environment in interaction with management.

The latest enhancement of integrative thinking and training is now done via semantic models at the Executive School at the University of St. Gallen. While semantic models are not new and already heavily used in IT and even business modeling (e.g. W3C 2008, Wu Chen 2008, Lee 2005, Droste Gurevich 1993, Tse 1991), the use of semantic models is quite new for its use in Executive Education. What does semantic modeling mean for Executive Education at the Executive School in St. Gallen?

2 Genesis of semantic models

Within the newly founded Executive School of Management, Technology and Law (ES-HSG) a new Competence Center "Integrated Management" was established in 2007. Its tasks will be the further development of the St. Gallen management model with special respect on Executive Education. For this reason we'd like to reflect shortly on the history and current achievements of the model to

capture the requirements for the future and then come up with model enhancements.

A semantic model - as we understand it - consists of semantic terms (equals elements within management), which are noted down in a consistent and not overlapping manner. These terms or items are then interconnected with lines, showing the relationship between them. These interconnected terms then build up a semantic model or semantic web. How did we get started to use this approach?

Compilation of lectures: First we started with reviewing the content of our MBA and EMBA lectures. We compiled the content of each lectures via core terms used in teaching and recorded the relationship between them. This step was done with a mindset of completeness and freedom of contradiction in mind. The goal was to achieve an overview of the lecture's content and terminology. So each individual lecture was transcribed to a network of key terms and relationships (and/or) between them. These key terms and relationships were then modeled via a graphic editor and served as a visualization chart of the lecture's structures and content.

Content revision: After scanning the lectures we reviewed the content in terms of

- **Completeness** – (is it possible to build a concise wrap up of a lecture?)
- **Contradiction** – (are the terms defined clear and without contradiction?)
- **Overlapping** (is there overlapping between the semantic items of the lectures?)
- **White space** (are there important topics not or just barely covered?)
- **Semantic congruency** (are the terms used in teaching consistent or are there synonyms and homonyms?)
- **Linking** (are the key topics interconnected to neighbor disciplines or are there information islands?)

Semantic models as a cornerstone for curriculum and faculty quality control: This "semantic screening" lead to some surprises: we discovered white space between the

lectures – i.e. while many lecturers were talking about strategy development, nobody talked about strategy implementation. Also we discovered that many of our lectures had overlapping content (which can eventually then be an indicator for later student dissatisfaction) – i.e. we found many strategy development contents. And, of course, we found a lot of synonyms for the same content, which made the life for the learning student not easy, as he had to cope with different terms for the same content. These findings – visually immediately apparent through the graphical network structure – led to an engaged discussion among the faculty with the result, that many slides and contents were rewritten and aligned or harmonized. This all with the intent to clarify things and improve the overall course structure and content. After applying all these changes we had a better, clearer and more consistent model. Definitely the semantic model approach improved so the quality of the courses in our curriculums fostering so content transparency and clarity.

Pilot classes for testing semantic models: Next we used the semantic models in two programs with 30 Executives each (diploma programs with 45 ECTS points). Each course in the program was equipped with a semantic model, which was then presented and discussed within a wrap up session at the end of each module.

The results were then qualitatively evaluated and compared to a class without the use of semantic models. While this approach is not rigorous in scientific terms, the first usages of semantic models indicate promising results and will be evaluated in a later study more rigorously.

3 St.Gallen teaching model different from American model

An often used practice within American business schools is teaching along individual examples or cases and abstracting from them. So case by case Executives learn the recipes of success – yet these cases are from the past, while tomorrow’s challenges may be different and may not be solved with the recipes from the past. Whereas written case studies – typically for many US based business schools like Harvard or Babson College - deal with individual company experiences in a defined setting from the past, the St. Gallen way in dealing with semantic models is different.

Semantic models need no specific case with time constraints or specific industry context; they are enabling the teacher to focus more on the underlying “backbone” of business structures rather than conditions of an individual company or industry sector and its actual constraints. Nevertheless, every “historic” case study can be enhanced with a structural semantic model. Seeing these structures early, helps training the Executive to see beyond a historic case and its time bound variables. It means seeing more the general and underlying, general structure as well as more

details in connection with a specific theme. For the Executive this approach delivers always a path to the knowledge or content of the previous and upcoming lectures, too.

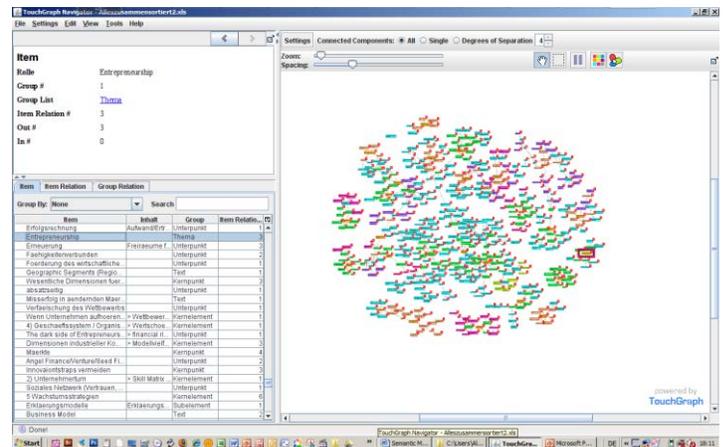


Figure 1: Graphical representation of a general management curriculum showing the semantic content of the individual courses and their links

4 The use of semantic models within the Executive School

Introduction and wrap ups in lectures: The semantic models can be seen as “cognitive landscapes” or maps where faculty or Executives can get a better orientation, a bird’s eye view on an EMBA or MBA curriculum. Cognitive landscapes or networks are important for the ability of humans to connect new content to existing knowledge accordingly (Klein 1999, p104ff). So an extract of the semantic model is used often to initiate a learning session or to close it – answering the Executive questions “where do I go from here” or where “did I come from”. The location of the semantic items in the general model of the course serves as a visual anchor; semantic models can define interfaces to a neighboring discipline precisely, too.

Integrative cases with semantic models: Other “incarnations” of semantic models are specially designed teaching cases around specific topics or semantic networks. In case studies we stress not so much a historic or industry specific context but the underlying structure and connections of a business theme. Cases illustrate then the more abstract content of semantic models with concrete company specific details.

Co Teaching makes integration a living experience: Next to showing concepts and semantic items on a map, we introduced co-teaching sessions, where faculty from two or three different disciplines showing a distinct and alternative view on a subject. So a law faculty might explore the legal issues around intellectual property, while a finance lecturer

teaching targets. This led to standardized modules with a defined content, clear interfaces and prerequisites supporting so much better the requirements for ECTS module descriptions. For program managers the approach helps to design programs much easier and quicker, especially this is true for in-house or custom programs, where individual content has to be defined for a company. The lectures content is then visible with one map and the interfaces are clear. Semantic maps can also be used in the customer communication when a new program has to be defined from scratch – the business school can so demonstrate its competences and may get a better definition of the programs goals. When the buying customer gets a better understanding of the content and the assigned faculty, the buying decisions may be influenced positively, too.

New faculty roles: As the content of the lectures within courses is now transparent in a unique and easy to communicate way, the teaching professor is often no longer the magus doing magic with the class – we see an empowerment of the program director, who becomes more and more an empowered “integration director”, freeing him from being a mere logistics manager to a different, yet more demanding role. The program director is now more directing and planning individual teaching contributions and filling in the blanks and doing the integration work. Missing or incomplete parts of a lecture can be spotted quicker, enabling so program managers to be more active in quality management. As the knowledge and key terms of lectures are better understandable, program directors can use the semantic models to lay out and summarize individual lecturer’s contributions thus providing overview, red lines and hint to missing links. They directors become the integration specialists while the classical faculty is teaching subject specifics deeply at the core and can specialize where they are the best.

6 Student effects

Orientation and expertise: Experts, Klein (Klein 1999, p. 148) states can see what is invisible to someone else, especially he points out that experts can see:

- a) Patterns that novices do not notice
- b) Anomalies
- c) The big picture – situation awareness
- d) The way things work
- e) Opportunities and improvisations
- f) Events that already happened (the past) or are going to happen (in the future)
- g) Differences too small for novices to detect
- h) Their own limitations

How do these findings relate to the use of semantic models in executive Education? While we were not able to observe that semantic model foster points f), g) and h) we saw improvements in the points a) to e).

Giving the big picture: In the use of semantic models we noticed, that their use helps the lecturer to structure lecture content more clearly, the transparency of the topics in the lectures was improved. The attention to detail a) and the overall big picture c) was greatly enhanced and students got a better sense of how d) the way things work or are connected usually.

Quicker scanning of structures: As experts have to be trained to develop an ability to quickly scan (organizational) structures if they are healthy, efficient and effective, we have seen that the use of semantic models increased the speed managers can identify structures in an organization and value them, thus enabling to spot anomalies better b) and giving hints to optimizations in the sense of e) opportunities and improvisations.

If quicker identification of business chances and risks with all their consequences are key expert tasks in management, we found the semantic models may help to support the identification of these in a better way as the structures provide structural clarity, laying so a foundation for more responsibility and entrepreneurship by leveraging the identification of e) opportunities and risks.

Mental models: The semantic models can not only act as a backbone for program managers and faculty, they allow the building of mental models (Klein 1999, p.89) while managers are learning – we found the earlier we introduce the semantic models in our lectures, the more it helped the Executives to develop their own network of terms and knowledge. As experts are becoming experts through seeing more details (Klein 1999, p.147), the semantic model approach encourages Executives and lecturers to explore more structural details of a given problem, building so expert knowledge on the spot.

Support of more channels of perception: As the semantic models are visual and not just textual information as f.e. case studies, the visual network structures are more easy to remember and can stimulate a visual channel for learning. This is important, as studies indicate that many human beings learn better by visuals³ and the more different communication channels are used in parallel during communication, increased precision and meta information about a learning subject is flowing. This enhances and structures the learning effect (see Merten 1977, p.102ff).

Support of learning transfer: In Executive education learning transfer – means applying knowledge from the lecture to specific situations on the job – appears to be a major problem (Gris 2008). Transfer coaches may be an answer – another may lay in the structure, how learning is organized. We see as we are working with our Executives,

that a mental model built along the lectures is much deeper rooted in the brains of our managers than a conventional text or script. Within simulated cases the Executives demonstrated quicker solid solutions while planning and implementing a study project. Further research has to validate these early observations with empiric evidence.

7 Limitations

While the use of semantic nets may improve learning positively, we found several limitations in the use of semantic models with Executives.

No business dynamics: Semantic models allow no dynamic view of an enterprise, therefore the dynamics in a given situation have to be modeled separately with other techniques (f.e. Honegger 2008) and tools (f.e. Stella see ISEE 2008), yet a clear semantic may help to be precise and select the right variables for a simulation.

No details – not self-explanatory: As semantic models are just summaries of key terms and their relationships, they provide no detailed explanation of terms and its proper context. During use we noticed that such an explanation always has to be given with the lecture, as the nodes within the graphical representations are not self-explanatory.

No importance indicator: As semantic nets are “flat” and have no indicators, which nodes are important or relevant in a given situation, only experience with practice or case study work can tell the Executive, which nodes are important to select and relate to in a given situation. Also they do not give hints to solutions of a case. Therefore we think semantic models and case studies nicely enhance each others strengths, yet are not replacing case studies.

No procedural guidance: Where semantic nets shine in showing wide relationships, they fall short, when a given situation demands direction in the sense what steps come first, which are second to tackle a real world problem. Semantic nets offer a grid of semantic terms, yet they do not allow identifying sequential tasks or steps to solve a problem. This has to be done with separate procedural models, which should draw on correctly defined terms within a semantic model.

8 Future outlook

Knowledge management of business chances and risks: As the semantic models clearly indicate the relationship between different areas of knowledge, it might be worth while developing a specific domain a little bit further – the knowledge of business chances and risks and its context. While the assessment of the structure of the semantic webs can identify business chances and risks already, we think that this might not be sufficient to train future managers. We will therefore enhance our domain

spaces with the knowledge of business chances and risks, as we see this knowledge is essential for future managers.

Dynamic models – business simulations: Whereas semantic models by nature are static, business is not. Various business simulation tools and techniques are already well established in Executive Education (i.e. Topsim, Stella and others), we think semantic model might be a starting point to deliver clarity and precision to variables defined in business simulation games. We can imagine, too that future versions of our semantic models might even become dynamic and interactive with methodologies as the connected thinking method (Honegger 2008) enabling so the student to see dependencies and interconnections of structures and business decisions.

Procedural models: Semantic models can define the structure of semantic items and their relationship in a network structure. Yet very often in business procedural models are in demand: the steps to perform reorganization or a due diligence. Whereas a semantic model can show which topics are involved in i.e. a due diligence process, the processes tasks in a sequence are not noted. So in supplement to the semantic models, we think procedural models may enhance the underlying structure of semantic models – they may be formulated for typical and repeating business tasks.

Empiric validation necessary: Our two classes with 60 Executives are not a sufficient empiric basis to value the use of semantic networks in Executive Education. Next to widen the sample basis within the population for our research, we think it might be useful to extend the time horizon in evaluation (to study effects in sustainability) and apply a better methodology in the future (formal surveys, more professional sampling etc.).

Standards within Executive Education: Summarizing our approach with semantic modeling, we can say the approach helps to train Executives to perform better with complex issues, situations and structures. A red line within lengthy programs like EMBA programs, overview and orientation as well as a clear outline of the lecture’s content are the benefits of this approach, too.

For the faculty the approach allows quality improvements while structuring and communicating the teaching content in a more concise way to program managers and colleagues in a neighboring discipline. On top of this we think, this approach might become a way to industrialize Executive Education in the sense of repeatable, interchangeable modules with clearly defined content and outcomes. Further standardization may be new to the industry, yet the trend to harmonization and standardization is already recognizable at the horizon, where accreditation organizations like EQUIS or AACSB and ranking bodies such as from FT (www.ft.com) will lead to comparable structures.

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³ Research by Child Development Theorist Linda Kreger Silverman suggests "that less than 30% of the population strongly uses visual/spatial thinking, another 45% uses both visual/spatial thinking and thinking in the form of words, and 25% thinks exclusively in words. According to Kreger Silverman, of the 30% of the general population who use visual/spatial thinking, only a small percentage would use this style over and above all other forms of thinking, and can be said to be 'true' "picture thinkers.

While visual thinking and visual learners are not synonymous, those who think in pictures have generally claimed to be best at visual learning. Also, while preferred learning and thinking styles may differ from person to person, precluding perceptual or neurological damage or deficits diminishing the use of some types of thinking, most people (visual thinkers included) will usually employ some range of diverse thinking and learning styles whether they are conscious of the differences or not." (Kreger Silvermann 2005).