Using a graphical approach for managing soft-facts with soft-ware

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Abstract: This paper presents a new approach to use soft-ware for managing soft-facts[4] and focuses on the advantages in reducing time to read papers and to forward communication quality. Some of the biggest challenges in sharing knowledge are to ensure a high level of quality in the fast growing amount of information. This paper treats of how we used an object-oriented[11,12] symbolic based logic[16] to develop a commercial software tool kit to be used to support managing soft-facts using predefined information models. Information models are to be easily designed and adopted in a teach-in like way. Snapshots and time series help to learn about the usefulness of the designed models. Our approach grabs information in the early stage when it is created, and stimulates to collaborate in expansion and evolution. But it is not easy to fill information in complex models, so we designed the brainstorming, voting and cloning utilities.

1. Introduction

Traditionally, software applications are mainly used for commercial purposes with a strong algebraically background like in ERP systems. A lot of our daily business is managing soft-facts like find and communicate our visions and targets, develop and appraise new ideas, dealing with and solve problems, managing the community and organize learning processes. And it does not make sense to focus on a single soft-fact, only a holistic approach assures satisfactory results in the long run – what we call "the big picture of soft-facts".

Figure 1: Benefits of a holistic approach

If you would like to use or develop a software application to manage soft-facts you have to bear a lot of challenges – semantics[1] is just one of them. Soft-facts do not fit in a measuring system. There are no known units and no exact values that could be used for. Soft-facts may be treated either in a system model[2] or in a process model[3]. Many of our soft-facts are rated on a gut level. Soft-facts became a serious thing also in business at least since Basel II ratings[4].

1.1 – Methods managing soft-facts

As we know from our daily business there are methods for managing soft-facts, but we barely use them. We mostly work like in the Stone Age using: slates, scrolls, paper, text documents, flip charts, sliders and mind maps.

But there still exist holistic methods like balanced score cards[5] even though they have a very special scope and are often not used in a satisfactory way in practice. Maybe these troubles come up due to the mere focus on a ratio system. Balanced score cards tends to result in complex hierarchical spreadsheets. And this is not really conducive to develop new ideas but leads to freezing in bureaucracy.

Figure 2: Ancient methods managing soft-facts

1.2 – soft-ware managing soft-facts

There is also soft-ware available assisting us in drawing and writing like word processing, slider presentations and mind maps. But counting words, using style sheets, animate pictures and dumping ideas does not ensure information quality but increase the information overload.

You can also use a content management system and web blogs to centralize information and to enforce collaboration. Though they are not expensive in acquisition, but once used, they lead to a lot of work to manage these systems. And it is very difficult to get information back out of these systems to use it again.

Of course we have some software to support our business processes and we can even do some workflows with them. This is why they are based on modelling techniques from software engineering like UML[11] or OMT[12] and so on. But these techniques are not easy to use and you will need some software specialist to accomplish these utilities.

Drafts of software standards for creating the "semantic web"[14] are also available, mainly depending on XML based specifications using DTD's or XML schemes like RDF, topic maps, OWL, DAML+OIL, MOF[19], MDA[18] and so on. And there are tools available based on this drafts. And these tools are really very close to our approach. But the scope of this standards and tools is mainly in indexing information and defining machine-readable complex information. What we are missing is a better relation to practical applications, and we hope to do this with our approach.

And there are a lot of appeals to use the Internet to deal with soft-facts like "the cluetrain manifesto"[20] encouraging us to be on the right track.

2. Objectives

We live in a commercial world – time is money, and you have to sell – and we live in a dynamic world – information grows in an exponential way – and communication becomes more and more difficult. Therefore our objectives for developing a commercial software tool kit, to be used to support managing soft-facts using predefined information models, are:

1. attract information in a memorable way (graphical approach)
2. reduce time to read and ensure communication quality
   (predefined models, collaboration facilities)
3. support a holistic approach (the big picture of soft-facts)
4. support a process model (learn about the usefulness of the designed models)
5. easy to use and to handle (teach-in rules, cloning of information)
6. scalable and saleable infrastructure (software tools, interfaces and standards)

2.1 – attracting information in a memorable way

One of the major challenges in sharing knowledge of knowledge workers is the fast growing amount of information and the increasing complexity of systems to deal with information to ensure a high level of attracting attention. Attracting attention is very important to keep information memorable but not at the expense of quality. This important fact is discussed in theories like memetics[6].

Attracting information has many facets from structuring a text document and using text decorations up to video animation and audio background music. Humans have different capabilities in learning and remembering. Graphics helps a lot in expressing and in understanding information. An interesting example of using a graphical approach is e.g. the visualisation of decision-making in the Scottish parliament[10] presented at eChallenges 2004 in Vienna.

As we have to reduce our words in this paper to keep information attractive, we also need to accomplish some rules in designing graphical information. It is the ability to give precise information and keep the amount of information to a minimum. We know this from comic strips and cartoons but also from poems. As this is an art to do it well, we need some rules and better some predefined models, schemes or templates that we can use again and again – like you do it with style sheets.

Figure 3: screenshot: adding new information objects: information type selected from a graphical meta schema (left frame top) and information objects selected from a database query list (left frame bottom) – resulting graphical representation in the right frame

2.2 – reduce time to read and ensure communication quality

Especially technicians know that some kind of schematic drawings can reduce time to read and ensure communication quality dramatically. But also businessmen often use pie charts and bar graphs to visualize information.

Almost everybody of us uses presentation slides and spreadsheets to handle with complex information and to attract attention. We use flip charts to communicate in teams and we make digital photos to store the information. But this does not really reduce our time and ensures quality of our communication like schematic drawings do, except in special situations where we have to communicate about the content of a picture.

Technical schematic drawings on the other hand have a very strong syntax. And it took a lot of time to get the standards that are needed for this. And we can see that there is also a lot of working software to handle technical schematic drawings. This works because of the very specific scope of the different standardised schematics. And it takes a long time to achieve interoperability between different versions from different suppliers.

What cases in information communication should be supported and what are the best data models and communication rules to be used? A never ending discussion and a lot of bureaucracy will happen until we would get a working standard, though standardisation of technical aspects was still started at W3C[15].

Our approach is to use a simple but easy to handle meta model generator for graphical representation and navigation with facilities to learn about the usefulness of the designed models.

2.3 – support a holistic approach

But handling our documents is not enough in our daily work, we also have to make reports and we have to fill databases with data. And if we really want to get some serious attention we also have to build some web pages with animations and send some e-mails. We have a lot of post-its to keep the most important information memorable - haven't we? The key question is just a simple calculation on how many papers we can manage to write in our job. We must build sentences, do some spell checking and make some text decorations and drawings. And how many papers can we manage to read in our job. We have to deal with ambiguity and translation problems, and we have to manage huge amounts of papers and therefore we need a preselection and a possibility of comparison.

And we have to consider different subjects in our work too. A lot of our daily business is managing soft-facts like find and communicate our visions and targets, develop and appraise new ideas, dealing with and solve problems, managing the community and organize learning processes.

And we know that only a holistic approach can take us to the top in the long run. The best ideas are just a waste if they do not fit our targets. And we lose a lot of money if we do not focus on the most important chances and risks. Learning busy as a bee does not make sense when we do not learn the right things relevant to our business and to our scope, and so force. As things changes faster and faster, we need facilities to compare and vote data and to grab data at the early stage when it is created. We have to use a single namespace to address different data the same way.

2.4 – support a process model

Taking into consideration that we are living in a changing world and that we know that soft-facts are not easy to map into a logical data model, we need an agile process model. It must be easy to create data models and we need to learn about the usefulness of the designed models. So we designed a meta-model processor with teaching-in facilities for the information rules.
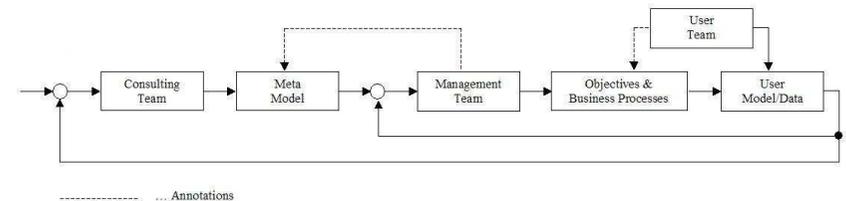

Figure 4: schema of the two-phase control loop process model

The holistic approach, the "big picture of soft-facts" is used to control the organisation by defining visions, objectives and targets and defining the business processes by the management team. The user team can use and annotate this models and rules. Snap shots and times series show what was used – this is the inner control loop.

The consulting team defines the meta models and information rules, what information types are to be grouped in what level of information schema, what navigation-path is

needed in this level and what formulas do we need there. Here again annotations, snap shots and times series show what was used and what was missing – this is the outer control loop.

2.5 – easy to use and to handle

Especially in complex projects with the needs of knowledge transfer, like in networked product organisations[7] or business and research cluster management[8] or in healthcare communities[9] reading and managing all the important papers to get a picture of what is going on and what are the improvements, is a real challenge in daily business. And managing reading all of them again is not enough. We have to pick up our resulting ideas and have to organize them in a memorable way if we want to take an advantage and communicate it again. The theories of memetics are an interesting point of view for this process of knowledge sharing[6].

Our approach grabs information in the early stage when it is created, and stimulates to collaborate in expansion and evolution. But it is not easy to fill information in complex models, so we designed the brainstorming, voting and cloning utilities.

2.6 – scalable and saleable infrastructure

There are different technologies available for handling data in an object oriented way as we need here. But as we develop a commercial tool kit we also need the ability to offer a support infrastructure. And we want to use and participate in new standards and technology without the need to do everything by our self. And last but not least we need commercial partners in marketing and distribution.

So we decided to use a commercial database platform offering XML enabling, web services and web scripting and use it along with the graphics standard SVG[13] which is pure XML.

3. Methodology

First of all we have to handle the "why" and then we can handle the "how". Our approach is strongly influenced by the theory of memetics[6], because we handle the "why is some information sold successfully" and "why do humans produce this information overload".

The "how" is covered by an object-oriented[11,12] symbolic based logic[16] process model[2], and handles the questions "how can we reduce time to read papers and to forward communication quality" and "how can we manage the big picture of soft-facts".

3.1 – memetics: attracting information memorable

Sorry, not the best information wins but information that is attractive and memorable. Technicians can sing a song about that. And why is the whole world drinking Coca-Cola?

Humans have emotions and therefore in the broadest sense, love has little relation to equity. We do not remember the best facts but these we can replicate best.

Figure 5: Typical memes as labels used for branding

Information treated as itself – memes like genes – shows the behaviour that there is an evolution of information by imitation. So it is essential that information is attractive to become noticed and that it is memorable to become replicated and that it is precise and self-explanatory not to be mutated. This is like you want to cook some cake that you have tasted somewhere or if you have got a recipe.

3.2 – an object-oriented symbolic based logic process model

To achieve our objectives and to allow for memetics we need an easy to handle, precise description of information with the capability of meta models for graphical representations.

To keep information precise and self-explanatory we use a symbolic based logic[16] as known from artificial intelligence. It helps to handle information rules.

The object-oriented approach ensures to handle meta models in an efficient way. It is well known from software engineering (UML[11], OMT[12]) and also from the semantic web [14]. The graphical representation should be done in the web, so we choose the XML based SVG[13] standard.

We choose not a system model[2] like e.g. Leonard describes "The Viable System Model" as a very interesting approach in knowledge management. But we use a process model[3] like e.g. described in "The new Methodology" and as we learned in many software development processes as a very useful approach. We think that it fits very well in our approach to manage soft-facts.

3.3 – the big picture of soft-facts

As we are developing a commercial tool kit we have to support economic scenarios. But we think that the "big picture of soft-facts" is always nearly the same:
Target Finding (Zeal, Visions, Objectives, …), Idea Finding and Realisation, Chances and Risks Management, Business Processes, Technical Documentation, Problem Management, IT Strategy and Security, Education and Training, Community, Marketing and Sales.

Figure 6: The big picture of soft-facts

The graphical approach and multilingualism support help a lot in managing soft-facts in a holistic approach. The process model we use is: Modelling the meta-model, Brainstorming, Voting, Cloning the information into the meta-model, Annotations for communication, Snapshots and time series for learning, Adapting the meta-model.

And we have an additional organisation model to represent the organisational structure: Organisation Units, Positions Persons, Fields, Responsibilities, Parties, Projects, Tasks, and Limits.

4. Technology Description

The user interface is a web browser (Microsoft[®] Internet Explorer) with an SVG Plugin (Adobe[®] SVG Viewer). The server side is a web server (Apache Web Server or Microsoft[®] Internet Information Server) and an object-relational Database. Our tool kit is called memeticor[®] mem-topics[©] Memetic Topic Maps – Collaboration Management.

mem-topics[©] is designed to visualise, appraise and communicate issues and facts by easily interactive modelling of an object oriented schema. These schemas are to be interactively used in many cases but always in a consistent and standardised manner. Concerning the outstanding web graphics platform you can communicate in a memorable way and trace issues and facts along with its correlations and impacts. We offer substantial options for interaction available by the use of state of the art database technology:

- Searching, Brainstorming, Voting and Cloning of Information
- Data Input and gathering, visualisation and formula evaluations
- Annotations, Comparison lists, Snapshots and time series
- Calendar functionality and e-mail notification
- Multilingualism support

The mem-topics[©] tool kit architecture is divided into the meta-model part for designing via teach in by a consultant. This meta-model is also used for navigation by the end user to structure their data models and is in the same name space as the data-model. So end users can collaborate about the meta-model with their consultants using the annotation feature.

The data-model is used to gather data complying with the meta-models by brainstorming and cloning and via web-tracking. Figure 4 shows the available functionality in the meta-model and in the data-model.

GUI: Web Browser + SVG Viewer				
meta-model information types	**meta-model** graphics schemes	**data-model** information objects	**data-model** graphics placement	
define	use	use	use	Application
define	use	use	use	Topics
define	use	use	use	Fields
define	use	use	use	Responsibilities
define	use	use	use	Organisation
use	use	use	use	Search
define	define	use	use	Brainstorming
define	define	use	use	Vote
define	define	use	use	Clone
use	use	use	use	Annotate
use	use	use	use	Compare
use	use	use	use	Snapshots
define	define	use	use	Time Series
object-relational repository				
interfaces: XML, ODBC, SOAP, Java, EJB, .NET, SAP etc.				

Figure 7: The mem-topics© tool kit architecture (define and use functionality in different levels)

Interfaces may be done using the database infrastructure from ODBC, Import/Export XML files to web services using SOAP and using commercial interfaces to other business software packages like SAP[®].

4.1 – Implementation

The mapping of the data model into the graphical representation is done by defining SVG templates for the information types and parameters and defining information rules what information types are grouped in graphical schema including a default layout, navigation actions and formulas to calculate grouped data values. This is to be done by a superuser or consultant using a web interface.

The instantiation of these models is done using server side scripting as well as client side communication in the web browser using java-script and the DOM model. A Java Applet is used to communicate with the database server; this applet is embedded in the used infrastructure framework of the database platform.

There is a graphical representation of the meta model used for adding and cloning data, so it is easy to see what information types and rules are to be used in what information level. An auto-layout algorithm helps to fit all the information in a certain layout. The graphical representation of every information item depends on the data added to this item. This is used to have multilingualism support as a text representation. And it is used to have either text and/or graphical representation of calculated or entered data values. There are also animation and graphic effects like filter and opacity available and used to manage readability and attractiveness.

Figure 8: mem-topics© screen shot showing data driven graphical representation

5. Developments

We have developed example meta-models and example applications for the "big picture of soft-facts".
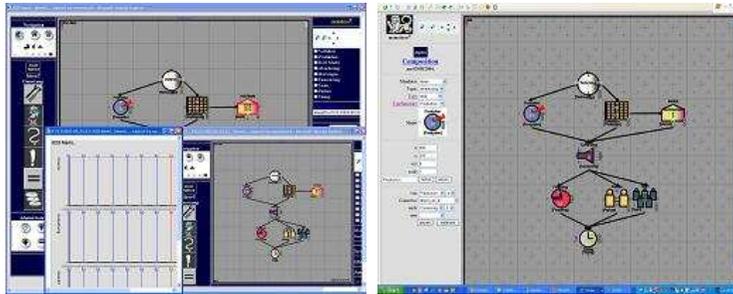
Figure 9: mem-topics© screen shots (brainstorming and voting, cloning, snapshot and time series, composition of a schema)

The screen shots in Figure 5 show some basic examples from target finding and idea management with functions from brainstorming, cloning, snapshots and composition of a schema.

6. Results

Our tool kit mem-topics[©] Memetic Topic Maps – Collaboration Management is ready to use in projects and we are looking for interested parties to do consulting jobs with it.

As a case study we are using our tool kit to develop our own business plans and have designed our targets and ideas for the company memeticor[®] as well as for the different products (there is also a marketing tool kit available called e-mem[©] Memetic Mail Advertising – Campaign Management with a module for sales management called Chess Marketing[©] Sales Situation Management[©]) and their modules itself. For mem-topics[©] we have modules (meta-models) handling the "big picture of soft-facts". There we have defined our targets, its desired and undesired impacts, measures that must be taken, events that will probably happen, interests that must be considered, potential conflicts, strategical and tactical planning and the benefit we expect therefore. And we have the basis for our ideas, the problems and the benefits of the ideas and the implementation - from the technology beyond the market to the necessary timing.

We had also planned a workshop at the eChallenges 2005 to show the brainstorming facility for a discussion about "Challenges to use software for managing soft-sacts – visons, targets, interests, impacts, conflicts, measures, strategy, tactic, benefit".

Both case studies are to extensive for this paper but we can show you a demo at any time. If you are interested in using our tool kit, or if you know somebody who could be interested in, please contact us via e-mail at office@memeticor.com.

7. Business Benefits

Many of new business cases happen in a multicultural environment. New EU Member States and Candidate Countries have different languages. Emerging markets like China have got a very different culture and tradition. Consequently, efficient and effective communication is an important issue.

It is very important to have some archetypes of how to handle soft-facts - rated, compared and annotated - if you are doing a consulting job or a management job dealing with soft-facts. Therefore we think that our approach - using easy to use, easy to adopt and easy to interchange meta models - will be very helpful in many business cases. We call this possibilities ReadyToGo-Consulting[©] and are looking for consultants that are interested in this facility.

We know that new ideas without a target are a pure waste. And therefore we know that only a holistic approach like "the big picture of soft-facts" will bring you to the top in the long run. Information grows in an exponential way, but we need information more than ever. So we trust in the power of memes, and you should do also!

8. Conclusions

Our conclusion is that we lost a lot of time looking for standards and free available tools as we did a software development project in our last company using J2EE and Java Applets to do a similar approach needed for a technical documentation project in an oil and gas company.

We learned that it makes sense to use commercial software platforms to save time when they fit with available standards like XML/SVG in our case. We can see in other projects (e.g. Topic Map visualisation with SVG in the Omni Paper project [17]) that a lot of people are dealing seriously with similar technical approaches.

We also learned that soft-facts are a serious thing in every type of project – missing targets or objectives spread every good idea. So seeing the "big picture" permanently helps a lot to stay on track and to adopt targets early. This conclusion from a previous project was one of the key triggers to our new approach.

And last but not least we had learned that we need a very agile and flexible tool if we want to get a benefit from separating software development and consulting work. So it was necessary to provide very simple functionalities like brainstorming, voting and cloning, to grab information from the user in the early stage when it is created.

Though we know that it is nearly impossible to get information and the intention of the authors back from existing mass data, we want to see how our tools can help to do some re-engineering at least from well-structured documents like open office documents where you can get an XML representation.

And we need to do a lot of work in defining, evaluating and standardizing different meta models and business cases especially in communicating and reaching a consensus in appraisal.

Our recommendation is to think about the following postulate:

- Ideas (and information) without a target are just a waste !
- If your idea (or information) do not match a comparable and appraisable schema sooner or later it will be lost or mutated. Or somebody somehow needs to adopt his schema.
- If you can draw it, you can communicate it !

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