Scenarios for multidisciplinary design purposes

Experiences earned

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Abstract

The Mobile Informatics program at the Viktoria Institute has to some extent used scenario planning as a method for discussing issues related to Informatics research during one year. One important lesson is that the scenario exercises have given the participants interesting ideas and perspectives as a side effect, while some other expected advantages seem much harder to achieve.

Introduction

Projects in large research programs naturally consist of people from different backgrounds, not only with different level of experience and expertise but from completely different fields of expertise. This is required as the scope of most large research programs are broader than a typical academic field and thus needs members representing all necessary knowledge areas regardless of department or faculty. Unfortunately, such research projects tend to develop diverging and ultimately incompatible contexts as the participants bring in their own different perspectives and goals. This is the case as the individuals come from many types of organisations, including small companies, large enterprises, governmental and military organisations, private research institutes and university departments. Each of the participating individuals brings their particular set of goals, values and different managerial traditions, which are often not compatible with those of the other participants. This often leads to losses in time and work, as the different parties do not share common work practices. Different participants interpret the mutually agreed-on goals in their own way, which give rise to misunderstandings. Another consequence is a blurred focus for the projects. In order to overcome these problems, the needed understanding within the projects often has to emerge in an unstructured and unplanned way. This understanding takes time, time that often is not scheduled and planned, and this might be one reason why many such projects always tend to take longer time than expected.

The very nature of Informatics research is multidisciplinary. Many perspectives and academic areas are involved in the process of understanding IT in relation to all these other activities. In addition Informatics research tends to be collaborative with non-academic parties like companies and corporations. Traditionally academic projects are related to companies for the cause of finding real world cases to research. This situation has changed and academic departments and

companies are now collaborating in cross-disciplinary projects. (Dahlbom 1997)

Scenario planning is a method traditionally used in a strategy development context where it is crucial to shape a working strategy for an uncertain future. Described briefly, scenario planning is a method providing a wider range of what-if type of questions and thus gives a better view of the possible uncertainties in the future than would otherwise be the case. Research programs aiming at finding applicable solutions viable in both commercial and academic contexts are required to have a well-developed view of the future. Many different methods have been created to make such forecasts, e.g. the Delphi method where a number of experts are asked what they believe in a number of issues. These give very often one possible future and do not provide mechanisms for validating the prediction. Scenario planning offers a different, more qualitative oriented method, which presents several possible futures and indicators for each of these. (Schwartz 1991; Heijden 1996; Fahey and Randall 1998; Ringland 1998)

In a research program context, scenario planning is not mainly used as a basis for decision making as such, but rather to visualise different aspects of a specific problem domain based on important uncertainties.

As previously argued by the authors, shaping a common perspective between members of a management team or the employees in a small knowledge company can be described as building a common mental platform (Björk and Börjesson 1998). The term *common mental platform* does not imply that all team members should have the same opinions. It should rather be viewed as something similar to a common cultural platform; i.e. a set of commonly defined concepts making discussions about a certain subject valuable to all participants. In the case of a common mental platform, these commonly defined concepts relate to what factors outside the project can influence that project outcome. Instead of inheriting the perspective from one or two of the major participants, our suggested solution proposes creating a new common mental platform from relevant components of the participants' contexts.

At the start of a multidisciplinary project, most participants have different ideas of how the project will develop because of their varied backgrounds. This is especially the case in projects where e.g. technically biased development teams are involved and in which social, political and economical changes might influence the success the projects. In these case, the participants must then stretch their "mental maps" to be able to understand each other and to be able to commonly defined a perception of the future as the basis for the project work. We argue that this can more efficiently be done using scenario planning.

Common mental platforms can of course arise naturally from prolonged interaction between program participants in meetings, presentations and daily work, but scenario planning offers a more structured working procedure that can be implemented before the actual work is initiated. It does not judge the participants' different views against each other, as is easily the case when participants are asked to express their views of the likelihood and importance of possible future events. Instead, scenario planning directs these different opinions towards the goal of making credible scenarios. (IDON_Associates 1997?)

This paper describes our efforts of using a scenario-based method to shape a common mental platform for participants in ongoing research projects, from both the industry and academia, and then specifically Informatics. We describe two cases where the methodology was applied. The experience learned from these cases are presented and discussed, followed by possible improvements for the method. In an

appendix, details of the outcomes of the two scenario meetings are described.

The Scenario Project

The scenario project is part of the *Mobile Informatics* research program at the Viktoria Institute. The project has two main goals: To support the other projects in the program by giving them a larger perspective of their work and to further develop the scenario method. In this we hope to make it suitable for use in other multidisciplinary research programs, in particular to the domain of Informatics research.

Objectives

When applying scenario method in the *Mobile Informatics* research program, there were four objectives set for the project:

- Explore the possibilities of using scenario method in multidisciplinary research programs
- Create a common mental platform for multidisciplinary collaboration within the *Mobile Informatics* program
- Use scenarios for supporting the idea creation and design processes in the research program
- Evaluate the scenario method in a research program context

Use of scenario methods in multidisciplinary research programs

We know of no other attempts to research the use of scenario planning methods in research programs with participants who are heterogeneous in knowledge, traditions and goals. The results from the project would show if scenario planning were a feasible tool for programs similar to the Mobile Informatics research program, i.e. large joint multidisciplinary research programs.

Common mental platform

The most important objective for the project within the program is to try to create a common mental platform between the research program participants. In other words, the project should ease the creation of a common set of beliefs that work regardless of the background, area of knowledge or management heritage of the participants.

Idea creation and design process

An almost as important objective as creating the common mental platform is to use scenarios and scenario methodology as a tool for collaboration in the idea creation and design process. Expected results are better design goals and more stable multidisciplinary foundations for the research program.

Evaluating the scenario planning process

In order to use scenario methodology in the Mobile Informatics research program, we modified the traditional method to fit the setting of the program. Given that scenario planning has not earlier been used in this context, we wanted to be able to refine the method, given that it proved to be of use. Therefor, we saw a need for a thorough

evaluation of each scenario activity, especially to find out which aspects could be improved upon.

Traditional scenario planning

There are at four major advantages with traditional scenario planning: *robust decision making*, *stretching mental models*, *enhancing corporate perception* and *energising the management* (Heijden 1996).

Robust decision making

The process of finding predetermined and uncertain driving forces that are likely to affect the future of an organisation inevitably leads to interesting questions about underlying factors behind these forces. Presenting a diverging picture with several possible futures built from the analysis creates a number of different, but causally plausible scenarios. Such scenarios are extremely useful in discussions about the future and in strategy testing. Decisions taken after being tested through the resulting scenarios tend to be very robust.

Stretching mental models

By focusing on discussions about the underlying driving forces that influence the targeted future, the creation of a number of diverging scenarios can point out issues previously deemed irrelevant in the participants' specific fields. By supporting each other with knowledge and building scenarios together, the participants stretch their mental models; i.e. expand their horizons. Another advantage of this is the creation of a common mental platform, meaning that the participants can jointly identify a common goal and formulate a strategy for achieving that goal. This allows for keeping the participants' subjective interpretations of these strategies and goals very similar and convergent, which in turn reduces misunderstandings and conflicts during the course of the project.

Enhancing corporate perception

The third advantage of using scenario planning is to enable organisations to respond quicker and more effective to new developments in its environment. By thinking about the world in terms of different and equally possible futures one has to formulate strategies which are flexible and work in all, or as many as possible, of these futures. By attending the scenario sessions participants are thus trained in "thinking the unthinkable", i.e. have a more sophisticated concept for events that could affect their own future.

Energising management

By having the organisation manage itself, not by direct instructions, but by sharing a contextual setting, new ideas can quickly be placed in line with the setting. This enables the organisation to work more smoothly and to be more adaptive to the continuously changing surroundings.

Case studies

We have performed a number of scenario related events within the research program during the course of one year. Among these events, we have chosen three of the scenario sessions as illustrative examples of how we have applied scenario method. For a more detailed description of the method use, see (Björk and Börjesson 1998).

The Åsundsholm session

Our most extensive test of using scenario techniques yet, the Åsundsholm session was a two-day seminar held in a secluded conference hotel in Åsundsholm, Sweden. The intended focus for the session was to examine the impact of IT on people's social life in the near future. After some discussion, the participants decided to use the focal issue "Does a majority of people meet virtually in the year 2010 and do they prefer it to meeting physically?" This question was in fact never answered but led to fruitful discussions.

The first exercise, the brainstorming session, focused on what finding the factors that affect an answer to the focal question. The factors identified by every participant was written down on post-it notes and presented to the other members of the group. These factors provided the foundations for trying to identify stronger and more general factors, driving forces.

These driving forces were then presented to all participants arranged as opposing pairs such as e.g.

- Technology fetishism – technology hostility
- Individual base for identity - group base for identity
- Traditional education – flexible education

Since the number of driving forces were many, the groups voted for establishing which driving forces were believed to be the most important. Once this "tilling" was finished, all participants created scenario matrixes using the driving force pairs as axis.

The 14 participants were divided into two groups to make the situation more manageable and to allow fruitful discussions. Each group consisted of two members of the scenario project, and five external participants with varying areas of expertise, ranging from computer scientists to professional classical musicians..

During the following summation, we discussed how the technique had worked out and we learned the following practical lessons:

- The time available for the different steps is important for keeping the interest and discussions at the right level. Some of the sessions were too long and some probably to short, and even if most people found it interesting, the discussions became very unfocused at times.
- More time is needed to complete the scenario process, and perhaps two two-day sessions would work out better. Alternatively, the amount of work can be trimmed down somewhat by preparing more in advance. When asked, the participants were uncertain whether this would be a good idea.
- The participants should be better briefed on the method beforehand with more

information on what is important to think about during each step of the method.
- The two-day exercise resulted in one scenario matrix that the participants felt was most plausible, and a very sketchy explanation of what the resulting scenarios in that matrix implied. Some people expressed frustration over not being able to finish their work. One idea is to cut down on some discussions and have more time in the end for finishing up and presenting the results for each other.

The seminar resulted both in practical hints that enable us to be better at arranging scenario sessions, refine the scenario method and in an interesting set of scenario matrices for future discussion and analysis. In order to get a more theoretical take on the resulting primary matrix, we arranged a session with other researchers from the Viktoria Institute, as described below.

The Viktoria Institute session

While documenting and trying to tie up the loose ends from the Åsundsholm exercise, a new process almost unintentionally took place. When starting to ask questions about what was in fact said during the scenario development session, the picture became much clearer. After a while the project also decided to use individuals from both within Viktoria and from the industry, who were unable to participate in the earlier session, for the purpose of taking the discussion even further.

Preparing the meeting was easy and required just a basic cleanup of the existing matrix. Once again it turned out to be difficult to manage the schedule so that both industry and academia could participate at the same time. During almost a day a group consisting of six people from Viktoria and one person from Volvo discussed the nature of each of the four worlds envisioned during the Åsundsholm session. The meaning of the axis were modified somewhat in the course of discussion.

After a couple of hours it became evident that the model which we were on our way of developing could work as a generic model of explaining societal development, both from an historical point of view, but also for talking about phenomena existing concurrently today. By applying this model to different cultural and organisational structures within companies we could make clear some similarities and differences.

Some experiences from this exercise are:

- The resulting scenario from Åsundsholm actually created a climate where a whole group of researchers eagerly started to discuss relevant things very far from their ordinary research area.
- The result from a previous session could probably be very well suited as input to a following session.

We have not yet tried the resulting models in design projects as vehicles for learning about how different systems should be designed according to the specific requirements present in each envisioned world.

The MobiNews session

In the winter of 1998, a one-day scenario workshop was held upon a request from the

MobiNews project conducted at the Viktoria Institute. The mission was to shed light on the future of newspapers in an increasingly digital world. Participants had backgrounds in written press, IT-consulting businesses, computer science and informatics. We also invited Professor Bo Dahlbom as a lecturer during the lunch break providing valuable input to the process. The preparation for this session was almost non-existent and the group was already put together as well as the time frame for the exercise allowed.

There wasn't much output from this session even though everybody present was heavily involved in the discussions. Evident reasons were the predefined circumstances but some experiences can still be drawn from the session.

- One of the participants had greater experience in the area of the discussion and his input became dominant in most of the discussions. The group should have been better balanced.
- The topic for discussion was ill defined and should have been much better prepared.
- A majority of the participants were involved in the affected industry and were therefor biased against any "negative" scenarios.

Experiences

Apart from purely practical problems (such as having enough wall space to place post-IT™ notes on), we noticed a number of issues that could be improved in applying the method.

Participants in the various sessions quickly became absorbed by the discussion and continued discussing the questions during breaks and after the session was formally ended. As participating observers, we saw that the exercises would have benefited from having more and longer breaks in between, to allow free-form discussions among the participants. The separation of the method into discrete parts had the negative side effect of making the participants want to finish the given task and not discuss interesting questions and subjects that arose during the work. Find ideas that are interesting but tangential to the question in current task is one of the major advantages of using scenario methods. Unless there is room for such discussions, these advantages may be lost and may even be perceived as a disrupting element.

Another problem with a compressed time frame is that the participants do not have time to reflect on the posed questions. Opinions and quick answers are what spontaneously come up rather than more elaborate and thought out ideas. This is positive in the brainstorming sessions, but in more analytical phases, one would like to give the participants the opportunity to reflect and consult other people and other media.

In the sessions where several groups went through the phases of the method in parallel, we noticed that many discussions were similar and also came to the same conclusions (or non-conclusions). Even though this can be seen as indication that these discussion are relevant, it may also just show that the groups are too homogenous or influenced by some common factor, such as current media events.

Many of the participants expressed that they would like a more detailed description of the aim of the exercise and the methodology used. This would,

according to them, allow them to focus more on the important parts of the exercise. We can see two reasons why the participants expressed these opinions. First, they had not used any scenario method before, and perceived the goal of the exercise to create a future forecast. Secondly, the methodology is both rather complex and under development for this specific area of application. The descriptions of scenario planning were taken from areas, unfamiliar to the participants, which made it even more confusing.

Due to absent participants in the MobiNews session, the present group was too homogeneous. Another problem with the session was that the group agreed upon a too limited focus question, probably due to the group composition and bad preparation of the session. The answer to the focus question "Will the news paper, as we know it, still exist in the year 2008?" became skewed as all representatives from the media industry came from newspapers. This resulted in a rather limited scenario set lacking credibility.

In the Viktoria session, previously developed scenario matrices were presented to the research group leaders. The lack of completely developed narratives for each possible scenario proved to be a hindrance, and a lot of additional explaining had to be done. With just the axis names, and some key phrases in each scenario, it was too difficult to convey the reasoning behind the matrix. Earlier experiences with scenario matrices had been much easier to explain while this one was pretty difficult. The main differences between the earlier sessions and this one were the differences in scope, and this expressed much bigger and more theoretical trends in society.

Possible improvements to the method

The scenario sessions probably have to have social or other relaxing activities in between heavy discussion sessions to 1) raise the quality of the discussion and 2) spare the participants for the second day.

More time is needed, perhaps two two-day sessions? One of the main problem is to plan the time much more careful for each phase and eventually stress the groups for results rather than giving them all the time needed.
One must define a specific goal with each short session by giving the participants an example result.

Plan time for documenting and presenting the result to each other. This is now believed to be essential and will diminish some of the frustration people felt from not being able to finish what they have started. There will probably always be a problem with the choice of people. The MobiNews session showed the problem with too homogeneous group, and the group failed in thinking "out of the box".

Provide means of individual research for various topics, i.e. library, Internet access etc. could be very valuable. When having two separate sessions with some time in between you could demand some homework of the participants. In other case it can be useful to provide important literature and maybe Internet connected equipment to make this possible.

The groups should have discussed their results between groups more often. Session leaders can introduce interaction between different groups to avoid tunnel vision and to help groups that have become bogged-down on a specific issue. An obvious risk that a number of scenarios turn out very similar should be acknowledged.

Conclusions

The use of scenario session in the multidisciplinary setting has been proven beneficial. Our modified method was practically applicable and fulfilled some of our expectations. The observed benefits with the method can be summarized as insights on two different levels: on the program level and on the participant's personal level. We had also been expecting some benefit from a design or project perspective as well, but since none of the scenarios so far have been developed to that stage this remains to be seen. New insights on the program level (see Viktoria internal scenario in the appendix)

When working with the results from the Åsundsholm scenario session together with the project leaders of the Mobile Informatics research program, the rich data available proved to be a fertile ground for creating a model of high abstraction describing organisations. Not only did the model differentiate organisations according to previously established important axis, but it also made visible how some organisations may change their structure and ideals due to growth and maturity.

New insights on a personal level

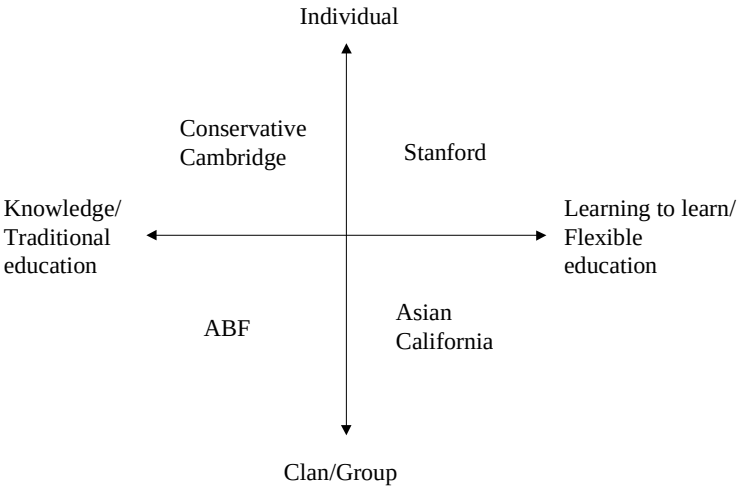
The participants have expressed their appreciation of the scenario sessions and have said that the sessions have given them new insights, on a professional as well as a personal level. From the opportunity to collectively think in a much larger scale some participants said to have added a broader perspective on things usually focused on as just things.

Appendix

A - Scenario matrices from Åsundsholm session

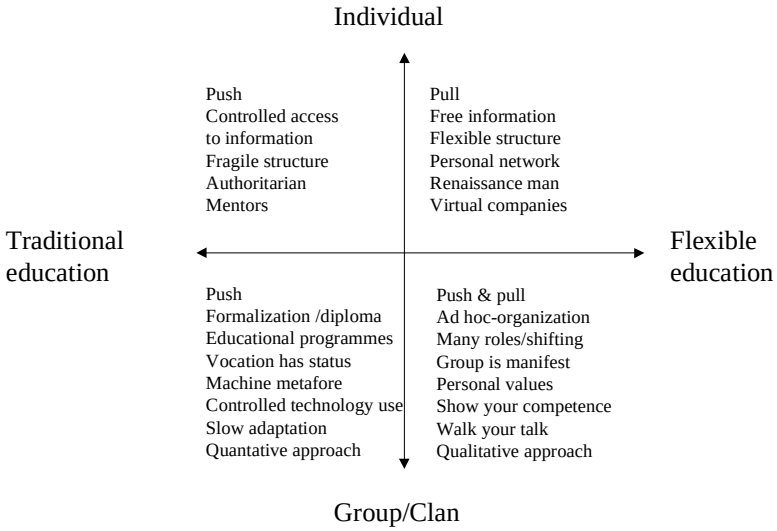
The matrixes were similarly presented and voted on, resulting in the following matrix being deemed the most important, since it deals with a mix of educational principles and how an individual perceives his identity.

Scenariomatrix



This matrix vas then elaborated upon in a single group session once more using brainstorming techniques. This time in a much more focussed fashion, however. The refined matrix looked like this:

Scenario Matrix

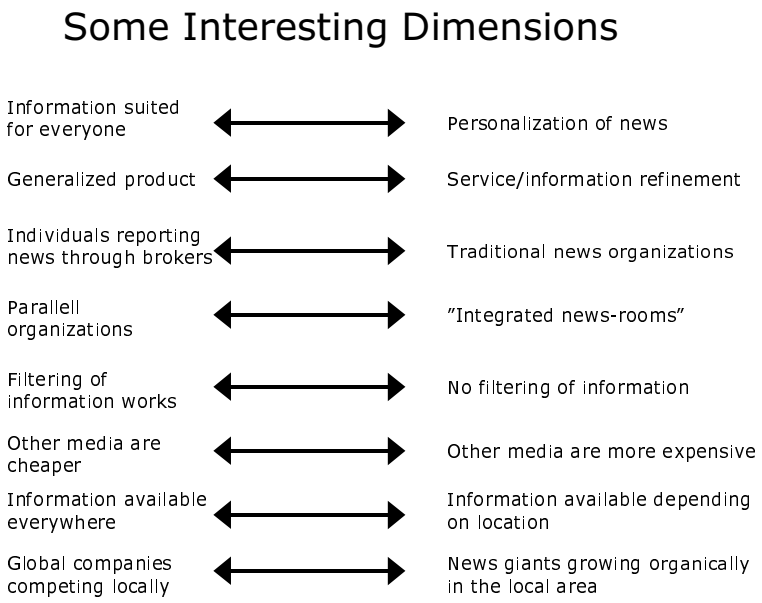


B - Scenario matrices from Mobinews session

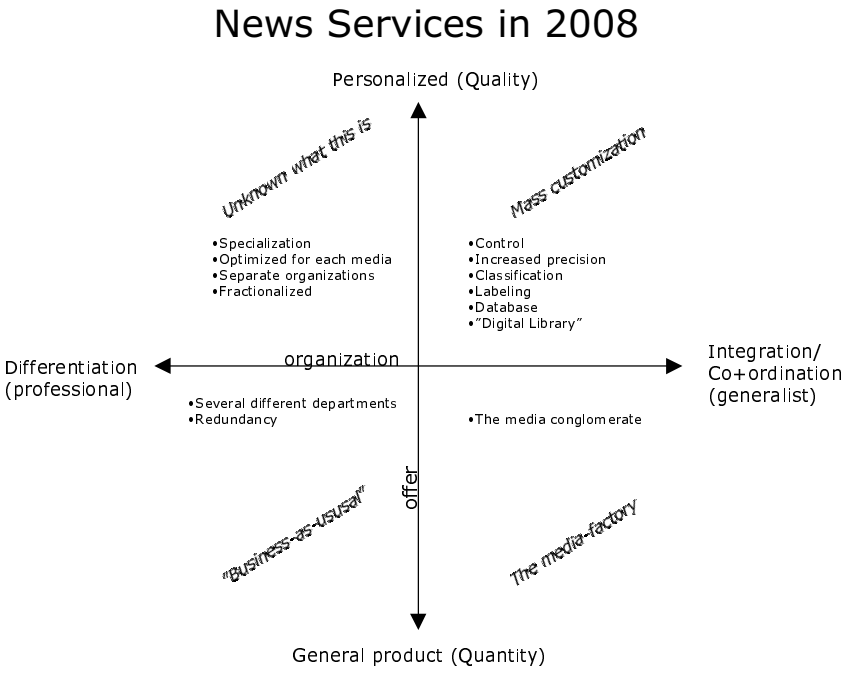
After an initial discussion the focus question “Will the news paper, as we know it, still exist in the year 2008?” was agreed upon.

During the ensuing brainstorming session a number of important factors

affecting the issue were identified and then discussed in order to find the driving forces behind them.



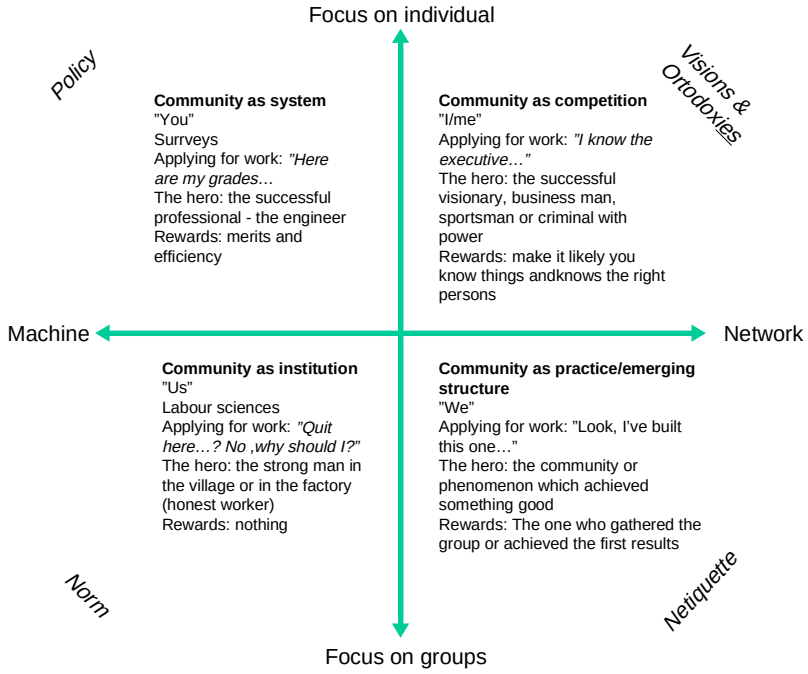
Once an interesting set of driving forces had been identified the participants proceeded to map out scenario matrices using the driving forces as axis. The resulting matrix focussed on (1) whether the organisation would integrate the work or if they would have separate departments for each medium and (2) whether the news would be general (suited for everyone) or becoming personalised.



The analysis of this session is still in progress, but it is an interesting example of how the methods developed in the Scenario Project can be used to support other projects. Especially in enabling discussions involving both researchers and the industry. Some modifications in the method has been made after this workshop

concerning how to choose the focus question and the structuring of discussions when using the method in a compressed time frame.

C - Scenario matrices from Viktoria session



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