

## **THE BUBBLE-TEAM - A CASE STUDY OF A MULTIDISCIPLINARY TEAM WORKING TO INTEGRATE IT AND PLAYGROUND EQUIPMENT**

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### **Abstract**

This paper presents a design project within a playground equipment manufacturer and discusses how a multi-disciplinary team of designers and researchers, partly external to the company, must adapt their working methods and structure to a new situation. The design project is merging two different industrial areas new to each other; playground and information technology. The company launched the team to create content for the intelligent playground, but with little knowledge of what kind of resources and material was needed. The product concepts are based on novel, ill-defined and unarticulated market needs using technology new to the company.

Due to a situation with little meaningful feedback from the company the metaphor of the bubble is used as an illustration. This kind of situation in the pre-design process is usually described as chaotic, unpredictable and uncertain and therefore often leads to anxiety and frustration. The difficulties the team faces in trying to solve ill-defined problems in the new product development without having any customer requirement to support them, enhances this feeling. The team is “thrown into a pool to see if it can swim”. Considering the situation it is a surprise to see that the team has had positive experiences working with the task as well, for example: they are having fun, which many will argue is needed in innovative work. This paper explores how the team has tackled this alien situation, the feelings arising from it and its effect on the creative work.

The company took a big risk when starting this kind of new-to-the-world product development. Their expectations were high regarding the new possibilities the technology seemed to offer, and the working team was expected to achieve extraordinary results. In order to face these challenges, the organization had to create an environment for a radical innovation. This paper explores how this kind of team worked in practice to bridge the gap between traditional product development and technology integration. They needed connections to the various departments in the company while at the same time working independently in a bubble.

### **Introduction**

How can a small and medium sized enterprise (SME) encourage design driven innovation by integrating information technology and conventional products? This paper describes a case where a playground manufacturer set up a multidisciplinary, temporary rescue organisation to solve emerging design problems and how good atmosphere and organization were the key elements in achieving results.

Normally in new product development (NPD), temporary and explicitly sanctioned project teams are launched for a specific mission and are then dissolved. However, in new business opportunities, careful planning of the design project may not be possible and the design brief hard to define. Clark and Wheelwright (1992) call a planned autonomous project team a “tiger team” and Engwall and Svensson (2004) call an unplanned temporary team launched to solve an unforeseen problem a “cheetah team”. In this case, we call our organisation a “bubble team”. The metaphor of the bubble is used to illustrate a situation with no meaningful feedback from the

work ordering party and limited direct contact with the rest of the organization. The team can be said to be the fifth level in this company organization. (see Fig. 1)

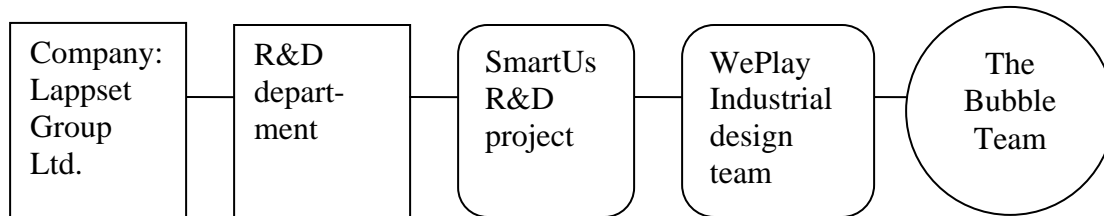


FIGURE. 1

The case is based on Smartus-project in Lappset Group Ltd. The family enterprise is a manufacturer of playground equipment with about 200 employees, an annual turnover of 33 M€ and extensive international exportation. Smartus is a collaboration project between Lappset and local universities and consists of several research projects from different disciplines: education, sport, information technology and industrial design. Together they are developing a new playground equipment collection where information technology is used to add value to new products. The first collection will be launched in 2006.

In the middle of the Smartus project (2003-2005) it became apparent that the existing organisation was unable to define meaningful technological functions and solutions. Thus the “bubble”-team was formed.

Johansson and Svengren (2004) point out that a critical mass of design resources are needed in order to achieve a strategic difference. Generally, for an SME, it is possible to use only a few external expert resources. A larger team of specialists can however make a substantial difference, for example, through long- and short term development projects, by facilitating the designers own professional development and by making design part of the organisational body. The cooperative learning process will be strengthened and the design concepts becomes more nuanced and enriched.

According to Petre (2004) a multi-disciplinary structure of design teams brings together different information sources, different methods and technologies, different representations, perspectives and fundamental principles. Petre (2004) lists several key characteristics of how companies support collaborative, multi-disciplinary teams. Typically only the good ideas are remembered, not the failures. Recognition is given to all levels of the team, and managers are active in the design projects. The people generating the ideas are usually the ones who follow them through, contributing to continuity in the process.

Jevnaker (2000) explains how a company may experience increasing returns by making new design more valuable and meaningful. She claims there are three important elements in doing this: integration of competencies as a dynamic, rather than a linear, process; relationship building and repeated investments in creative design opportunities. For Lappset, one alternative way of achieving this would be the bubble team.

## **Case story**

### **The start**

In June 2004 the company had a workshop where three research and design projects presented their results within pedagogy and play, technology and product design. The expectation was that the results would converge, forming the basis for a clear product solution. It was however very difficult to see a clear connection between the three, even though the projects had proceeded well with their own activities. They had also been collaborating with each other, but obviously without a shared vision.

During the workshop the participants failed to find the missing link between the projects, and it was very hard come up with something radically new in a few hours. People were perplexed and felt dissatisfied with the situation. Something had to be done. It was proposed to define characterizations for the problems which would then be systematically tackled. The description would be something like “we really hadn’t defined the final functions which take place in the target environment”. A person from one of the projects was nominated to form a task force to define the functions. This was the birth of the team under discussion.

### **1st work phase, from mid June to mid October,**

The work started with three people from different disciplines (education and information technology), and a normal project plan defining the goal and the time schedule. The team was working in separate rooms in the Lappset R&D department, and had their meeting in one of the larger offices, but would seldom consult the engineers. The goal was only to define the functions, not to implement an execution environment for the functions. The team had weekly administrative team meetings and workshops. In the administrative team meetings the status of the efforts were recorded and stored in the company’s file system. All the written information had to be shared via e-mail, since only the team leader had access to the company file system. This remained the convention until March next year, when the information was put in a password protected file server.

The team had several brainstorming sessions in the beginning. In these sessions it was prohibited to think about technological restrictions, as this had been a barrier for creative thinking in previous discussions. The restrictions kept surfacing even so, and the team members constantly had to remind each other not to worry about them. Ideas for different functions were written on a large sheet of paper which was pinned to the wall. There were 98 separate ideas or concepts, and based on these the team started to define scenarios. During this time the team got international reinforcement of yet another discipline, industrial design. The new team member brought a new and fresh perspective to the scenario development work. By mid October a set of final scenarios were ready for presentation.

These scenarios were presented in a meeting to the management and an acceptance or directive comments were expected. The atmosphere in the meeting could be summed up in one word – hesitation. Although the management had a positive attitude, the concepts did not get unreserved acceptance.

### **The 2<sup>nd</sup> work phase, from mid October till the introduction of the final solutions**

The time from mid October till the end of the year can be depicted as a period of anxiety. The concepts were still very open and they would need a new, rather extensive technological infrastructure. The team were not capable of making prototypes to test even the simplest

scenarios and expressed its concern about missing human resources. The work was not any more organized than it used to be. Most of the team's effort was spent on designing and managing a spin off product, which was to be used in exhibitions, demonstrating one selected technology function. At the end of the year the team received two new members, an interface designer and a software engineer. This proved to be the turning point in the project. The critical mass of necessary people was reached. In addition, two designers from Lappset were participating in the teamwork and the active team now counted eight persons, an it-expert (the leader), two educational experts, an industrial designer/researcher, an interface designer, a software engineer and two industrial designers from Lappset.

In the beginning of the year the new team members familiarised themselves with the previous results and the whole team defined a new working process, which was to be used from now on. This involved a regular meeting convention and that all meeting and design material was stored in a manageable and accessible manner. Now the team started to produce new ideas, and these were implemented and tested with real end users. The company management started to believe in the achievements and wanted to test the solutions themselves after hearing positive feedback about the concepts.

Until very late the team members felt they had worked in a kind of submarine or bubble project. Nobody knew exactly what "the thing" which was being developed was - it took a long time for the team itself to figure that out. The communication between the company and the team mainly happened through the team leader. This was the case both regarding the work results and about peoples' roles and tasks in the team. Every time the functional solutions were presented to people outside the team, the audience was sceptic about the feasibility. Testing the solutions, which happened quite late, made people think differently and this was quite encouraging. Despite all seemingly frustrating factors the team maintained a surprisingly high internal enthusiasm. The team meetings were always filled with laughter and pleasant joking.

## **Experiences from the project**

### **The team's experiences**

The team members were asked to complete a questionnaire to give us a deeper understanding of how they see the team and its strengths and weaknesses. When asked to define the goals of the project, the answers were very much like vision statements. Almost all the members underline multi-disciplinarity, the phrasing makes it sound like it is almost a goal in itself and they seem to be very aware how they differ from other working groups. In addition to the multi-disciplinarity, the most valued features of the team were the systematic organization and the good atmosphere.

The feelings about how the group has worked are in general very positive, and there seems to be a strong consensus about which aspects of the work has been successful, and which could have been better. The good atmosphere was pointed out, as well as the group's ability to stay open to new ideas. Another aspect was the efficient documentation and organization of the group. This seems to have been a key factor for the team's progression with the development and seems to have instilled in them a feeling of control and repose. Information sharing with the rest of the organization was, on the other hand, commented by most of them as a weak point.

The team members were asked to rate different aspects of the groups work from 1 to 7, and the results were in some cases converging, other times more disparate. All in all they showed that the

team members feel quite confident about the results of their work although they are able to be critical of themselves.

### **The management's experiences**

In addition to the questionnaire, an interview of the SmartUs project manager and the R&D manager in the Lappset Group was arranged. They provided interesting and versatile information about how the work and the results in the team were seen from the outsiders' point of view. Both respondents appreciated the work very much. According to them, the team had succeeded in integrating elements from both technology and play equipment production, into the objectives coming from the social and educational challenges. They had made it possible to bring the multiple research findings to the product development in a way that opened new perspectives and enlarged the scope of the products and possible new markets for the company. Both managers admitted that without the team there would not exist a concrete product solution.

The managers found it preferable that this kind of team should not be part of the company in the phase of processing the ideas and the concepts. Working as an independent unit, the team has had more room to let ideas ripen and develop concepts without a pressure that could have disturbed the creative atmosphere. The management have been discussing hiring the team as permanent staff, and this was mentioned again in this interview.

The managers also stressed the importance of sharing information and suggested that the team should have used more explicit strategies for communication. At the same time they agreed that this could have disturbed the process. They introduced the idea of roadmaps where all the different ideas and solutions are presented in a timely and organized manner to help the idea processing and placing the solutions in the product development map.

Petre (2004) argues that in supportive cultures in exceptional companies managers are often committed to and involved in innovation and reflective practice of design work, as opposed to less exceptional companies where managers often are divorced from the design process. However, in our research it has been pointed out that the design team has managed to tackle the varied and undefined challenges and to produce concrete solutions, as well as creating a fruitful working culture inside the company without the managers being involved. In addition, it is seen worthwhile to differentiate the unit responsible of design work from the company with this kind of open and large scale design issues.

### **Conclusions**

Starting a completely new to the world project development is always risky business. Expectations in the company management are high regarding the new possibilities the technology seems to offer and the working team is expected to achieve remarkable results.

Technology is a pushing factor in all areas of society, and business and organizations are increasingly forced to expand their product range to also include technology products. An SME company with a conventional R&D approach needs extra support in order to integrate technology into their products. When there is little experience within the new field, there is a need for a team that can bridge the gap, a multi-disciplinary team with strong connections to the various departments in the company as well as to the external forces needed. For most SMEs, the government funding is critical for creating knowledge in new product development.

The partly external, exploratory team, like the bubble team described earlier, can be one way to achieve higher levels in knowledge creation and new product development. Some of the characteristics of such a team can be drawn from the case described:

- The existence of such a team depends on the organization's willingness to progress into a new field. How much are they willing to invest?
- The team must live within the organization over time, but must also exist of externals.
- Their task is to explore and understand what is needed in order to take the leap.
- The team must have a permanent status but not be full time employed only within the team. Their success relies on the connection with the other projects in the organization.
- Specialists from different areas are needed, and they need to adapt their terminology and communication to a level common for all participants.
- Critical mass of staff is required in each phase of the product development.
- In order for the team to function, there must be a certain atmosphere of humour and flexibility. They must constantly "stretch" and this requires a positive attitude.
- High tolerance of ambiguity is necessary, or at least there needs to be staff members who can comfort those who don't have it.
- All material needs to be categorized and stored, otherwise you end up talking the same things over and over again (if you do so, it needs to be intentional).
- There is a need of work organizing experience to proceed in a controlled way, even though you don't know the final goal.

The bubble team was taken into a situation where it got the challenge to create a linkage between the tradition of the Lappset Group and the new and vaguely defined challenges coming from the new business task. Even though the task was very challenging and even difficult to tackle, the group managed to give stimulating suggestions and product solutions to the company and through that, it triggered the company to clarify the needs and objectives for a new business strategy.

A bubble is needed when there are no meaningful directives, work orders and feedback from the management. Even though information sharing is recognized as a weakness, some degree of temporary isolation is needed.

A disciplined and systematic organization of meetings and material makes the team members able to maintain a good spirit. It could be argued that because they feel in control, they are more relaxed socially.

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