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The Concept Design Team

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We consider a team to be the unit that creates concepts. Individuals, whether they are inventors, designers, design engineers or visionaries with remarkable skills from a variety of professional backgrounds, take on the role of team members in order to develop concepts. An organisation, however creative it may be, does not create concepts, but provides the environment for concept development and facilitates the process.

Why do we hold this view? The creativity and skills of talented and well-trained individuals are essential resources. The creative potential of organisations as whole, including all their members, is well-recognised but less widely used^[1]. The first and the most straightforward answer is that in all the cases we studied for this book, concepts were generated by teams. The second answer is that contemporary literature about products and innovation shares the same view. Professors Jonathan Cagan and Craig M. Vogel^[2] at Carnegie Mellon University highlight the importance of integrated product design where engineers, marketing experts and designers work in close cooperation to recognise product opportunities and transform them into products. The team has even been called the backbone of innovation^[3].

The size and set-up of the teams in our examples and in the relevant literature naturally vary considerably. In some cases a very small team has

been responsible for carrying out the vast majority of the activities of a concept project, while in others the process has involved almost the whole product creation organisation of the company or division or has even spread beyond that by involving experts from several organisations. Nevertheless, the tasks were carried out by teams of people who contributed their complementary knowledge, expertise and skills which together enabled the project to be completed. According to Katzenbach and Smith^[4] a team is “a small number of people with complementary skills who are committed to a common purpose, performance goals and approach for which they hold themselves mutually accountable”. This definition is also particularly appropriate for concept design teams.

There is a huge amount of literature about teams and team management. This chapter aims to give an overview of the team as a concept-generating unit by discussing the composition of a team, the roles of individuals in a team and the leadership challenges of a team. It will become clear that concept design teams and their requirements for their productive work are not in essence different from other teams that are responsible for creative problem-solving. However, in our attempt to describe concurrent concept design activities, the point of view of the main player – the team – must not be forgotten and therefore it is important to look closely at the role of the team.

2.1 Team members

When we speak about teams we are actually speaking about packages of complementary skills. The individuals may be talented, but if the skills within the team do not complement one another and correspond to the challenge faced by the team, their talent will be of limited effect. Even less important than individual excellence is the status or hierarchy within a team. If the team needs formal authority to be able to proceed or if the team members need authority to justify their opinions, very little can be expected from the project. Therefore, an efficient concept design team should consist of individuals with varied and complementary skills, who work together towards a shared goal without carrying too much extraneous baggage. They do not necessarily need to work for the same organisation, sit next to each other or already know the other team members, but this may be advantageous.

As a result the correct composition of team is a critical to successful concept design. The team must have sufficient expertise in the fundamental areas of the product that is being conceived, the right personalities and the skills to acquire the information needed to support the team's tasks, to creatively interpret the product and to realise the concepts. The key expertise must be available within the team, while more peripheral, supplementary contributions can be brought in as needed.

Even though different product categories and businesses naturally call for different competencies, there seem to be certain profiles that are required in most concept design teams. The available literature contains two main approaches to forming teams: one addresses the necessary professional expertise of the team members and the other looks at the individuals' problem-solving styles and social behaviour. The professional expertise approach usually requires engineering, marketing and design disciplines to be present (e.g. [2]) for generic new product design projects. For more focused projects the composition may be different. In user interface and interaction design, engineers and designers work together with psychologists and social scientists (e.g. [5]).

There are numerous models for psychological screening criteria to ensure a good combination of problem-solving styles in a product development team^[6]. The models categorise individuals on the basis of their psychological characteristics to allow managers to put together a team with the right balance in several dimensions. Extrovert, action-oriented team members should be balanced with those with a more introverted approach who prefer to complete tasks on their own. Analytical thinkers, who need to understand the reasons behind an action, should not dominate or be dominated by intuitive team members who trust their insight, whilst rushing after attractive but hopelessly complex options. Originators, who bring in new ideas and introduce radical changes, should be complemented by conceivers, who prefer more gradual improvements and want to bring projects to a successful conclusion. The different styles of the team members should complement each other in the same way as their professional backgrounds. Productive tension between the team members with different styles is often seen as a necessary component for innovation.

A third approach to identifying concept team members, in addition to their educational backgrounds or business functions and personalities, is their responsibility within the project. The team members can be categorised

by the role they play in the project. A role is something that an individual can adopt for a specific purpose or within a specific context, assuming that he or she has the necessary qualifications. In different types of project the same individual can take on different roles. By choosing an alternative way of describing the team members, we are not implying that the other methods do not make excellent management tools. It is clear that specific educational backgrounds and personality traits are needed by people who take on certain roles. The roles in a concept design team are:

- user expert
- domain expert
- design expert
- communications expert
- feasibility specialist
- team leader

2.1.1 User research expert

The user-research¹ expert is responsible for ensuring that the team has an appropriate and adequate understanding of the user and the context in which the concept the team is designing will be used. In user-centred concept creation, in which by definition there is a continuous dialogue between the developer and user communities, this is a key role. (User orientation is covered in more detail in Chapter 4.) The concept development team cannot trust in and build on only an organisation's existing knowledge or on secondary information sources, such as research articles or commercially available trend forecasts. Instead, the team must have direct first-hand contact with

1 The terms used to describe the person for whom the future concept is intended varies depending on the point of view of the author and the relevant research tradition. "User", "customer" and "human" are the most commonly used expressions. "User" emphasises the interpretation of the person as someone who is in operational and goal-oriented interaction with the product, such as "uses" a mobile phone to call someone. "Customer" underlines the decision-making behaviour when purchasing a new product and the more long-term satisfaction with the product, where various issues that are not directly related to the attributes of the product may have an influence. A "customer" chooses the mobile phone but can become dissatisfied with it when her friends replace their phones with more impressive models. "Human" highlights a holistic perspective on the person for whom new products are designed. The problem with "human" is that it fails to explain the difference between the roles of different players in the concept design team (e.g. designers are also humans). Here we have chosen the term "user" because it defines the role of the person for whom the team is designing the concept with reference to the concept. User orientation in concept design is covered in more detail in Chapter 4.

the user community in order to learn in a focused way about users' needs and to create a channel for immediate responses. The user expert is not necessarily familiar with the specific users, practices, contexts or cultures of use in the current project, but he or she understands the methods and approaches used to gather the information. To make the project genuinely user-centred, the user expert must involve the whole team in the dialogue. Consequently, this expert must make an effort to help the team to create a communication link with the users and to interpret the data from several angles.

User experts can be psychologists, sociologists or anthropologists who are familiar with the product development environment. However, they are often also design engineers, product designers or interaction designers who specialise in user research or are familiar with usability design techniques. Analytical skills, excellent organisational capabilities and a certain amount of empathy are needed. For the users, the user expert is a newcomer who is learning about their world, whereas for the development organisation he or she is a messenger who is a living reminder of what is happening outside the team[7].

2.1.2 Domain expert

The domain expert is the person who is familiar with the activities, the products and the markets for existing products in the domain for which the concepts are being designed. Companies often have domain experts readily available in their marketing departments working as product or category managers or in customer service either in direct contact with the field themselves or at least with contacts within their customers' organisations. However, domain experts need to be found elsewhere when the concept design addresses completely new areas of business and human activity. Nurses and doctors can be domain experts for the design of medical equipment, while for sports equipment the experts may be professional athletes and serious amateur sportsmen. The domain expert works with the design team and shares the goals of the team. This is why his or her role is different from that of a user, whose needs are studied by applying user research techniques and who is not a member of the team. In integrated co-design practices the role of the domain expert and the user can merge.

Domain experts have a considerable amount of knowledge of the activities and culture within which the design will be positioned. However,

trusting a single person to represent the user communities is always a questionable approach. This is why the essential role of the domain experts is to work together with the user expert and act as a guide to the new cultures and human activities. They indicate where to find the lead users and other essential information sources. They know how to frame the user research objectives so that they make sense from the point of view of the specific practices of the activity. The sports-monitor manufacturer Suunto Oy has chosen the strategy of “hobbyism”^[8], which means that the company recruits new employees based on their expertise and encourages existing employees to take the role of the domain expert by becoming deeply involved in certain sports that the company considers relevant. Consequently, the company employs top-level international and national athletes as designers and product managers for their diving, sailing and hiking monitors, which allows the company immediate access to the culture of the sport.

2.1.3 Design expert

The design expert is a professional whose core expertise lies in generating solutions, which may be formulated as product structures, product appearance or interaction. The professional background of the design expert is typically in design engineering, industrial design or interaction design.

One of the most difficult and poorly understood phases of new product development (NPD) is the step from recognised requirements to proposed solutions – the leap from analysis to synthesis. This is where designers’ visual presentation skills, enthusiasm for new approaches and ideas and ability to think in terms of concrete solutions become important.

The design expert contributes by generating the solutions. He or she gives a concrete form, order or structure to something that has been an abstraction or, strangely enough, that has not existed in any form before the act of visualisation has defined it. This process of concretisation causes it to come into existence. In order for this to happen it is not sufficient to simply provide the premises. The act of presenting the solution also requires the designer to introduce something extra from his or her own insight and experience. Design experts probably do not have more insight or expertise than anybody else, but they are trained to trust their intuition and act on the basis of the knowledge that they have. This is why they are typically more confident about presenting solutions for which there are only partial justifications. However, designers do not have a monopoly on proposing

solutions; all the other team members obviously share the responsibility for bringing up new ideas. Therefore perhaps the most challenging task for an effective design expert is not only to be able to design, but also to enable the other team members to design, to make the whole team design and to turn a research or engineering project into a productive design project. This can be done by producing presentations that everyone can comment on, experiment with and improve. A good design expert helps the whole team to solve problems.

2.1.4 Communications expert

The role of the communications expert is closely linked to that of the designer, but is not identical to it. Whilst the design expert creates the rough mock-ups and sketches for internal problem-solving within the project, the communications expert creates deliverables that communicate the features of the concept to outsiders. He or she prepares convincing, attractive project deliverables, including storyboards, scenarios, 3D models and renderings, photographs of the models, interactive simulations, presentation slides, web sites and trade fair stands. Several of the objectives associated with conceiving can only be achieved after the concepts become well known, so a publicity campaign is often essential. The skills required may include a wide range of traditional and computer-aided visualisation and model-making skills. The task of creating the deliverables is often more than one person can handle. Fortunately it is easier to supplement the core-team's expertise when it comes to planning and implementing the communications than it is in other areas.

2.1.5 Feasibility specialist

The feasibility specialist ensures that the concept design team is aware of the technical restrictions and emerging opportunities. When the concept generation process is technology-driven, the technology expert, or in fact a technology subteam made up of several experts, takes the key role in driving the process. In more user-centred approaches the feasibility specialist provides knowledge about current and forthcoming implementation options and carries out an initial feasibility study on the options that have been created.

2.1.6 Team leader

The team's commitment to its goals and its desire to succeed depends to a great extent on the team's internal dynamics. It is possible to produce favourable conditions, create an inspirational mood and generate motivation by leading the process. The leader of the team plays a key role in this respect. The right kind of guidance and the right conditions can also reduce friction, such as unnecessary disputes about irrelevant issues based on personal opinions and egos – this sort of dispute can easily arise in a self-directed team. The leader's other main responsibility is to network the project with other relevant projects, communicate with the stakeholders whose commitment and decisions are important for ensuring the continuation of the project and at the end to continue processing the results. The third responsibility of the leader is to act as an integrator and ensure that all the important issues have been taken into consideration. Therefore, the leader must have an excellent understanding of and a good grip on the project as a whole. The educational background of a concept design team leader depends on the subject of the project. Professional managers are probably the best choice for complex, large-scale projects. Engineers are more suitable for technology-driven projects and designers for projects where the user interaction is the main challenge^[9]. For visionary and risky projects, the passion of the project leader is an essential resource; the person most likely to be passionate about the project is its originator^[6].

2.1.7 Setting up a concepting team

As described above, there are quite a few skills and roles that are essential to a concepting team, and several of them are broad enough to require a team of their own – not just an individual expert. However, because concept design aims to describe a future product on a rather generic level, very detailed knowledge is not always needed. It is typical, especially in smaller teams, for one person to take on several roles. This is why generalists, multi-field experts and senior experts are good resources for concept design, even though their skills would not be sufficient for the final implementation. For instance, the same person can – and often does – assume the roles of design and communications expert. The domain expert can also network and facilitate team activities by taking the role of team leader.

Figure 2.1 provides a description of the teams that carried out the user-centred concept creation projects covered in detail in Chapter 4. The

Phillip Butt, Suunto

We are motivated by how we can deliver the “want-me factor”. This is question we hope all our products will ask the consumer, and it manifests itself in pride of ownership and a sense of satisfaction. Ultimately we want people to want our stuff.

Concept creation is executed in both long- and short-term initiatives with a definite emphasis towards the latter. The “official concept creation”, meaning those projects that have research status, tend to be technology-centric and the domain of a scientist. They would greatly benefit from the input of a multidisciplinary team that could contribute depth to the concept, possibly leading to surprising and unexpected manifestations. The design department contributes through user-centred concept creation studies, aesthetic and mechanical design, user-experience design, and more generally by knowing

the sports, the people and the business.

The concept creation initiatives I have personally been involved with include outlining a new business opportunity augmenting existing technological competencies, exploring the potential of a newly entered market that had questionable business fundamentals, an online survey that identified mass customisation preferences with our existing market and a study of a new consumption paradigm directly challenging the way we currently segment our offerings.

The number of times we have been misunderstood over what is conceptual and what is production-oriented is simply stunning. Without clear differentiation about the design intent there can be quite a few misunderstandings – these are avoidable.

Younghee Jung, Nokia

Creating concepts for human communication often requires us designers to keep our eyes on both the mundane aspects of life as well as the solemn academic theories. I always joke that my sources of inspiration range from *Cosmopolitan* to *The Economist* and Bonnie Nardi’s publications.

My responsibilities include identifying what to research on and design for, coordinating the direction and execution of user research by other experts, participating closely in the execution of user research and identifying constraints and trends in business and technology; and, in general, making sense of stuff.

Working in an environment full of technogeeks, we are often approached by people asking us to generate concepts while sitting in a 1-day workshop. A design concept is not born within the space of 1 day. But it is difficult to prove that ideas

that are designed are better.

We’ve created a concept that people can use while in face-to-face discussions. We created a set of user scenarios and ran focus groups. When they were presented with the scenarios, the focus group participants started to say “This is an insult to our social skills”. The facilitator did not understand the concept very well and because she was so embarrassed by the impassioned discussion, she did not want to continue. We had to look for another way.

Many people will need some convincing to understand the value – and the concept – of concept design. Sometimes it is not about innovation and creativity, but more about creating a sensible design that can be implemented. Sometimes it is all about finding a ground-breaking idea.

Jane Fulton Suri, IDEO

My role is primarily to tell stories and encourage others to tell stories too. These are stories about real people's behaviour and experiences now, and stories about a future where both the client company and its customers feel more effectively supported. From stories we discover patterns in behaviour, motivations, pleasures, frustrations and opportunities for technological developments to provide a better experience in the future. This is a way of helping teams uncover insights about humanly beneficial opportunities that lie ahead, and it often involves interacting directly and in context with a range of people who represent the edges and extremes in a particular domain.

What motivates me is simply the idea that design is an exciting creative activity that is all about exploring the abilities of technology and human imagination to make life better. For me it is

important that conceptual design is not just blue-sky thinking, but is rooted in the overlapping reality of human, business and technical possibilities.

One of the joys of my work is the privilege of learning about other people's worlds, especially the sense they make of technology systems that do not work perfectly for them, by designing their own surprising and delightful ad hoc solutions: a list of important phone numbers written with a permanent marker inside the cover of a flip-format mobile phone or discovering a magazine picture of a favourite television star that a girl propped up in front of her video recorder to remind her to record the show. She would never have learned to set the system to record automatically. These workaround solutions are amusing, memorable and very often convey important themes for conceptual design.

← ↑ FIGURE 2.1.

Concept design experts

number of participants, the scope and the scale of the projects vary considerably, but the same roles can be identified.

In Nokia's steering-wheel project (see Chapter 4, and [10]) for in-car product conceiving, there were domain experts who came from the company's two business units responsible for factory-installed car products and aftermarket accessories. Their role was to ensure that the requirements and practices of car manufacturing, supply and the accessory business were recognised. They also made sure that the results of the concept creation process were communicated within the business units to the people who needed the information. These people were relatively new to the organisation and hence were supported by more senior mentors.

The role of user experts was played by a mixed team of sociologists, psychologists and usability engineers from the company's research laboratories. They planned the user research and usability evaluations together with the domain experts. The domain experts, for instance, specified the geographical market areas where the studies were carried out, and the user

experts chose the methods and organised the field observations. The observations were interpreted in teams involving all the key roles.

The technological expertise for the project was provided mainly by product development engineers working for the business units. The user scenarios, physical designs and interaction were handled by senior industrial and interaction designers. These people also took part in the preparation of communications material, but the majority of this work was carried out by more junior designers, software specialists, graphic designers and model makers.

The project was led jointly by one of the domain specialists and the head designer. A total of around 20 people took part in the project, but the core team who worked throughout the 12-month project consisted of five people providing domain and design expertise. The involvement of the other people was necessary to provide the required expertise, to allow the project to be squeezed into the specified period of time, to improve the cooperation between the different units in the company and to share knowledge, because one of the units had recently been merged with the Nokia organisation.

In the four-wheel kick-bike project (see Chapter 4), the product development manager in the customer organisation was responsible for providing the domain expertise, the technological expertise and for leading the project. The consulting industrial designers simultaneously played the roles of user, design and communications experts. The aim was to create a picture of the factors critical to the success of the new type of product. Since the scope of the project included concept creation rather than a detailed product description, a senior industrial designer was also able to produce the structural solutions under guidance from the development manager.

2.2 Helping the team to work together

As we emphasised during the introduction of the team roles, it is essential for the experts to initially have good personal skills, but these skills must be developed so that they can be used within the team and eventually beyond it. This is the only way in which the interaction can be seamless and fluent, and by which a collection of experts can be transformed into a team capable of integrated development. For professionals – and designers in particular – whose expertise has traditionally been very tacit, this can be a major challenge. Below we will discuss three factors that may have an impact on the

team's cooperation, namely the working methods, physical premises, and the size of the team.

2.2.1 Methods for working together

Several interactive methods for creative teamwork already exist, and more are being developed in design research institutions. For the present purposes it is sufficient to mention that appropriate team-based approaches are available for:

- interpreting qualitative data
- building scenarios
- ideation
- evaluation

Some of these are introduced in Chapters 3 and 4.

A good teamwork approach enables the team members to contribute their personal insights and expertise no matter how quiet and reticent they are or, for example, how unconfident they are in using the language (e.g. the case of multinational teams). The methods must also enable the team to build on the individuals' contributions so that one idea or interpretation can be used as a stepping stone to another more advanced one. This is why team methods are typically combinations of individual and shared phases. Well-known examples of team methods that alternate between individual and team phases include heuristic evaluation^[11] and the affinity diagram^[12].

The approaches should also allow the teams to create a good balance between joint sessions and individual work outside the team meetings. Even though the advantages of team processes have been emphasised, teamwork multiplies the working time of an individual by the number of team members. One person-month of working hours can easily be spent in a couple of team workshops. Therefore, those parts of the design process that do not benefit from the team contribution need to be recognised and carried by individuals.

Within the industrial design community there is some mistrust of formal approaches that do not exactly match the designers' requirements. However, in the same team there may be individuals who can take comfort from well-defined approaches during the stressful concept creation process when the results are on the borderline of being achievable. Therefore, the methods should be clearly defined to give the guidance needed, but at the

same time they must be transparent in order to ensure that using the method does not become the primary focus of the work. The method should allow the team to follow the approach, but at the same time let the team and its individual members focus on the content of the project. The method must support the process without focusing too much attention on itself.

The methods should provide support for the creation of comprehensive and easily understandable documentation. Documentation plays an important role in the team by concretising the issues and providing a shared ground for reference, annotations, discussion and learning. After meetings and workshops, the documentation helps to remind the team members about the results of the meeting and the paths that they followed to achieve them. However, working documents are rarely of sufficient quality to be used as presentation material or sufficiently self-explanatory to be shown to people outside the team, but in the best case it should be possible to minimally edit them to produce formal documents. A research team at the University of Art and Design Helsinki, *Uiah* has experimented with video recording all the sessions of a user-centred concept design project. The video has turned out to be a useful tool for briefing new members who join the project about the earlier phases and the decisions that have led to the current project phase.

2.2.2 Physical premises

Concept design teams are expected to propose solutions that go beyond day-to-day engineering problem-solving. To achieve this demanding goal, teams need design premises that are appropriate for concept design. For example, Decathlon left the company premises and travelled to the Alps (see Chapter 3). Putting a physical distance between the team members and their desks, cubicles, hard drives, appointments and urgent e-mails makes it easier for them to leave disruptions behind and focus on creative work. The distance can also help team members to forget temporarily the company's segmentation models, style guides, technology platforms and all the other handy and effective methods for reusing current solutions. Practices that only permit the use of streamlined engineering processes for the on-schedule implementation of products can jeopardise the use of the imagination and the unconscious "tortoise mind"^[13]. In this mode of thinking, which is typical in concept creation, it is crucial to allow time for ideas to incubate and crystallise.

Unfortunately travelling to distant locations and dedicating longer periods of time to a single concept design project is often impossible; in fact the opposite seems to be typically the case. Product development resources are often tied to several projects running in parallel and some of these projects are in firefighting mode, which means that concepting simply has to give way. Consequently, concepting is fragmented over time, being carried out when the time allows. When time cannot be used to package the project and keep its activities coherent, other means, such as physical space, should be used for this purpose. Therefore, it is advantageous for the project to have an area where the project documents – mood boards, storyboards, sketches, flow diagrams, affinity diagrams, etc. – can stay hanging on the walls to remind team members about the previous steps taken and the solutions proposed by the project. These objects will also help team members to recall the working mood and spirit of the project when they come into the area. Entering a project area can help the team members to remember the unfinished problems and tune themselves into the project more easily than just finding the project folders in the group work application (which probably will also have to be done).

In the case of Ed-design, the managing director's office was used as the project area and the trend forecasts were put up on the walls. It may be that what was lost in terms of an informal and relaxed working atmosphere was regained by indicating management's commitment to the project.

2.2.3 Balancing the team size

An effective concept design team is not hierarchical; the members should be regarded as and act as equals and communicate directly with one another. The topics of discussion often include semi-formulated ideas, and more effort is needed to understand them than is involved in simply decoding the words. A mutual, shared basis for understanding has to be established and developed throughout the project as the ideas progress. And although shared practices decrease the effort required, a separate foundation needs to be laid for each of the mutual interpersonal relationships. The number of interpersonal relationships (N) in a team depends on the number of team members (n) according to the following formula $N=n(n-1)/2$. For a team of 4 members this gives 6 interpersonal relationships, for 5 members there are 10 relationships, and in a team of 8 members there are as many as 28 interpersonal relationships (see Figure 2.2). The likelihood of friction occurring

during communications obviously grows with the number of interpersonal relationships. Clearly this friction can be reduced, but a shared ground for understanding cannot be established and developed without effort. At some stage as the team grows bigger, the team building efforts go beyond reasonable bounds. When this happens the team starts to lose its dynamics. Some members' contributions are no longer used or the team may start to work as a hierarchical organisation where communication only follows certain established channels – leaders become managers and partners become suppliers.

Our experience and the above discussions about the necessary roles suggest that a team can easily grow in size. In a larger team, it is more difficult to agree on schedules, decision-making becomes more complicated and it takes longer to get on the same wavelength. In simple terms, the decision-making process becomes slower and less efficient. Therefore, bringing together a concepting team is a compromise between expertise and efficiency. For these practical reasons, the responsibility within a concepting team often lies with a core team consisting of only a few people. This core team is then supplemented with the necessary experts as the work progresses. Lindholm and Keinonen^[14] suggest that five members is optimal for a user-interface concepting team to make rapid progress.

A notable exception to the objective of making teams as small and efficient as possible is when learning cooperation and gaining the commitment of different stakeholders in an organisation is an important goal, as in the Ed-design and Decathlon cases (see Chapter 3).

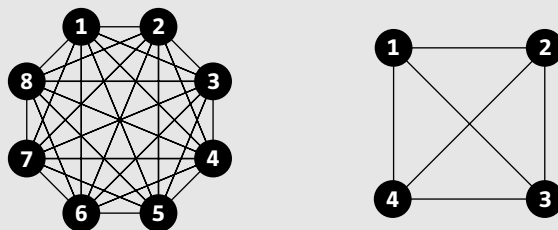


FIGURE 2.2.
Communication in teams of eight and four members

2.3 Briefing the team

A concept design team operating at the fuzzy front end of product and business development is a difficult unit to manage and control. The work typically starts with a loose brief and will end by producing something about which very little was known at the beginning. The team defines the goals, reformulates the questions and adjusts the methods and processes, depending on how the work proceeds. There are of course intermediate results that can be presented for review, but using those for project control purposes can be problematic, because their relationship to the original starting point and the final goal of the project may be redefined during the process. The nature of design problem-solving and the needs of control and management do not make a good combination.

A project plan, which is often obviously used as a planning, project management and control tool, in certain respects does not match well with the way in which concept design teams work. A plan gives the management and customers of the project confidence and security by defining how the project resources will be used and what can be expected as the output. For the team, the plan is in the best case a guess about the future of the project that gives directions and guidance, but in the worst case it is a promise and a chain that restricts the reframing of the goals on the basis of what has been learned earlier in the process. A plan created before the project has really started can hardly be expected to anticipate the challenges and opportunities that the work reveals. Sticking to the plan when the opportunities lie elsewhere is obviously a mistake. When project plans are reviewed from the control perspective outlined above, it is clear that a loose framework and flexible process models are needed to give the work some structure and to allow the resources and schedules to be managed effectively. These issues are discussed in Chapter 3.

Creativity in concept design requires the designer to move away from the design objective rather than focusing directly on the solution. It is impossible to produce new solutions unless the design objective can be seen in a new light. This in turn may require a comprehensive change of perspective. A metaphor frequently used is to take a step backwards to see the bigger picture before rushing forwards. Concepting also includes, for instance, the identification of user needs, technical factors, social values, company goals, the designer's own opinions, experiences, impressions and feelings, and the diverse requirements of the operating environment. Taking

these into consideration requires a broader perspective, as well as the use of different working methods and forms of expression in addition to the most direct and obvious ones.

In product development concepting (see Chapter 1), the briefing problems outlined above are perhaps slightly exaggerated. Product development concepts are created as part of a larger product development initiative, and the objectives and restrictions of the project also reflect on the concepting. This is why the factors that apply to briefing design assignments in general also apply to concepting for product development. A fresh introduction to the topic is provided by Peter L. Phillips^[15]. However, the challenges of briefing design teams for creating emerging and vision concepts still remain. How should teams that are expected to explore the unknown rather than achieve identifiable goals be briefed?

It is possible, though risky, to start a concept design project without a well-defined plan. Companies that are looking for new opportunities in unfamiliar areas that can turn out to be of significant strategic importance naturally should think twice before taking the chance of simply authorising a concept design team to do what they find interesting. Even in the most open design assignments there are factors that can be used to reveal the starting points for concepting and the process itself, to make it into a more understandable and less fuzzy activity. These include:

- Business strategy and the generic objectives of concepting
- Shared, motivating vision
- Joint management practices
- Trust

2.3.1 Business strategy and the generic objectives of concepting

The management decision that precedes the start of a concept design project is based on clear reasoning. The managers probably have some expectations about the results of the project, but they certainly know why they want to expend resources on something as risky as concept creation. There are always alternative ways to spend the money: launching another advertising campaign, replacing some of the machinery on the production line, etc. They need to justify the choice to their own superiors or shareholders. The reasons they apply are most likely to relate to long- or medium-term business objectives and strategies the company has or is seriously considering. These will obviously also help to keep the team on the relevant track.

Another approach to defining the goals of concept creation is to think about the types of benefits that concepting are expected to generate. Here the generic goals of concept design as identified in Chapter 1 can be used as a checklist. If the concept project is expected to fill an idea bank and file several patent applications, the process will probably differ from that of a project whose main goal is to generate new competences by learning a new technology or initiating cooperation with a recently acquired overseas division that is joining the company.

On the basis of our experience at UIAH, a dual agenda is not uncommon when concepting involves both private companies and public institutions. While the academic partner is working towards a far-reaching vision concept, the business partner may have more immediate expectations and work in parallel to achieve its short-term implementation aims.

In conclusion, the role of the concepting effort with reference to the company's business strategy and the types of goals expected from the project needs to be clarified at the start of the project.

2.3.2 Vision as a starting point for concepting

The initiative for starting a concepting project can be the need to fill a gaping hole in the product portfolio identified during a strategy review, to create a new solution made possible by technical progress or to fulfil identified user needs. However, concept design does not always start with a thorough analysis, nor is it always based on an undisputed scientific finding. The starting point can instead be an attractive idea or unclear opportunity, which offers grounds for further elaboration. It is easy to obtain the support of corporate management for an excellent idea and therefore to acquire the necessary resources for concepting. Typically, when the excellence of the idea is not as obvious, the project needs to be primed more carefully in order to get it off the ground. It must be possible to crystallise and communicate the vision of the concept so that it is easily embraced, stimulating and challenging, even if not much is yet known about its existence. A “soul” must be created for the concept, even though it still lacks a body.

Designing in order to fulfil someone's vision is a conflicting starting point for design. Many designers insist that design is a problem-solving profession where the only correct and acceptable way to start is from a problem statement. The vision-driven approach appears to conflict completely with this view. On the other hand the target-driven and reflective problem-solving

style of designers and the poorly defined nature of design problems tend to bring together the problems and solutions into a tightly packaged entity.

Expressing a good vision at the beginning of a project has several advantages. It can give the whole project a direction and goal that is expressed in a challenging way. It states what the project wants to achieve. When the vision is sufficiently open, it leaves room for the team's and the team members' individual interpretations, and thus allows them to make the project a personal challenge. For those people for whom design has to start from a problem statement, an imaginative vision can easily be turned into one. How can this be done? How would it function? What would be the consequences of this type of vision? A vision can also be used to sell the project to other people whose contribution is needed during the course of the project.

The tools that can be used to characterise the concept include metaphors, scenarios and design drivers^[14]. A good metaphor describes an idea in a few words, is easy to remember and to pass on, and is widely understandable. A simple and frequently used way to illustrate the nature of the concept idea is to compare the product to be conceptualised to products in another sector. In conjunction with Nokia's user-interface concepting, mobile phones have been compared to footwear and vehicles^[14]. The metaphor of a phone as a rubber boot or an aerobics trainer can easily be deciphered, perhaps not completely unambiguously, but it clearly guides the imagination. Where a metaphor most often refers to the product's physical and design characteristics, a story-like scenario easily illustrates the dimensions of the product's use and interaction. Metaphors and scenarios are stimulating and easily communicated. Design drivers, such as a requirement that the product must be operable with one hand, are more specific definitions of the targets. Drivers are important for putting the vision into specific terms. They specify the problem that will be solved during the concepting process and the information and experts needed to support the work. There can be several drivers which, if necessary, can indicate the different dimensions of the product being conceptualised. However, paying too much attention to trivial details is not advisable; concepting that starts with a few of the most fundamental objectives is more successful in optimising the major goals.

2.3.3 Ownerships in the concepting process

Phillips^[15] strongly stresses the importance of co-ownership in defining a design brief. This also applies to the design of emerging and vision concepts,



FIGURE 2.3.
Concept generation workshop
at GE Healthcare



and perhaps goes even further. The business strategies, generic goals of conceiving and driving visions must all be shared by all the key stakeholders. Because exploratory concept design projects should result in the problem statement or vision being readjusted on the basis of the flow or the intermediate results, it is not sufficient to reach an agreement once only. This needs to be negotiated repeatedly, and the communication between the project and the customers should approach a continuous flow of briefing and rebriefing. Obviously, in continuous dialogues the idea of defining a brief becomes vague and starts to be replaced simply by seamless cooperation between the stakeholders. The partner – or the customer in traditional business language – does not leave another partner – the supplier in traditional language – alone with the project, but continues to take an interest and make a contribution after the initiation and between the main checkpoints.

Large and long-term conceiving projects often consist of several phases, as many of our examples show, and more often than not the move to a new phase is accompanied by changes in the team. Some of the user experts may leave, and design specialists may join. Some of the designers may leave, and the technology specialists may start their feasibility studies and prototyping activities. In each of these phases someone who knows what has been done leaves, and someone joins who needs to understand how to continue. In each phase there is a need for the previous phase to brief the next one. In these situations, as in the initial briefing, a written report of the results and further actions is hardly sufficient. The briefing needs to take the form of a joint handover period where the premises for further work are interpreted jointly by the people who have created them and the people who will be using them in their future work. (See figure 2.3)

2.3.4 Trust

The need for formal definitions concerning the content and goals of design commissions is twofold: on one hand the understanding about the premises of a project needs to be shared, and on the other hand the formal brief acts as a document to which the partners can refer if future disagreements arise. The shared understanding does not necessarily need to take the form of a written contract, though obviously a written outline of some kind is needed. When the partners have mutual trust, the project does not need to be specified for control purposes. The customer of the concept design knows that the changes the conceiving team may make are based on good

reasoning. The customer is also aware of the high professional standards and innovativeness of the team. The customer knows that the team is able to produce premium-quality work without the need for a control mechanism. Correspondingly, the supplier trusts the client to have reasonable expectations and to understand if the most challenging aims turn out to be too demanding. Typically the trust is built up over previous joint projects with less freedom and less responsibility for the supplier and with more accurately defined control mechanisms.

2.4 Individual team members

In addition to taking on specific roles, team members also form part of an organisation and are faced with the expectations and requirements of that organisation. Creating something new requires tolerance of uncertainty and the confidence to operate with uncertainties. Challenging the existing solutions also involves challenging the person who presents them. The challenge includes emotional and motivational factors that incorporate the employee's entire identity. Keinonen^[16] describes his personal view of concepting as being the pursuit of the limits of credibility. The credibility of design solutions is pivotal in concepting. On the one hand, the team is in pursuit of something that is new and interesting, whilst on the other hand a sense of viability must be maintained. A lack of credibility in the solutions can also mean a lack of credibility in the creator. In concepting, the organisation must allow the individual to become sensitised to open observation and the free presentation of ideas. The support that the team can give to individuals and the team's ability to share the responsibility may turn out to be critical enablers of radically new ideas that challenge established beliefs and practices.

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