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## Conceptualising services –developing service concepts through AT-ONE

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### Summary

What are service design concepts in AT-ONE and how is the workshop process supporting the generation of these concepts?

Based on the ongoing AT-ONE project this paper will outline some of the main methodological and theoretical foundation for generating concepts for services seen from a design perspective. Through the use of a combination of the Vision-based approach (Lerdahl, 2001), the systems perspective and concept definitions (Keinonen & Takala, 2006) a service design concept definition is proposed. The main methods and approach from a design perspective regarding clustering (Tassoul & Buijs, 2006) and approach towards design are summarized to describe the overall approach towards conceptualization. The AT-ONE approach regarding the support tools for moving from ideas to concepts is reviewed. In the discussion the workshop results are compared with the Service Concept definition and AT-ONE workshops possibility to support the process of generating concepts. Furthermore the challenge of divergence in both process and content sets a challenge for process of clustering towards conceptualization. Together this points towards the limitation of the workshop setting being the ability to sets out directions for further conceptualization rather than actual concepts.

### Concept development

Services – a multitude of perspectives and aspects.

Services and product service systems poses a complex design “object” and can be approached with a variety of perspective focusing on different aspects of the service. A short review of some of many the aspects and approaches demonstrates the variety in level of abstraction, point of view and focus:

Focusing purely on the actions in the service, a main aspect could be service delivery and business management, where one *blueprints* the service (Schostack, 1984) and design the flow of actions and define the line of visibility – thus the front- and back office defining what the customer sees and what the support functions and actions are.

Focusing more on the tangibility of the service, the design and development of the included products can be a focus point for applying more traditional product development models. Expanding the view towards whom are involved, one could map the actors, their relations and the flow of the service and good, such as the system diagram in HiCS project (Manzini et al. 2004).

Including the user-oriented view point into the business strategy, the focus is on the alignment between the primary user needs and the primary offer of the service (Edvardsson and Olsson 1996) and subsequently aligning with the process of the company and the support systems.

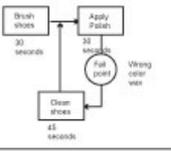
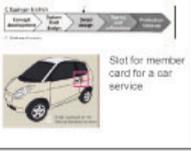
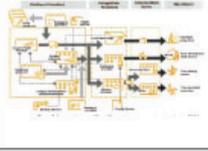
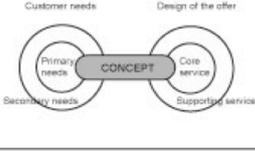
Focus	Service delivery	Products	Actor network	Offer and needs
Primary Service design aspect	Flow of actions Management point of view (p.o.v.)	Touch point - user p.ov. Functions - technical p.o.v.	Relations, flow and organisation. Management p.o.v.	User needs and primary offer of service. User p.o.v. & Business p.o.v.
Method/Model	Blueprinting 	Product development 	System diagram 	New service development 
Reference	Schostack	Ulrich & Eppinger 1995: "Process and Methods" Broe et al. 2003: "Car service"	Manzini et al. 2004	Edvardsson and Olsson 1996

Figure A. Examples of approaches towards designing services, from service delivery, to products, to mapping the system and aligning needs and offer.

The AT-ONE project is by using 5 aspects and focus points of approaching the development of new services (Actors, Touch points, Offering, Needs & Experience) attempting to cover some of the main aspects of services.

### Concept development – the design approach

The methodological approach to develop concepts are not necessarily related to the subject of what is developed, i.e. it may not be too relevant to distinguish between product and services on all levels of the development. Looking at the overall philosophy of approaching ideation and conceptualization of new solutions two main principles are evident:

The emotional approach – where the value and the experience of users are the focus of both divergent and convergent activities. The guideline is the vision, rather than the specifications. Examples on this approach is found in the Vision in Product (Hekkert 1997) and Staging for creative collaboration (Lerdahl 2001).

The rational approach – where a systematic development focus on the functionality and structure as a guide for divergent and convergent activities. Specifications are in focus for a systematic combination, such as morphological development, where the object is broken down into part functions and structure for development. The most common representative for this approach is the “Product Design” by Ulrich & Eppinger (1995).

Neither of these approaches are purely ascetic and does involve the other aspect to some extent. And a design approach needs to build a bridge between the two in order to design a holistic concept, where emotional and rational arguments are aligned and integrated into the concept. However concepts can be defined and used on many different levels of abstraction and used for a multitude of purposes as unfolded by Keinonen and Takala (2006); concept design for product development, innovation, shared vision, competence and expectation management.

There are some common features of concepts when one combine an abstraction level view, a system view and a context oriented view. In Lerhdals Vision pyramid (Lerdahl 2001) which is a further development of the Vision in Product approach (Hekkert 1997), the conceptual description is on a principal level, above material, but below the emotional aspects. However they are strongly connected (Tollestrup 2004) and the intended “role” and behavior” of a product can be linked to its functions and principles for their implementation. These principles can be seen as rules for characteristics or behavior of a product or service, which in itself can be seen as a Product Service System (Morelli 2003). Looking at this from a system approach, it is defined by its purpose, behavior or characteristics and it comprises of elements with internal relations and will always contain a view point (Andreasen 1980, Churchman 1968). In other words, a concept description will include the elements (not in detail) and their internal relations (structure), the purpose of the concept and an inherent view point.

Combining this with the context view the focus will first of all be the user point of view, users being the main objective for the design (Krippendorf 2006) and creation of value, and therefore also will be the means of evaluation for other stakeholders, such as the client/manufacturer. Regardless of the purpose for developing the concept Keinonen and Takala (2006) points towards 4 defining characteristics in a concept; Anticipatory (pointing toward the future), Well-founded (linked to user-needs and technology available), Focused (concentrating on main characteristics that differs the concept from others) and Understandable (to all stakeholders and usually using 3D, sketches, story boards, metaphors, etc.) and possibly summarizing this in a descriptive name for the concept.

A service concept based on these aspect can thus be defined as a coherent strong idea for a future desired state that contains:

- » A focused value statement – linked to strategies and users
- » Clear main principles – for functions, structure and actions
- » Clear main characteristics – for actors, offers and products
- »

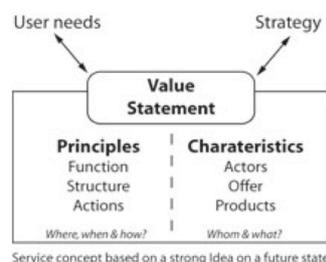


Figure B. A service design concept embracing the aspects of where, when and how by defining main principles and whom and what, by defining main characteristics.

All together expressed in a colloquial way using e.g. scenarios , service journeys, sketches, models, etc. to illustrate the above points.

The strong sense of direction for development allow for unfolding ideas and details following the same overall intention and value that is represented in the concept.

## Clustering as main tool for generating concepts

Generating ideas is a relatively easy task that can be supported by numerous techniques for opening the process for more divergent ideas. Many ideation phases result in a large number of ideas present at the conceptualization phase. This presents a well known challenge of convergence, narrowing down the number of ideas to continue with in the design process. The activity used in AT-ONE at this point is clustering (Tassoul & Buijs 2006), a bottom up process of letting the material “speak for itself” allowing the participants to search for patterns, similarity and familiarity without using predefined solution space or categories, but encouraging the use of metaphorical names for the clusters capturing the essence of their characteristics. Tassoul and Buijs suggest 4 different ways of clustering a set of “isolated ideas”; Object clustering, Morphological clustering, Functional clustering and Gestalt clustering. This covers the aspects from outlining the area covered by types (objects), subsystems (morphological), offers and actions (functions) and potential combinations supplementing each other (Gestalt).

It is about building a shared understanding and making sense of the material. Combined with predefined criteria, objectives, strategies and knowledge on user needs and context one can move from clusters to sorting out which ideas seems most relevant. This can be supported by reducing redundancy and creating representative ideas for a cluster before choosing relevant directions for further exploration and development.

The combination of a bottom up approach with an emphasis on characteristics is in line with the Value oriented aspect of the concept definition; “what characterizes the concept”, i.e. pointing towards the significance that sets this concept apart from others.

In the process towards conceptualization to main aspects of design approach is important to stress; abductive reasoning and reflective action.

First of all as Roozenburg and Eekels (1991) argue design reasoning is abductive. It is not hypothesis testing (deductive reasoning), nor a large set of inquiry forming a basis for arguments (inductive reasoning), rather designers starts with connecting apparently unrelated facts armed with a hunch that they may be related and both the solution and hypothesis derive as a result of connecting these facts. As Pierce introduced abductive reasoning the explained the difference as “Deduction proves that something must be; Induction shows that something actually is operative, abductive mere suggest that something may be” (Pierce in Cross 2006). This abductive approach of relating seemingly unrelated aspects is inherent in the clustering approach, especially in the Gestalt version and can also be explained with the designer connecting facts or aspects that are related on a higher level of abstraction, i.e. representing the same style of interaction or relation to the end-user, and therefore are aligned with each other, such as unfolded in the Vision and Value-based methodology (Lerdahl 2001, Tollestrup 2004).

The other significant aspect of the approach is the reflective action, as introduced by Schön (1983), where the designer engages in a dialogue with the material. In a team setting this implies the dialogue must be externalized; sketches or models for materialization, the material being the current suggestion for a solution. And precisely this solution to be representation is an inherent part of the design approach as Bryan Lawson explains in “How Designers Think” (Lawson 1980): “...designers learn about the problem as a result of trying out the solution.” And in this sense it is a double loop learning process (Argyris & Schön, 1978) prompting reflection through actions.

The abductive reasoning and reflective action approach sets a scene for conceptualization where the mindset for entering the process must be open to the extent that ideas are not taken for face-value but allowing for interpretation for higher level value or significance. And focus is both on trying out configuration as well as reflecting on the potential value of that particular configuration, along with possibilities for further development and change. All together a framework that is open-ended and forward looking.

AT-ONE is a cross disciplinary setting and therefore this design oriented approach must be adapted and made explicit for non-design participants. And the challenges of sketching and visualizing services (Morelli & Tollestrup 2007) must be met in a way that all participants can engage in the process. In the AT-ONE project, the main tool for materializing ideas has so far been sketches, but there are no methodological restrictions for the use of modeling, video sketching or other ways of documenting ideas. The limitation is merely practical, however favorable for participants with experience in expressing ideas through drawings. Therefore designers and design students usually are present for supporting the documentation process.

So far a number of methods and tools have been used in the AT-ONE process trying to link the ideation processes of each aspect to a later conceptualization phase.

## Tools and methods in AT-ONE

### Approach and process

The AT-ONE process is scalable from 2day workshop to a long term project. Applying the AT-ONE has so far been in a workshop format, either as a 2 day intense workshop or workshops for each of the 5 AT-ONE aspects successively. Following the ideation phase a workshop for conceptualisation is applied to define initial concepts that a smaller work group can develop and mature outside the workshop format. The tools and methods described here are concentrated in the conceptualisation workshop, where the shift from pure ideation towards identifying concepts occurs.

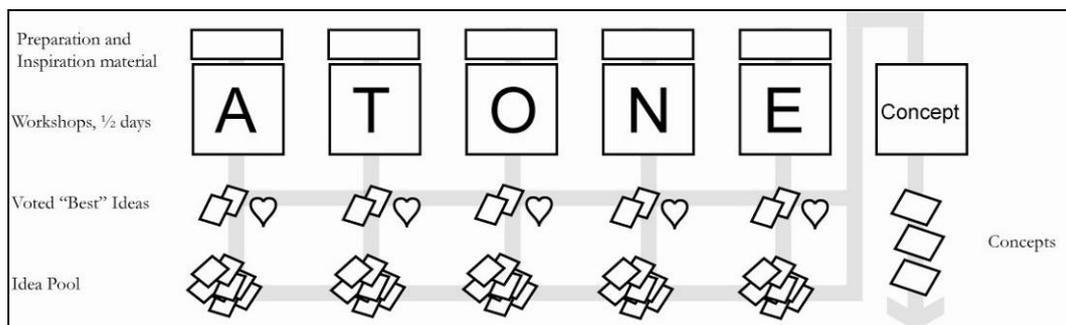


Figure C. For each workshop a number of ideas is produced and some are voted the best. However all ideas are used as a basis for the concept workshop.

### Templates for ideas, insights and concepts

During the Ideation part of the process a number of ideas were produced. For ideas to later be used in conceptualisation they must be documented and for that purpose a template were used to create Idea cards. Beside the documentation objective, the templates included aspect

of relevance and significance. Furthermore Insight-templates (also as cards) has been added to capture insights and learning points during the ideation workshop, that are not directly applicable to a solution, but rather a result of a reflection of trying out solutions. This is following the reflective action approach of the method.

For the conceptualisation part of the process, a Concept-template has been used also materialised as a card, but with 5 pages. The structure for the concept template itself is inspired by the aspects within AT-ONE, thus covering Actors, Touch Points (products), Offering (the service itself and the value it produces), Needs (of users) and the Experience (service journey). Besides these aspects, the template includes self-evaluation according to main objectives of the client in relation to the assignment, Name and keywords characterising the concept. The combination of describing structure and main elements of both actors and products with user needs and service journey (storyboard) together with a descriptive Name and highlighting the key value aims at covering the aspects of a Service concept described earlier.

### **Rating, voting and selecting**

The AT-ONE process involves several steps of rating, voting and selection of ideas. The first step is a self-rating on the Idea template, where the creator of the idea rate the idea through 5 ratio-oriented evaluations of generic character such as “value for user” and “match to Brand”. This prompts the creator for reflective action and points towards different aspects of the context for the idea. Part of the evaluation of ideas throughout the ideations phases are plenum voting activities and in addition to the pre-defined categories a number of hearts (1-5) are given to the “best” ideas. This very loose definition fits the abductive nature of the process (Roozenburg & Eekels 1991) and provides participants with an instrument of expression even if they cannot put it into words or the predefined categories.

The next step of evaluation is inherent in the concept template were 3 bullet-eye frames prompts the creator(s) to identify the degree and position of the concept proposal in relation to objectives stated by the company in relation to the assignment. The introduction of the objectives at this stage aims at preparing the conceptualisation process for the defining the value for stakeholders, as well as sharpening the focus (Keinonen and Takala 2006)

### **Clustering and sorting processes by post-it's**

Part of the initial conceptualisation is the clustering as described earlier. Some of the AT-ONE processes consist of full day workshops for each of the 5 aspects producing up till 200 ideas entering the clustering process.

In the process idea cards from all the previous workshops are placed in various piles and Post-it is used for naming clusters. As suggested by Tassoul and Buijs (2006) this process can be repeated through several runs and representative ideas put up front in order to make the ideas more accessible.

Throughout the process ideas that are too shallow in description or value can be sorted out reducing the number of ideas to manage for the team.

## Building the concept

As described in the clustering process, there is a short overlap between clustering activity and conceptualisation. The best way to describe the difference is probably the level of awareness of what connects the material, in other words the ability to make the abduction explicit.

Taking a point of departure in one or two strong ideas can be a starting point for building the concept configuration, either through developing the initial idea into all 5 aspects. Or by combining the initial idea with other ideas from the pool to form an even stronger idea (much like the Gestalt clustering activity).

Either way, the team must observe that they do not take the ideas as face value, but keep the focus on what could be, as they move forward trying to define and build the essence and focus point for the concept. In this phase having the material accessible is necessary for browsing through the remaining ideas for inspiration to expand or change the concept.

The intention of using templates for the concept is to facilitate the move from loosely connecting ideas towards a clearer and more focused activity. The relation to needs and strategy is introduced to ensure the concept is proposing a useful value for the main stakeholders. At the same time the limited space is to promote focus on main elements and characteristics.

## Using the AT-ONE tools and methods

### The process; variety and abundance

In the following examples from 2 cases are used. One is with one of the project partners in AT-ONE, the other with design students from the School of Architecture in Oslo (AHO). In the company case the long version of AT-ONE is used and a large number of ideas are produced (Fig D). The series of workshop performed with a company through sessions of approximately ½ day each produced 144 ideas total. The variance of the output of from the different focus was relatively small; A: 23,5%, T: 18,8%, O:25,0%, N: 16,0%, E:16,7% suggesting almost even production for each aspect.



Figure D. Design Students at AHO revisiting the large pool of ideas produced during ideation workshops before commencing the clustering process.

Having produced such a large number of ideas made the clustering process slow and long, taking a large part of the conceptualization phase. In the AHO workshop 2½ day was allocated to conceptualization and about half the time went with clustering and sorting ideas.

Separation in time between generating the ideas and using them as basis for concepts means that the team must invest time in re-understanding the idea before putting it into a cluster. Even though all ideation sessions were closed with a plenum rating selecting the top5 ideas by voting with “hearts”, it did not seem to make any difference in the sorting and clustering process.

### Templates; time vs. depth

Part of the clustering activity is spend with understanding what the sketch and notes are about, both content wise and target wise. What is it and who is it for? Sketches created in few minutes in one setting on the background of one discussion, may prove difficult to understand later on in another setting and with a different objective.

Many idea cards contain a shallow description of the idea and with no or very little context information (see Fig.E).

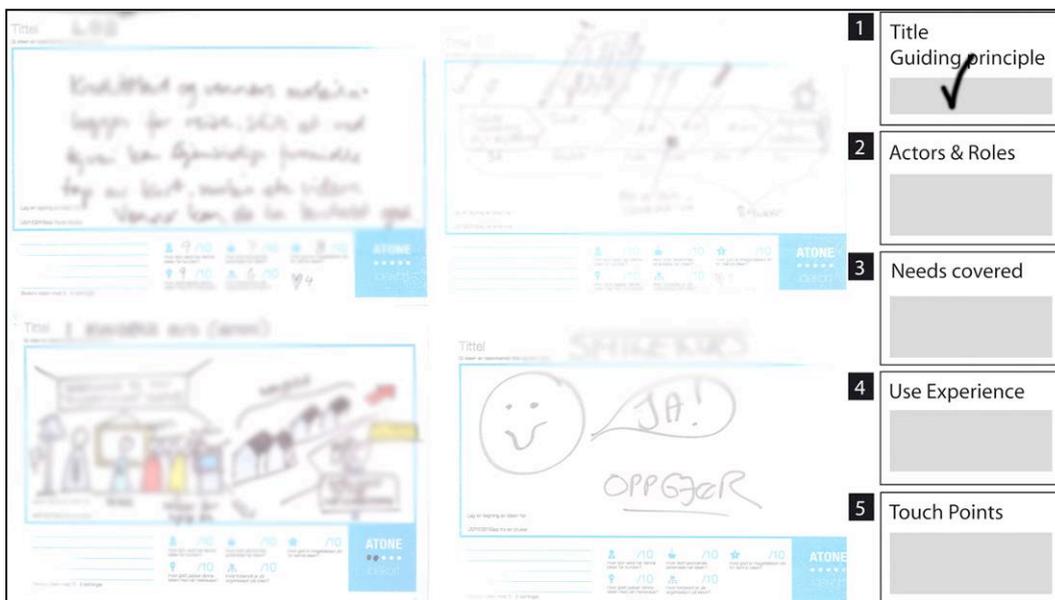


Figure E. Examples on diversity level and description intensity in Ideas that shall form the basis for conceptualisation through clustering. Ranging from text based only to just a simple drawing with no contextual reference. Examples are from a company workshop and blurred for confidentiality. The first page of the 5 page template was used, the rest was more or less ignored.

Furthermore the overall assignment that aims towards a broader frame for innovation means that ideas can be in many different product and service categories and within very different aspects of ways to organize the service, major new products, minor details in existing offerings, new type of offering, roles and actions, etc. A natural consequence of opening the AT-ONE aspects in the ideation phases.

Testing the concept cards in a 3 hour workshop with one company proved that besides the time issue of revisiting the ideas, the 4 page concept cards were not filled out. The focus was mainly on the front page .

Workshops with AHO students supports this tendency of focusing on the front page and service journey, almost reducing the concept description to the level of the idea card, but with a stronger link to strategy and emotional keywords.

### **Strategy and emotional arguments as clustering objective**

The clustering activities used in the AT-ONE can be difficult for the participants to perform, partly due to the sheer number of ideas, partly because of the above described problem of variety in abstraction, content and target.

To counter that issue in the AHO workshop a stronger emphasis on strategies was introduced to provide focal points for developing concepts. In an attempt to gestalt cluster a linking exercise was used to link strategies for the company, both stated strategies from the company itself and strategies proposed by students based on the activities in the previous workshops, with emotional arguments for users to engage with the company. Finally this should be linked to concrete principles for what the service should do, thus making a basis for a screening of the ideas identifying fits between concrete idea, principle, emotions and strategy (Fig. F). This follows the alignment logic of the Vision based model (Lerdahl 2001), but is not a bottom up clustering. When pointing towards the main principles, the ideas was to enable the students to abstract from the ideas and not use the ideas “as is” (face value) but focusing on what “could be”. Furthermore the explicit way of linking is a way of promoting a joint reflective activity in the team as part of the design process of learning about the problem, in this case the potential directions and emotional argument to meet the target group.

Even though the linking attempts to reduce an intuitive task to logical reflective steps, it is still very much a matter of interpretation and depends on participants to be familiar with and capable of dealing with several things; the various level of abstraction, the ability to interpret (not to take an idea for face value) and a strong sense of value for the user and other stakeholders.



Figure F. A matrix for connecting Strategy, Emotional arguments and main principles of the service.

### Building concepts in a short period of time is difficult

In the workshop settings so far the work done on concepts is limited to navigating ideas against strategies and identifying the best ideas, their key value and potential working principles. Nor the templates, free sketching or attempts to enforce a step-by-step concept development has proven successful in creating fully described concepts at the end of the sessions. Several reasons could influence this; the difficulty in creating concepts in a team setting as a plenum activity, the complexity of a service description, the in-experienced participants - either inexperienced design students or participants with no design experience.

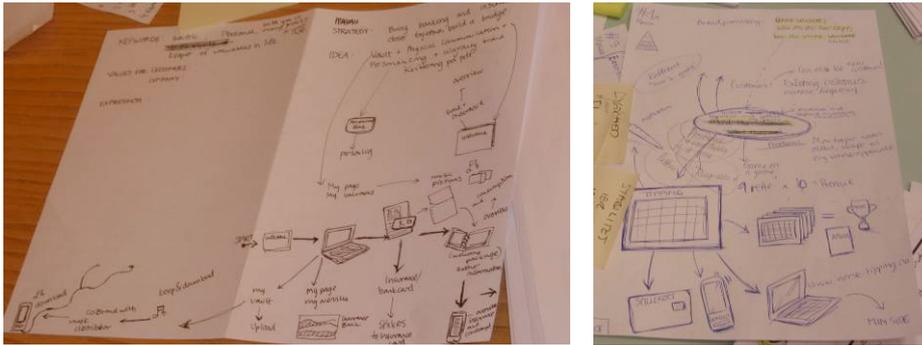


Figure G. Examples on the level of description of concepts reached in a concept workshop (from AHO, Oslo).

Also the circumstances of having a very broad and sketchy defined assignment may not provide the teams with adequate sense of “right or wrong” in the company context, finally insight into users and their values is essential for every reflective step along the process in order to establish an understanding of the potential of an idea.

The output of the workshop session on concepts are more like ideas from the Idea Cards with keywords for value and strategy added and described with a few more details, rather than actual concepts (Fig. G). They provide the initial links between strategies of the company, which make it relevant and anticipatory, to the emotions and value of the users, providing foundation, and with the main offering and key principles providing a focus.

However not reaching fully described concepts, the participating researchers, companies and students still express satisfaction with the results in terms of identifying potential concepts.

## Discussion

The AT-ONE approach provides a solid basis for ideation including many of the different aspects in the describing a service, as well as providing numerous ideas as foundation for creating concepts.

Revisiting the definition of the service concepts and comparing it to the results of the workshops there seems to be a gap. A concept workshop does not produce well articulated and described concepts, rather stronger ideas that suggest a direction of development. Having defined the Service Concepts as containing a focused value statement, clear main principles for functions, structure and actions, and further describing clear main characteristics for actors, offers and products – it seems as the concepts produced in the workshops only cover some of these areas. Linking emotional arguments to strategies can be seen as a way to focus the value statement, this can be found in the Naming of the concept and the keywords used to describe it. The clear principles and characteristics are however not present in a large scale, suggesting that it takes more time, development and consideration than provided in the workshop setting. As defined earlier the abductive nature of design (Roozenburg and Eekels 1997) sets a scene for conceptualisation where the purpose (and problem) as well as the content simultaneously can be changed and reconfigured. A process that may require more time to reflection than provided in the AT-ONE workshops. Other issues such as skills and competencies may also be important factors, but since the AT-ONE approach is trans disciplinary, the setting for conceptualisation should aim to involve non-designers on an equal basis. Perhaps the step between the ideation phases and conceptualization should aim at identifying potential directions in which concept could

emerge. Thus in a less time consuming matter start the gestalt clustering activity trying to understand the focus for a possible concept, naming the “headline” for that direction. In other words trying to identify the focus and some key characteristics for a direction one could take an idea. The focus point and part of the value or key characteristics may be enough to set a basis for a later concept development, an activity not suited for a large plenum activity.

Another main challenge is aspect of divergence within ideas and as activity (free ideation) combined with separation in time and space creating a large number of very diverse ideas as a basis for the clustering process. It requires time and effort to revisit and understand the ideas in order to cluster them. The ideas may be only related to one aspect of the service, e.g. the actors or a simple product, or they may be larger, more inclusive and strategic oriented ideas. This is a challenge in the clustering process combined with the divergence in objective for the ideation and the open innovation approach setting a stage for potential change and reconfiguration on many different levels of abstraction.

Together with difficulty in moving from ideas to concepts due to the time constraints it seems that the short AT-ONE workshops are not able to generate full concepts, but can support the generation of potential directions for concept development that can be used in the later phases of the AT-ONE process where there is more time for development and detailed descriptions.

### **The key factors in conceptualization**

Summarizing the key factors in the conceptualization in AT-ONE from a design perspective there are a tool and a process emphasis.

The tool emphasis is about tangibility for both process and content. The tools are strengthening the ability to involve and communicate with all the stakeholders, which is necessary in developing services as a complex, cross disciplinary design object. Templates can be used to ensure the main aspects of the service are included, requiring both rational and emotional key words. A visual clustering process where ideas are positioned and linked allow for an analysis and synthesis including non-rational aspects.

The process emphasis is about defining the core and strength of an idea before developing it into a concept. Linking the key offer and value statement to the primary needs as a key to evaluate the potential of the idea and concept. Without the understanding of the essence of the idea, the definition of the key principles and key characteristics seems an overwhelming task. Understanding this strength also prompts a reflection for the user needs and strategy of the client, thus preparing the idea for conceptualisation.

The key in conceptualisation lies in the link between the abstract, relevant values and the concrete coherent principles and characteristics.

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