Designing a Municipality

Ulrik Jungersen[1], Poul Kyvsgaard Hansen[2]

[1]*Kolding Municipality, Denmark*
ulju@kolding.dk
[2]*Aalborg University, Denmark*
kyvs@production.aau.dk

Abstract
Can a municipality be designed? The municipality Kolding in the southern part of Denmark asked this question. The idea emerged as a response to a recognized need for new ways of branding and developing the municipality. It is an ongoing process that was kicked off in 2012 and this paper is therefore focusing primarily on the process of changing the perception of how to organize development in a municipality. The most important elements in transforming the whole development setup are described. Finally, a short case describing one of the significant results is included.

Keywords: Design Thinking, Social Innovation, Entrepreneurship

1 Introduction

Design is an ambiguous concept. The predominant idea that virtually anything can be designed tends to dilute the meaning of the concept, and therefore, a value-adding discussion needs to include not only a "what is" dimension but also a critical "how to" dimension. The purpose of this paper is to illustrate how design thinking can be applied to tasks and applications that are much broader than designing a physical product. Our aim is to demonstrate how an overall approach to design thinking can be applied to all relevant development activities of a municipality. The project is a full-scale and an ongoing activity so for the moment only initial results can be presented. However, all new initiatives are developed based on a comprehensive framework and the emergence and processes of the framework will be discussed as well.

2 Design Thinking

In 1969 Herbert Simon published his book "The Science of the Artificial" in which he distinguished between natural objects and phenomena and artificial objects and phenomena [1]. The artificial objects and phenomena result from some degree of human intervention in the natural world. Aimed at satisfying human purpose, these objects are not exempt from natural laws but are adapted to the environment in which they operate. Simon points out that these objects are conceived in the human activity called design and thereby he relates virtually any object and phenomena that surrounds us to the activity of design [1].

The initial ideas by Herbert Simon was adopted by Rolf Faste and developed while teaching at Stanford University in the 80s and 90s [2]. Based on this Faste's colleague David Kelly developed the design thinking concept for business purposes and founded the consultancy company IDEO that has been credited for a significant part of the initial commercial usage of the design thinking concept [3].

2.1 Design Thinking and traditional problem solving

One important driver for the work of Herbert Simon was the concept of complexity [1]. The increase of complexity in the surroundings as well as in the objects and phenomena that constitute solutions made traditional methods obsolete [4]. These traditional methods are informed by academic disciplines that emphasize insight into the classics of the particular discipline and follow a deductive reasoning approach. Historically, this type of approach has proven powerful from the time of the industrial revolution until present time. Snowden and Boone argue that this perception of problems relates to what might be characterized as complicated problems [5]. Complicated problems are problems in which the relationship between cause and effect can be revealed by analyses and application of expert knowledge. Decisions on how to deal with the problems will be based on the outcome of the analyses. More and more, the relationship between cause and effect is not easily determined, and in many cases, the logical explanation of the relationship only reveals itself while conducting retrospective analysis.

Complex problems are very different in nature compared to complicated problems. They are messier and more ambiguous; they are more interconnected with other problems; more likely to react in unpredictable non-linear ways; and more likely to produce unintended consequences [4].

The approaches of how to deal with complicated and complex problems are also very different. When dealing with complicated problems, the approach is described as a sequence of generic types of activities: *sense-analyse-respond*. Sensing is referring to the use of all senses to identify a given problem. When identified it is realized that the problem needs analysis in order to understand the cause relationship between the problem and the various features that impact the problem. The analysis will then support the decision on how to respond. This is in line with the whole establishment of the present academic tradition [4]. Most people are academically trained in various analysis techniques and these do to a large extent constitute the various academic disciplines.

When dealing with complex problems, the approach is described as a very different sequence of generic types of activities: *probe-sense-respond*. Since there are no immediate cause-effect relationships, there is a need to *probe* and *sense* whether this probe supports an explanation or provides a partial solution to the problem. If it supports it, it will be part of the subsequent *respond*.

The differences between the two approaches are significant. Given the fact that by far the most people are trained in the tradition of complicated problems, there are numerous methods that support solving this type of problems. Some of the consequences are that complex problems are treated as complicated problems and this leads to solutions that will not solve the real problems.

The traditional scientific methods assume that all parameters of a given problem can be thoroughly defined and mapped before proceeding with designing the solution. When

complexity increases the traditional approach is generally not applicable. The problems are not easily defined and the interplay between solutions and problems become dynamic in nature.

Traditional scientific methods are best described as sequential methods. Design Thinking methods are iterative in nature [6]. By taking an iterative approach, the parameters of the problem and possible solutions may be explored simultaneously. The iterative approach means that the process can start without preconceived problem definitions. An emerging potential solution might shed new light on the perception of the problem.

One interpretation is the traditional scientific methods rely mainly on analytical thinking whereas the Design Thinking methods rely mainly on synthesis. The terms analysis and synthesis come from Greek and literally mean "to loosen up" and "to put together" respectively. In general, analysis is defined as the procedure by which we break down an intellectual or substantial whole into parts or components. Synthesis is defined as the opposite procedure: to combine separate elements or components in order to form a coherent whole. However, analysis and synthesis, as scientific methods, always go hand in hand; they complement one another. Every synthesis is built upon the results of a preceding analysis, and every analysis requires a subsequent synthesis in order to verify and correct its results [7].

2.2 Elements in Design Thinking

Design Thinking has been widely accepted based on the premises that virtually anything can be designed. However, the popularity of the concept has also led to a very general definition that has limited value in a specific application context. Any organization that would like to apply the concept needs to develop an operational definition that fits the purpose.

The definition should ideally include [8]:
1. A map of the generic phases
2. A clarification of the professional competences
3. A listing of the operating principles or rules

The suggested phases varies according to different authors and practitioners. However, the phases concerning: *user understanding, ideation, prototyping, testing, detailed development, implementation,* and *learning* are common elements [10].

The definition of generic phases leads to professional competences that are needed in the associated processes. These competences are partly new competences compared to traditional engineering design disciplines and partly a higher degree of cross-disciplinary competences. Anthropology competences are new compared to traditional engineering design disciplines. They bring in new insight about observing human behavior and support a deeper understanding of how people interact physically and emotionally with products, services, and spaces [3].

Organizational engagement, knowledge sharing, and thereby decision opportunities seem to be strongly correlated with the existence of prototypes. The systematic use of prototypes is an essential competence in Design Thinking. In his book, Serious Play, Michael Schrage praises many aspects of physical prototypes and models for speeding up processes, and he mentions examples of great breakthroughs supported thereby [11]. Schrage argues against the common assumption that "great teams make prototypes" and suggests that instead one should realize that "prototypes make great teams." The making of great teams goes beyond the individual

team, but helps create teams out of people with different backgrounds by creating "shared space". Shared space is the common ground where people can meet on even terms and objectively discuss matters.

The ability to apply multiple viewpoints is another important Design Thinking competence, and the ability can also be measured as an essential part of the innovation capability of the organization [12]. In essence, this multiple viewpoint ability is a competence that requires methods to support communication and synthesis across traditional disciplinary borders.

The operating principles or rules can be seen as guiding for the mindset of an organization's Design Thinking activities. The specific formulations of these are highly individual and vary between organizations. Some are more comprehensive, e.g., the operating principles formulated by Gharajedaghi [10]:
1.   No problem or solution is valid free of context.
2.   Performance of a system is essentially design-driven. An order of magnitude improvement requires a redesign.
3.   To design is to choose rather than predict the future. The choice includes elements of desirability.
4.   A redesign should always deal with both implicit and explicit functions. Ignoring implicit functions would result in a situation where the operation was successful but the patient died.
5.   Design is an emergent outcome: its ultimate boundary, functions, structure, and processes evolve interactively. Designers must develop the confidence to define, redefine, and change the problem in light of the situation that emerges as the design activity evolves.
6.   Design thinking involves conceptual abstraction and active experimentation. It is as much an art as a science. A system designer should have the capacity for abstraction and sensitivity to be moved by the power of an idea.
7.   Design culture relies not so much on verbal, numerical, and literary modes of thinking and communicating, but on nonverbal modes. Sketches are a means of producing "reflective conjecture" and thus a dialog with the design subject.
8.   To design a social system is to produce a clear and explicit image of the desired outcome. It should remove the fear of the unknown. Motherhood statements will not do it.
9.   Design is the instrument of innovation. Innovation starts by questioning the sacred assumptions and denying the commonly accepted constraints with playful reflections on technology and market opportunities.
10. Finally, design thinking is the ability to differentiate and integrate at the same time. Design is the most effective tool of integration: to design is to create an integrated whole from differentiated parts.

In other cases the principles or rules are more vision inspired, e.g. the four rules formulated by Plattner [8]:
1.   The Human Rule: All Design Activity is Ultimately Social in Nature
2.   The Ambiguity Rule: Design Thinkers Must Preserve Ambiguity
3.   The Re-Design Rule: All Design is Re-Design
4.   The Tangibility Rule: Making Ideas Tangible Always Facilitates Communication

The similarity between these two examples is obvious, but essentially any organization that adopt Design Thinking needs to define their perception and definition of the phases, the essential competences needed, and the principles and rules that apply in their specific case.

In the following we will present a case of an organization that has adopted Design Thinking.

3 Design Thinking in Kolding Municipality

In 2010 Kolding Municipality situated in the Southern part of Denmark launched a survey to identify their public reputation among Danes. The questionnaire contained questions such as: How is Kolding recognized as a city where to live and work? The short version of the summary stated that Kolding is primarily known for its ancient 700 years old castle, Koldinghus. Furthermore, for its handball team, for hosting the Kolding School of Design, for hosting a branch of The University of Southern Denmark, and for its museum of modern art, Trapholt. 20% of the respondents would not recommend others to live or work in the city.

Structural analyses showed that there were a declining number of inhabitants, and that the business structure was rather vulnerable due to a high number of companies within transportation and logistics.

The various inputs raised a question about a "burning platform" and fueled a need for a review of the way the city was organized and branded.

3.1 Creating a new vision

In December 2012 Kolding Municipality published a new vision. The short version of the vision is "We Design for Life", and the more detailed version specifies where the effort is focused: "Together we design options for a better life through entrepreneurship, social development and education". These three themes, entrepreneurship, social innovation, education and a fourth theme, branding define the focal areas of the vision. The vision is based on a Design Thinking philosophy and the intention is to become a full scale Design Thinking society by 2022.

In the remaining part of this paper we will describe and analyze how such a vision is broken down into specific strategies and goals. What has happened since the launch of the vision? Have they been able to operationalize the initial ideas? How are they going to change the innovation culture and daily practice in a designerly way? How do such a decision affect a public organization?

3.2 The first steps

The initial background analysis revealed a need for change. The Mayor and the City Council held a competition between consultancy companies to define the future of the municipality. The winning consultancy company set up a process with five phases:
1. Framing of challenges and goals
2. Mapping of the authentic strengths of Kolding Municipality
3. Scenario building with key opinion leaders
4. Vision boards with more than 600 citizens
5. The implementation process

The winning consultancy company was fundamentally inspired by a Design Thinking methodology. Broadly, the process was driven by the principles defined by Gharajedaghi (see above in chapter 2.2) [10]. Most significantly were the application of anthropological methods

and the widespread engaging involvement of citizens and opinion leaders. These approaches gave very positive and creative inputs, and they were also significant different from the traditional approaches applied by the municipality management. As the process unfolded the idea of making Design Thinking a central element in the vision began to take shape.

The vision "We Design for Life" is about using design processes and design thinking as a tool to change Kolding from being a relatively unknown and generic municipality to being a branded design city and an attractive entrepreneurship municipality. The vision is about applying design as the common mental model that is used to create success for entrepreneurs, developing new social services and create a professional and social forum where design is the focus of the many activities taking place in cultural life, business life, educational life, elderly life.

In order to facilitate the implementation process a number of new organizational support units and changes were initiated:
1. Committee for the vision was established, the members of the comity: Director of the Municipality, Director of Business Service, Head of Design, and an internal design & management consultant.
2. Establishing a secretary for design, staffed with 4 employees
3. Head of Design was appointed with reference to the Municipality Director
4. Communication Department and Design Department moved into joint facilities.
5. Defining a strategy with 10 explicit initiatives to support implementing the vision
6. Establishing Stirring Committees and determine mandates for the 10 committees
7. Creating a visual model for the whole scenario

Most significantly the Design Office was established with a direct reference to the Municipality Director. This ensured that the Design Office would be involved in any strategic issue raised at the top management of the municipality.

The 10 initiatives that were initially formulated was a mix of foundations, events and strategic goals. The 10 initiatives were:
1. World Design Capital in 2018 - Design icons to the city/area
2. The visual identity, urban life, visibility, activities
3. Design Festival - international
4. New Design-business center in the Design City; venues between business, students and citizens
5. Kolding model: Development of version 3.0 business model for entrepreneurs.
6. Living Design Lab: A test and development laboratory for social innovation in collaboration with researchers
7. Municipality of Kolding takes the lead, including the vision spread out in the policies and strategies
8. Marketing of the brand Kolding
9. Design education and research "From diapers to Ph.D."
10. A vibrant city for students – Study life

In regards to the whole effort and initiative 7 in particular it was decided to clarify and develop the leadership foundation

3.3　Leadership foundation

Creating the leadership foundation lasted for a year, and the result was launched the first of marts 2014.

The design process produced four fundamental principles for leadership in the organization:

1. **Outlook**; defined as: "We interact with the world - e.g. in partnership with business, educational and research institutions, and when we see the world through the eyes of users"
2. **Productive Diversity**; defined as: "Differences is the foundation for innovation and development"
3. **Professionalism**; defined as: "We are professionally competent and take responsibility for both the demands of the community and the citizens situation"
4. **Design Driven Innovation**; defined as: "We aim at developing smart solutions and efficient use of our resources. We are brave and go to the edge of the known. We designer, visualize and convert new ideas into new solutions through design"

In development of the leadership foundation the four principles was translated into six essential competences:

1. Design leadership
2. Strategic leadership
3. Management of organization and operations
4. Managing people
5. Interpretation and communication
6. Yourself

These six competences was divided into to directions

1. What do the specific managing role need to master in terms of tasks and competences
2. What should the managing role prioritize in their efforts

Based on these parameters the management foundation was developed in details for the various management functions (managing managers, managing people) and organizational levels (top management, functional managers, department manages) of the municipality management.

3.4　Creating a design tool kit

While 250 leaders began the work creating a new leadership foundation, the design secretary developed and introduced a six phased design process as the overlaying structure for the development:

1. Discover
2. Ideation
3. Concept Development
4. Testing
5. Product development
6. Implementation.

This 6 step model is inspired by the IDEO innovation model [3]. Issues concerning the context of public management and public innovation culture have been addressed through a redesign of the well known industrial design process models into a design process model focusing on service design and social innovation. During this work some specific local choices have been made. The KK model (KK is an abbreviation of Kolding Municipality in

Danish) insists on a moderate stage gate approach. Every phase is organized through three similar steps defined by specific tools. These tools are organized in a collection of opening, structuring and closing tools. Before leaving one phase the model recommends a number of conclusions to ensure project progress and qualified decisions. The six steps of conclusion begin with a screening of the task, next conclusion or decision after the discovery phase is:

1. Defining problems next after the ideation
2. Description or catalog of ideas
3. Concepts
4. Prototypes
5. Product
6. Measurement of effect.

The model describe that iteration forth and back through the phases is normal and appreciated, when a decisions seems worthless or shows a fruitless value in the work of the coming phase.

An important element in the implementation process and a crucial element in influencing the organizational culture is the training effort. Training is seen as an ongoing effort that is not restricted to the initial implementation phases.

3.5   Training of employees

The key distinction between "what is" and "how to" has been addressed in the design and innovation course for 25 municipality employees. The course aims to give basic understanding in the praxis of design driven innovation. An initial distinction between technological- business- and design driven innovation was made to give a simple picture of the unique qualities of design praxis. Three headlines for this understanding were presented.

1. **Visualization**: the pictorial language as concretization of shared space and understanding and the visual form that is facilitating and communicating new products and services as successful as possible
2. **Prototyping:** complex problems and traditional analysis should be complemented by easy feed back systems and testing sessions - "fail fast, fail cheap and get on with it" [3]
3. **Holistic user orientation:** human centered design in the understanding that we see the human beings in the center off the process, not as consumers, but as individuals with common human preferences [13].

To clarify the individual competences and skills, the employees underwent a personal test and an interview session, mostly to identity if they possessed project leader competences and motivation. The course was divided in two steps over two months:

1. Course for design facilitators, 4 days
2. Course for design project leaders, 7 days

The courses were combined with home assignments.

The course is conducted by the internal Design Secretary and HR department. Three internal senior consultants including the Head of Design conducted the training. External lecturers and instructors were recruited from the Design School Kolding in combination with two professional design companies.

4   Case – A Care Center

One of the early and very tangible outcomes of the process in Kolding Municipality is the development of a new care center in the vicinity of Kolding. The development process has been informed by the Design driven approach as adopted by Kolding Municipality. For the first time in Denmark the care center has been developed in corporation between private companies and public institutions. The unique type of corporation is called PPP (Private-Public-Partnership) and includes construction of the care center, the provision of health care services, operation and maintenance of the building, administration of housing and participation in a development partnership in a 20 year period.

The new care center will house 60 assisted living facilities and six different types of housing with two or three compartments. In addition, it includes a Café with views and walkways towards the nearby creek and a wellness area. The local population will be able to take advantage of the facilities, and the intention is therefore that the new care center can become a meeting place, thus creating more daily life than known from traditional care centers.

Figure 1 Model view of the new Care Center in Kolding Municipality

The inspiration from the Design Thinking approach made it clear that the process should differ from traditional construction processes. Instead of the traditional set of specific requirements the starting point was 12 everyday stories of "the good elderly life". Everyday stories were created in a user-driven innovation process where residents, families, local communities, politicians, interest groups and employees across the municipality were involved.

The result of the process has led to a setup that differs significantly from other existing care centers in Denmark. Offerings at the care center are more flexible and are addressing not only elderly residents but also the local community. This is made possible by innovating on the process of the public – private cooperation. The learning from the development of this cooperation will have a significant impact on future projects.

The project has been fully approved by the municipality council and the new care center is expected to be ready for occupancy in February 2015.

5 Reflections and conclusion

Can a municipality be designed? This was the initial question of this paper, and can, furthermore, be seen as a more general question regarding the limitations of Design Thinking. The short answer is "yes" – a municipality can be designed. And apparently it makes sense for politicians, managers, and citizens. The processes associated with Design Thinking can be extracted to areas that are not normally seen as obvious focal areas.

However, there cannot yet be concluded much. The process is ongoing and only now the first results are emerging. The most critical decision seems to be the establishment of the Design Secretariat and the appointment of a Head of Design. In particular giving the Head of Design direct reference to the Municipality Director ensures that the initiative will continue to have high priority and that all ongoing discussions will be reviewed with a Design Thinking agenda.

References

[1]   Simon, H., "*The Sciences of the Artificial*", MIT Press, Cambridge, Mass, 1st edition, 1969

[2]   Faste, R., "Ambidextrous Thinking", in "*Innovations in Mechanical Engineering Curricula for the 1990s*", American Society of Mechanical Engineers, New York, November 1994.

[3]   Kelly, T., "*The Ten Faces of Innovation*", Currency Doubleday, 2005

[4]   Buchanan, D., "Wicked Problems in Design Thinking", *Design Issues*, Vol. 8, No. 2, Spring, pp. 5-21, 1992

[5]   Snowden, D.J., Boone, M., "A Leader's Framework for Decision Making", *Harvard Business Review*, November, pp. 69, 2007

[6]   Cross, N., "Designerly Ways of Knowing", *Design Studies*, Vol. 3, No. 4, pp. 221-227, 1982

[7]   Ritchey, T., "Analysis and Synthesis: On Scientific Method – Based on a study by Bernhard Riemann", *Systems Research*, Vol 8, No. 4, pp. 21-41, 1991

[8]   Plattner, H., Meinel, C, Leifer, L., "Design Thinking – Understand – Improve – Apply", Springer Verlag, 2011

[10]   Gharajedaghi, J., "*Systems Thinking: Managing Chaos and Complexity - A Platform for Designing Business Architecture*", Elsevier, Inc., 2011

[11]   Schrage, M., "*Serious Play – How the World's Best Companies Simulate to Innovate*" Harvard Business School Press, 2000

[12]   Francis, D., Bessant, J.: Targeting innovation and implications for capability development. *Technovision* 25, pp. 171-183, 2005

[13]   Norman, D., "*The Design of Everyday Things*", Doubleday, New York, 1990