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Creativity and Innovation in a Mid-Urban Size Learning Infrastructure – Designing Spaces for Thriving Innovation Communities

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1 ABSTRACT

This paper presents the design of an urban structure for about 1000-2000 persons originating primarily from the so-called creative class, a creative settlement. This settlement provides a smart working environment for innovation (driven companies) and start-ups, an area for high quality living as well as for leading edge education. Both, the theoretical concepts, their background, and the research-driven design process having lead to this creative settlement are presented. The methods applied in this approach include ethnographic methods, qualitative interviews, quantitative surveys as well as approaches from design thinking.

This paper represents a case study applying and explaining theoretical concepts from the Enabling Spaces approach. A balanced and sustainable research-based ecosystem integrating the poles of innovation/creativity, qualitative living, and high quality educational concepts and facilities is presented. This paper presents the basic concepts of a master plan for the creative settlement that is planned to be realized in Russia.

2 INTRODUCTION: AN ECOLOGY OF INNOVATION ARTIFACTS

The case study presented in this paper is based on an architectural and innovation project for a small urban settlement of about 20-40 hectares (1.000–2.000 inhabitants), which will be realized approximately 20 kilometers outside of major Russian cities. The goal is to develop a “creative settlement” as a resilient and self-sustaining innovation eco-system which is based on sound scientific research results. It represents an eco-system that is sustainable as it regenerates itself through its social design (people working and living there), as well as its knowledge and innovation processes (education, working/business). It provides an ecology of innovation artifacts (cf. Krippendorff 2006, 2011) with self-regulating the in-, through-, and out-flows of knowledge, people, innovations, discourses, etc.

At first, the client’s brief was to create a role model for a well-balanced integration of living, education, and work. However, during the research and design process, the “creative settlement“ emerged as a place fostering responsibility through people with an entrepreneurial and innovation-driven spirit—a place for people who inherently want to move things forward—with focus on the Russian context.

This project is the result of a cooperation in an transdisciplinary team of (both academic and business) innovation experts, architects, urban planners, cognitive scientists, a sociologist and psychologist, as well as an entrepreneur. As it was the goal to develop a radically new design, the project team itself approached the whole development as an innovation process, which is based on the concept of so called “Enabling-Spaces” (Peschl and Fundneider 2012, 2013)—this approach will be discussed in detail in the following sections.

The first part of this paper discusses the theoretical foundations of the Enabling Space approach and gives an introduction to the design process leading to such multidimensional spaces.

3 DESIGNING ENABLING SPACES

3.1 Enabling Spaces

Enabling spaces are spaces that are designed in such a way that they enable and support processes of collaborative knowledge creation and innovation. Enabling spaces try to give an answer to the question: How do we have to design environments that enable processes of bringing forth fundamental innovations and thriving social systems?

It will be shown that we have to apply a rather broad notion of space going far beyond architectural/physical space: several dimensions have to be considered including the social, cognitive, emotional, technological, epistemological, and organizational dimensions and aspects. Hence, in Enabling Spaces these dimensions have to be orchestrated and integrated in a highly interdisciplinary manner in order to support knowledge (creation) processes (see Peschl and Fundneider 2012, 2013 for details).

Space is understood as a container providing a set of (active and passive) constraints that are offering an enabling structure that is integrated with enabling process dynamics; they are allowing knowledge processes to flow and to develop their own dynamics in such a way that (radically) new knowledge may break forth. The challenge is to develop a stable design process integrating these dimensions into a holistic framework or ensemble, which functions as a coherent Enabling Space.

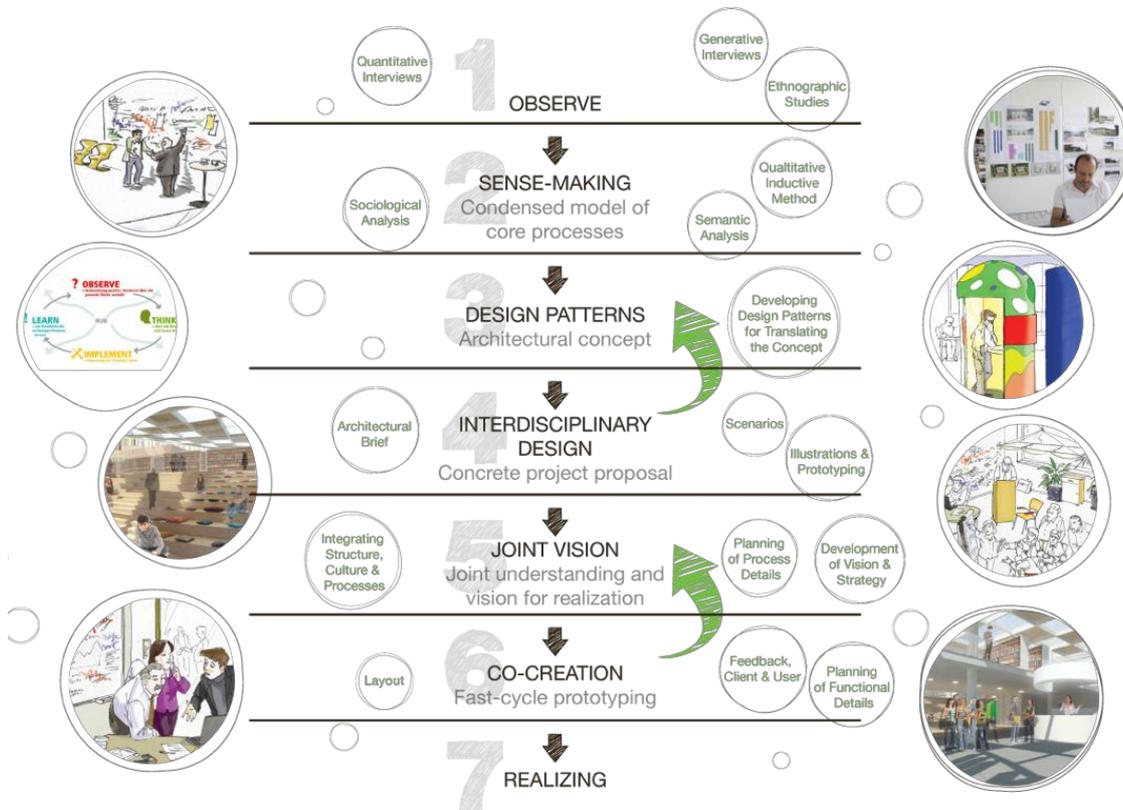


Fig. 1.: The Enabling Space design process

3.2 The Enabling Space design process

The project design of the “creative settlement” follows the Enabling Space design process/approach (see Figure 1): its goal is to devise and develop architectural design concepts for spaces cultivating and supporting processes of knowledge creation and innovation. The integration and orchestration of various space-dimensions having been mentioned above is one of the most challenging problems, yet powerful features of the Enabling Space approach. One has to follow a design process for achieving this integration. The design process being proposed in this section is the result of five years of the authors’ interdisciplinary research (in the fields of cognitive science, theory of innovation, epistemology, and innovation spaces) and of a large number of applied projects that have been realized in different industrial and cultural contexts (for examples see Peschl and Fundneider (2012, 2013) and <http://www.theLivingCore.com>).

This whole design process is based on a profound understanding of the social system under investigation and its systemic environment. Starting with an extensive research phase (“Observation”), the core knowledge and innovation processes of the social system as well as its cultural, organizational, and structural parameters are identified. This is achieved by applying a wide variety of participatory and ethnographic (qualitative and quantitative) observation methods. The experiences and perspectives of a wide variety of stakeholders are studied through qualitative, generative in-depth interviews. Furthermore, the behaviors and desires of potential users are identified by using a comprehensive quantitative online questionnaire. The observation/research phase is completed by ethnographic studies, as well as by observing and studying artifacts, processes, relationships, etc. that can be found in the organization or system.

In the next step, the “sense-making phase”, this systemic multi-perspective and multi-stakeholder view is transformed into a so-called “core-process model” illustrating the research findings in a highly condensed manner. In this phase, the observation results are analyzed, described and reflected by identifying patterns, (hidden) assumptions, polarities, discrepancies, and potentials in a complex qualitative inductive process so

that a coherent overall profile being based on a profound understanding of the social system can be developed. In this highly challenging inductive process it is necessary to work on big tables and literally/physically move items around, (re-)group and relate them (many methods that are relevant here are part of the design thinking approach [e.g., Brown 2008, 2009;]). These core processes represent the essence of the social system and act as a solid theoretical and conceptual foundation for all subsequent design as well as for decision-making processes.

This abstract model is then transformed into design patterns (Alexander et al. 1977) describing and explicating design qualities: Their aim is to provide the foundation for translating and transforming these abstract core knowledge processes into concepts for concrete (materialized) structures, activities and processes. They are a necessary prerequisite for understanding and realizing the various (architectural, technological, organizational, etc.) dimensions of the Enabling Space. On the basis of these design patterns, a holistic urban design concept is developed in transdisciplinary workshops bringing together experts from different fields, such as architecture, urban design, information and communication technology, landscape planning, etc. The resulting design concept goes far beyond architectural aspects and—in many cases—brings about changes in the social structures, processes, and culture. Architecture transforms social systems and vice versa.

Whenever crucial decisions are to be taken in this process, the client and a steering team are involved in the transparent planning of further steps, thus assuring continuous feedback between decision-makers, the teams of architects, researchers and experts, and possible users.

4 CREATIVE SETTLEMENT — RESEARCH PHASE AND OVERVIEW OVER INSIGHTS AND RESULTS

In the first phase (“Observe”), more than 30 extensive qualitative interviews (generative/appreciative interviews; e.g. Cooperrider, Sorensen, Whitney et al., 2000; Scharmer 2007) with a wide spectrum of relevant stakeholders (entrepreneurs, digital natives, investors, business angels, property developers, etc.) were conducted. An interview lasted for about two hours and aimed at establishing deeper insights into topics of the original client’s briefing (education, creativity/innovation, working, living) in order to develop a profound understanding of possible core processes for the “creative settlement“. Since this project aims at generating a radically new—at that point in time unknown—innovation eco-system, we could not speak with potential “users” as—at that stage—the project was not yet defined. Hence, most of the interviewees could not yet imagine what this settlement would be about; nevertheless, the interviews were conducted in such a way that we tried to listen to the hidden desires and needs of the stakeholders so that we could derive new perspectives from questioning and reflecting their assumptions (partly in a process of co-creation).

On top of these interviews, the authors visited the site several times and conducted ethnographical studies observing and investigating the context, urban setting, cultural issues, etc. (e.g. Kawulich 2005; Laurel 2003; Spradley 1979). Finally, extensive desktop research was carried out: on the Russian context, relevant Russian value systems/terms (e.g., personal power, family, stability, security, etc.), Russian culture and mentality, Russian economy, the political and demographic situation, on specific functions of the settlement (e.g., interactive science museums, alternative education/pedagogical approaches, learning spaces), etc. The interviews plus all of the remaining research has brought about a huge collection of data, information, first insights and ideas, as well as contradictory issues and polarity fields.

Phase 2 of the research process, the phase of “Sense-making”, tried to make sense out of these vast amounts of information from the field. This step aims at identifying patterns, finding implicit orders, achieving an understanding of background/hidden assumptions, etc. within this information in order to come up with the most important and essential processes or activities (“core processes”) defining the “creative settlement“. The result is a highly condensed model of the core processes depicted in Figure 2; it has turned out that children surrounded by family, living and education, as well as an enabling, inspiring, and vibrant working environment were the key processes for this settlement.

Up to this point, one could follow several well known scenarios that address these core processes quite well, for instance, in the form of a special business park, satellite town, or a science city (having some tradition in Russia); however, these solutions are not really innovative and—furthermore—were not in line with the expectations of the client.

5 GUIDING PRINCIPLES AND DESIGN PATTERNS FOR A SUSTAINABLE INNOVATIVE CREATIVE SETTLEMENT

Instead of falling back into or just adapting already existing solutions of urban settlements or business parks the design team developed distinct guiding principles/design patterns that are applied throughout this project. These guiding principles have been developed from so-called “polarities” (apparently contradicting issues that are excellent starting points for new ideas), from the design patterns, from insights from the research phase; they emerged out of the above-mentioned inductive processes and out of rigorously questioning and reflecting on the assumptions that stand behind the interviewees’ statements:

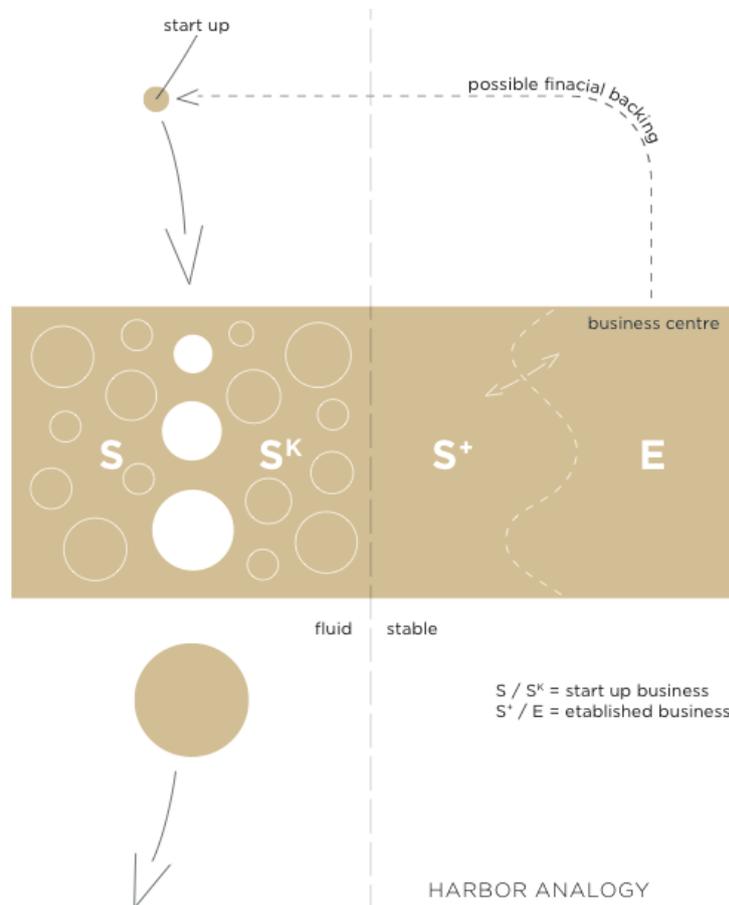


Fig. 2: The Harbour-Analogy illustrating the steady in-, through-, and outflow of new knowledge and people. Start-up businesses (S and SK) dynamically move through the creative settlement in order to bring in fresh and new perspectives. The established business people (S+ and E) are cultivating the stable pole.

(a) Role of creativity, innovation, and entrepreneurship: creativity and innovation are at the core of the creative settlement; they are embedded into entrepreneurial dynamics creating buzz and aiming for a thriving social, knowledge-, and innovation-dynamics.

(b) Openness: is present on various levels and in several domains: knowledge, open-minded people, socially open, open to the public vs. security issues

(c) Balancing the in-, through, and out-flow of new knowledge and people: start-up companies and a so-called established user group (people in strategic positions of bigger companies) are settling and working together in a mutually synergetic cooperation. Figure 2 illustrates the process of renewal (e.g., start-up companies have to leave the creative settlement, once a certain size and economical stability is reached and new start-ups move in).

(d) We are following here a well-known principle from biology, cybernetics, cognitive science, and systems science, namely the principle of autopoiesis: This concept was originally developed by the biologists H.Maturana and F.Varela (1975) for describing the dynamics of living systems: according to the concept of autopoiesis living systems have to be understood as self-sustaining and self-regulating systems, (re-)creating themselves and their borders in a continuous process of transient stabilities (a homeostatic equilibrium) by interacting with, reacting to, and actively acting on their environment. We are applying this principle here to

describe the knowledge dynamics and the social dynamics of the “creative settlement”. The goal is to maintain this tension, this “stable instability”, this state of homeostasis of inflow of new knowledge and people, assimilating this knowledge, developing it further, getting inspired, creating new knowledge, using and exploiting this new knowledge and, by that, creating new realities, innovations, as well as social structures. The whole system aims at producing a thriving ecosystem of new knowledge, creativity, prospering individuals and a stable social dynamics in accordance with the surrounding environment.

(e) Primacy of incubation: the creative settlement offers protection and at the same time it stays open for new ideas, knowledge, innovations, technologies, etc. (compare also the issue of exploration vs. exploitation (on the scale of a small-sized urban knowledge ecology (e.g., Corso et al. 2009)).

(f) Providing leading-edge education: from crèche to academia, education is organically embedded within living and working; furthermore, these educational places are open for people living outside the “creative settlement“, such as from surrounding cities and existing villages.

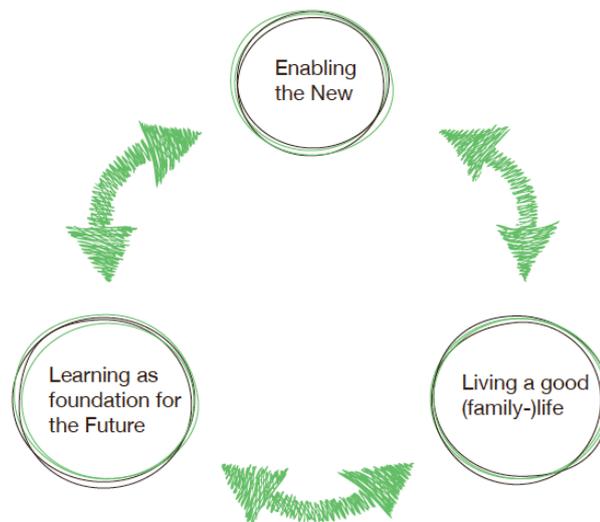


Fig. 3: The core-processes of the creative settlement.

Above these guiding principles various issues had to be solved and integrated in an interdisciplinary manner in the form of an overall process design. Figure 3 shows these core processes that are interacting and mutually causing each other:

- (i) “Enabling the New”: innovation, spirit of entrepreneurship, start-up dynamics
- (ii) “Learning as a foundation for the Future”: highest quality and leading edge education on all levels ((pre-)kindergarten, school, entrepreneurial academy, science museum)
- (iii) “Living a good (family-)life”: good balance between life, family, and work; high quality living environment; providing a safe harbor for living.

All these considerations led to the identification of the user-groups by relating the desired knowledge and innovation processes to potential users, their skills, their business contexts, as well as their needs for living (e.g., family live, good quality houses, education). Examples for such user groups are the start-up founders, people working at the start-ups, established business men (investing in the start-ups), young families living in this creative buzz, etc.

Furthermore, scenarios have been developed that offer quantitative measures concerning balancing of number of users per user groups and balancing the different functions (school, smart working, different residential areas, sport facilities, entertainment, science museum etc.).

6 REALIZATION OF THE CREATIVE SETTLEMENT

Departing from the above-developed guiding principles and design patterns the architects as well as the social designers started to transform these rather abstract concepts into concrete architectural and social forms (see also Figures 4 and 5); here are the most important realizations:

(a) Communication plaza: this element is a meeting & communication space around a central plaza for residents, business people, as well as the general public. A gradient from public (entrance, restaurants, science museum, etc.) to private areas (living, school, etc.) allows for different levels of privacy and openness. Inside, the plaza reveals the functions of the adjacent elements by opening up the architectural skin, thus becoming public experiences. The communication plaza is defined by the surrounding elements/functions, such as smart working spaces, a science park, an entertainment center, sport facilities, and a school. Thus, the communication plaza acts as a connecting interface, creating a buzz and a vibrant atmosphere just by being there at the intersection of these units and functions.

(b) Open and public educational spaces: open to the public and offering courses, activities, events, etc. on a regular basis. The concept is to provide a high quality educational offer, which goes far beyond classical school offerings or curricula. The authors suggest to view these educational infrastructures in a plug-and-play manner: i.e., to combine a set of the following modules according to the affordances, needs, preferences, etc. of the specific context and the environment of the “creative settlement”: (i) science and technology: newest insights and results from various fields of the natural sciences and technology are presented and collectively experienced, explored, and further developed. The goal is to involve the visitors in the process of doing science and research. One can think also of a science park of jointly creating new knowledge and insights in various settings (workshops, labs, fab-labs, simulations, etc.); (ii) arts and humanities: these modules comprise a wide variety of offerings as well as zones for different fields of arts: painting, sculpture, performing arts, dance, etc. There will be need of specific spaces for these fields of art (ateliers, stages, etc.); (iii) entrepreneurial thinking and innovation: provides state-of-the-art approaches in different fields of entrepreneurship and innovation. Both theoretical and practical aspects will be taught. The work being done in these courses and workshops might result in innovations, prototypes, and or co-operations with start-ups in the creative settlement (e.g., internships, etc.); (iv) thinking styles, interdisciplinary thinking, reflection, and personality development: Teaching in this module provides generic skills that are necessary for any kind of knowledge and innovation work and education. This is a unique offer, as these things are normally not taken care of in classical educational systems and curricula.

(c) Focus on balancing user groups and functionalities: in order to establish a fruitful symbiosis (entrepreneurial activities) between the various target groups it is important to keep the ratio of start-up people and established people (individuals in strategic positions of larger companies) well-balanced. Either group dominating would result in a shift of the character of the proposed “creative settlement”—especially a shift towards losing the creative buzz. Consequently, the design of the “creative settlement” is focusing on the links and relationships between functions, rather than on single functions. Hence, it is not possible to just remove or add certain elements or functionalities of the “creative settlement”, as this could imply a destructive perturbation of the autopoietic dynamics of the creative settlement.

7 CONCLUDING REMARKS

It is important to understand that this settlement does not primarily address a romantic view of living and working in the countryside or a kind of “wellness” program for a good work-live balance. Rather, by focussing on the core processes—in this case, knowledge and innovation processes—it is a well-balanced eco-system continuously bringing forth new knowledge, innovations, as well as educated and cultivated individuals and social structures. One has to know that there exists a long tradition of research settlements or science cities in Russia, e.g. Naukograd or Zelenograd—they have a rather positive reputation.

From this perspective, the “creative settlement” is located in a positive distance (accessible but remote) from a major city, this supports the above discussed creative processes and innovation dynamics in a highly efficient manner. Historically, cities emerged around (road) junctions, water routes, etc., since most products and processes were—and still are—based on material structures. In our age, this material foundation of products gets relativized: knowledge processes and knowledge creation are inherently immaterial, they are not bound to roads, but require new epistemological, social, as well as technological eco-systems in which they can thrive: Enabling Spaces.

This leads to a second important issue: the “creative settlement” is both open and closed: closed, because (radically) new knowledge is highly fragile and needs some kind of a “safe” container, where this knowledge can be incubated, explored, tested, etc. On the other hand, there has to be a steady stream of new people, knowledge, technology, etc. moving in and out in order to enable the creative settlement to regenerate itself,

re-create itself, re-define its borders, etc. (compare the analogy with an autopoietic system). In an analogy the settlement can be thought of as a harbor (see also Figure 2). Ships of young (start-up) entrepreneurs are entering the harbor (inflow of new knowledge, ideas, etc.) and after a period of protection (regarding their fragile ideas), incubation, and exchange (with other entrepreneurs and experienced business people) and when their business models have proven successful or at least promising, they are ready to leave the protected place and sail out across the ocean (entering the business environment). In this sense, the harbor (respectively, the “creative settlement”) is a place to anchor, a place for incubation (protection). However, it is of utmost importance that the ships are not becoming permanent residents of the harbor, since then the flows from the external world will be inhibited.

The project team has translated the concept into concrete architecture and process structures; that process has been finished by the end of June 2012. First visualizations are shown in Figure 4 and can be found under <http://www.thelivingcore.com/realized-projects/> and <http://sferiqtown.com/>. Negotiations with potential investors and political stakeholders in Russia are underway.



Fig. 4: Overview over the creative settlement.

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