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Common Properties of Innovation Spaces: Design Thinking and Beyond

Parallel Session 1
"Future-proofing our space"

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Abstract

Designers, R&D personnel, decision makers are the crucial ingredients for Science and Technology Parks (STP). They have to be stimulated and supported by their environments. However, designers as well as business decision makers are also under continuous pressure for productization and money-making. Innovation spaces have therefore evolved with the businesses, their working habits, and technological advances that support creation, collaboration, and corporate priorities. Innovation spaces help STP residents in their high-speed, creative endeavors (e.g. rapid ideation and prototyping).

Innovation spaces are needed for any human activity that promotes creativity. Architecture, interior design, computer graphics are powerful instruments in constructing futuristic innovation spaces [1]. Whether physical or virtual, these spaces are in fact "micro" Areas of Innovation (AoI) buried within Science Parks. By careful analysis of these emerging spaces we hope to extract some common properties and even find potential "self-similarity" rules among micro AoI, Incubation centers, STPs, and the regional "macro" AoI in our full paper. Self-similarity emerges in nature as well as in distributed, technological human activities such as the Internet formation [2].

An innovation space as a work habitat combines efficiency and flexibility with aesthetics, supports multi-functional use within the available area, and enables communication between dynamically formed teams/groups. STPs are built on the core idea of being useful as collaborative environments; so they exactly need to become the innovation spaces for their end users.

In this paper, we investigate current and emerging innovation spaces and find common properties that drive innovators and engineers to be productive. As good practices, we give examples from several Teknopark Istanbul's resident offices of various sizes and from different technology disciplines. These offices were designed with different functionality in mind, but at the end showed common properties that we attribute to "desire for innovation".

Design Thinking Process

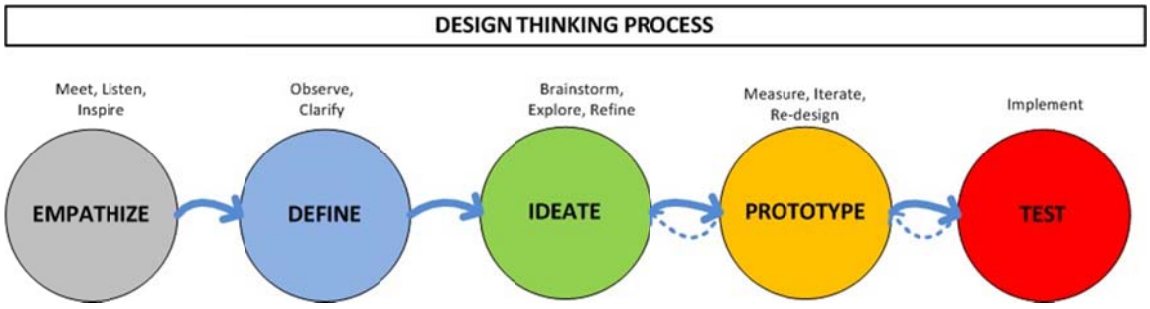

Figure 1. Design thinking process.

Peter Rowe was among the first to coin this term in his 1987 “Design Thinking” book [3], but many people have contributed to the definition of this process over the past 30 years [4,5]. Figure 1, summarizes the crucial elements in the design thinking process. Design thinking is a cognitive process that initially tells designers or engineers to empathize with the people (or businesses) that have a specific problem before trying to solve these problems. In this phase, problem owners are observed, data is gathered and the challenges are identified as much as possible. Next, the user reqirements are defined and creative solutions are ideated through brainstorming activities. Forming brainstorming teams [6] from multi-disciplinary backgrounds can help increase the spectrum of ideas generated here. This stage fundamentally requires “divergent thinking”, so that many possible solutions are explored. Next, the ideas are turned into prototypes and tested in real or simulated environments. In these phases “convergent thinking” process applies since there are realities about what users’ top priorities are and what kind of budgets are available for these projects. Several solutions may be refined, re-designed, tested and eliminated until the iteration stops and people converge over a solution. We can also summarize the design thinking process into 3 steps of Inspiration, Ideation, and Implementation.

In our full paper, we will give examples from Teknopark Istanbul’s own innovation spaces such as the IdeaCube Incubation Center and spaces of other companies. We will compare and contrast findings with prior studies [4,5,6,7] and publications in this area. Next, we exemplify some of these innovation spaces.

SAP Development Center Turkey @ Teknopark Istanbul

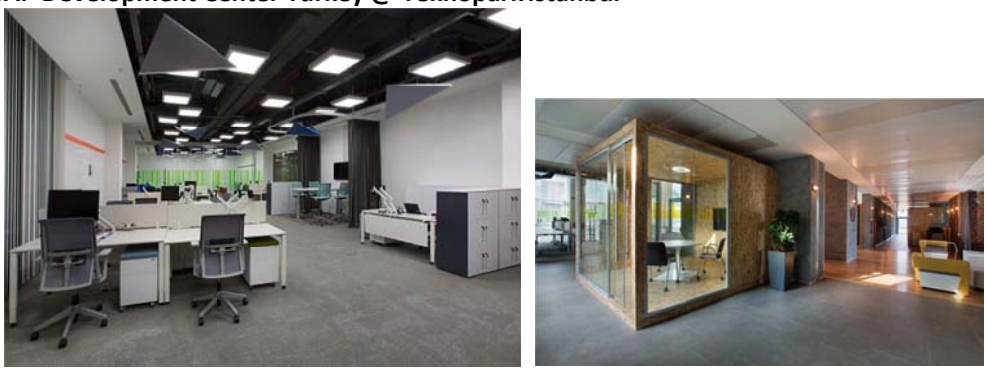

Figure 2. SAP Development Center offices use design thinking philosophy in their interior design.

The center is located in an entire upper floor of the Teknopark Istanbul R&D Blocks. “Design thinking” was the main philosophy behind its interior design. With high and open ceilings painted in black that do not hide any of the mechanical piping or ventilation units (i.e. an incomplete garage atmosphere), the space aims to motivate its engineers for completion and co-creation. All of the furniture in this office have wheels to encourage dynamic teaming and mobility. The office spaces are also flexible to allow re-shaping during daily use. With acoustic curtains certain areas can be quickly turned into meeting or educational rooms. If anyone wants complete isolation from others to focus, he/she can reserve (or grab) one of the silent rooms that resemble wooden crates.

GE Turkey Innovation Center: Education, Teaming, Rapid Prototyping

GE Innovation center was designed as a mixed-use space, which invites visitors to shape it. The center includes a health & life sciences laboratory, workshop areas, library and data centers.

Figure 3. GE Innovation Center.

Radarsan Radar Technologies Inc.: Creation inspired by Nature

In Teknopark Istanbul, we witnessed that it is not only the global corporations such as SAP and GE that have a vision for design thinking, but also the local SMEs such as Radarsan that have vision for globalization. Its primary focus is on research, development, design and manufacturing of Radar systems enhanced with sensor fusion. Its 164m2 office reflects all its needs for rapid prototyping and growth. While in the middle of Radarsan office we see a large table for teaming and co-working, we find prototyping disciplines on each corner of the office: 3D printers for mechanical prototyping (casing), an electronic atelier for experimenting, and a complete SMD (Surface Mount Device) electronic production line. Another SME company at Teknopark Istanbul, named ElectraIC, also adds a “mini data center” as one of its creative corners.

Figure 4. Radar Technologies Inc. office and production spaces.

Virtual Innovation Spaces: Google Tilt-Brush ™ Project

Google has a new Virtual Reality (VR) program that currently works with HTC Vive headset and controller. As described on this web site (ref): "Google Tilt Brush (TM) project lets you paint in a 3D space with virtual reality. Your room is your canvas. Your palette is your imagination." Again we see that a need for quick transfer between inspiration, ideation and implementation is met with this product.

Figure 5. Google Tilt Brush ™ VR environment.

IdeaCube Incubation Center @ Teknopark Istanbul

In IdeaCube we provide shared office spaces, technical equipment and support services, a bio-chemical laboratory, a pilot production atelier, dedicated staff, mentorship, global market access & acceleration services, business match-making opportunities, and easy to Vecture Capitalists (VC) to our incubatees. In full paper, we will elaborate on the design thinking characteristics of this space and additional spaces and services to be provided in the future.

Initial Learnings

- *Colocation: Be physically close to people and resources not to lose creative focus. No time is lost in between the ideation and prototyping.*
- *Sharing vs. Privacy: Spaces are shared, but with a concern about privacy. Novelty is jealous by nature (INNOVATION has to be the novel, newest and not the repeated- seen before).*
- *Dynamic Organization / Corporation: Privacy and security of the innovation space is sometimes requested by an external Partnering organization (e.g. Government, etc.). The space has to get*

a security clearance. These organizations can set the rules for who is working with who and who has access to what. Employees working for these projects, become a part of this external organizational during the project and play with their rules. Innovation spaces have to support these dynamic organizational boundaries.

- *Virtual vs. Physical: Innovation spaces can be physical or virtual. The virtual spaces can be completely digital or mixed with reality in the forms of virtual reality (VR) or Augmented Reality (AR), sometimes called the Cyber-Physical Spaces. We are currently working on a VIRTUAL*

Teknopark Istanbul campus model to be used for planning, business development, and other extended services.

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