Setting-up a Design Factory within a Creative Science Park @Aveiro Region

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Abstract: This paper aims to describe the ongoing implementation process of the Design Factory Aveiro (DFA) integrated in the Creative Science Park Aveiro Region in Aveiro, Portugal. The DFA is a place for the convergence of diverse subjects and entities to foster innovative and creative projects, acting as an interface that translates the efforts of academia to meet the needs and constraints of the existing socioeconomic, industrial and cultural local reality. The main goal is that, by crossing an experimental platform which promotes research through cultural mediation, based on co-creation and collaboration, will instigate the generation of innovative products and services that might have immediate applicability in the market. Above all, the innovative methodologies that will arise from this interaction, will create a place for radical and disruptive innovation.

Keywords: Design Factory, Collaboration, Multidisciplinary, Setting-up.

1. Introduction

This project started in 2009 as part of a submission for public funding by the University of ... to build a Creative Science Park to catalyse local innovation and entrepreneurship. Although the initial submission did not consider a design team in its program, it was considered after analyzing similar success projects, including the Aalto Design Factory and the Design London RCA Program, that lead to the development of a Design Factory concept which was considered essential and core for its successes. Even so, it was always considered of minor importance in the overall project when compared with other areas like engineering or management.

As the project evolved, Design has become a key vector as the different players recognized its values and specificities. It gradually changed its role, from a subject with minor importance to one that can drive and/or lead projects, in a step-by-step methodology that can be replicated and applied in similar circumstances. This paper will describe the main actions of this process:

- The creation of an inspiring workplace - It’s important to have a workplace that promotes creative collaboration with partners and helps deal with bureaucratic procedures.
• The process of assembling a great team – the intertwining between technical skills and social relations is the base for a good team, and to ensure motivation and that common goals are achieved, a well-coordinated team is essential.
• Maintaining focus – as the project evolves the number of tasks grows exponentially and time fades, identifying and planning all the tasks is extremely important.
• Learning from others – by visiting similar places it is possible to identify methodologies and models and learn from their experience and mistakes.
• Works in progress – small-steps’ approach was adopted in the actions taken to set-up the DFA.

Setting-up and running the DFA could be an opportunity for strengthening the role of design among industry, institutions and the society in general. Having room for experimentation will lead to a more innovative and disruptive approach to problem-solving; and the interactions and dynamics between different agents can change positively the way the DFA will deal with its challenges in the near future. These are vital aspects to the success of this project and so is the empiric knowledge acquired in the process that are in the core of this paper.

Although the intent from the beginning was to develop innovative projects in an inter and multidisciplinary environment, a place for knowledge transference and where academia could do applied research in collaboration with other stakeholders, the initial submission neglected to include a full time design team and to acknowledge the key role of design in innovative processes — as the Design Council in 2011 put it “Good design is essential to good business”, a critical tool to turn ideas into products and services; they reinforce the idea arguing that Design is the way to connect creativity with innovation” (Design Council, 2011:4).

By visiting and analysing projects with similar intents like the Aalto Design Factory and the Design London RCA Program, and understanding the key role of design in leading and driving innovative projects, a design-team was considered essential and core for its success, thus the inclusion of the project — Design Factory Aveiro (DFA), as part of the core organization of the Creative Science Park Aveiro Region. In this project, the design team have a strategic role in defining, assembling and managing the DFA.

The DFA is an interaction between people, spaces and equipment that aims to stimulate and materialize collaborative practices that will result in projects that generate innovative products and services for the social, cultural and economic sectors. The DFA intends to offer an environment where radical innovation can be fostered into tangible products and services, and where existing products and services are object of constant incremental innovation (Norman and Verganti, 2014). Here design, not only has the role of leading and driving innovative projects, it acts as a cultural mediator and is focused on the promotion, evaluation and dissemination of activities that catalyse the interaction between people with different backgrounds (students, researchers, entrepreneurs, creators, specialized public and society in general).

The region of Aveiro has a fortunate geographic location, with good road access, railway and port infrastructures that can give the logistical support for a strong intermodal platform that promotes trade and communication among national and international partners. The physical and strategic proximity between the University of Aveiro and the local municipalities can, if supported by design tools, help promote the collaboration between the academia and the economic, social and cultural agents in the pursuit of common goals.

For the DFA to accomplish all intended activities, a constant flow of creative human resources has to be guaranteed, therefore it was established that the executive management of the DFA had to be
someone with a strong link to the University of Aveiro and that was a senior member of its Design Scientific area, active in all of its educational cycles (undergrad, postgrad and doctoral program). At the same time it should be a person with knowledge of the socioeconomic and cultural local reality and experience in professional projects. This will ensure that all projects will be design-led or design-driven, supervised by someone with a holistic view and able to assign a multidisciplinary team that holds a designer as an active member, and that scientific and academic knowledge is guided towards tangible outcomes that can be materialized and applied to the development of innovative products and services.

2. The process so far....

2.1 Adapting the existing architectural project to Design needs

The DFA was considered in the architectural project of the CSP main building that didn’t consider its specificities. When the DFA team was nominated by the Board of Directors (Rector of University of Aveiro among others), significant changes in the physical space were identified, as well as in the organizational hierarchical structure and changes had to be made in order to adapt the existing building and project to the envisioned. Adaptations had to be made in view of its goals under a tight budget and already existing logistic constraints, on one side it should fit and not contradict the CSP masterplan, on the other it needed an independent set of rules and procedures that will allow its correct function with enough elasticity to adapt to future unperceived demands.

Some of the main clashes that the DFA brought to the original masterplan of the CSP were: bringing creativity as a third vector to boost the competitiveness of the region, when only innovation and knowledge were seen as key aspects; the idea that in order for there to be collaboration, getting the different actors into close contact is not enough, activities and the physical environment have to be designed to guarantee clear communication and provoke interaction that will lead to actions of productive collaboration; and that if innovation is the goal, human and technical resources have to promote platforms that support inventors and tinkerers in their activities in the pursuit of radical innovation, and that design needs observation, ideation and testing to guarantee incremental innovation (Norman and Verganti, 2014).

2.2 The creation of an inspiring workplace

The Design Factory Aveiro promotes and facilitates collaboration, interaction and networking among a wide public (students, researchers, entrepreneurs, creative minds, focussed groups and the society in general). Its aim is to assist with an empowering environment and with creative methodologies in the conception and development of innovative products and services guided by design (design-led and design-driven).

The DFA will be a dynamic platform that facilitates the exploration of design research tools in all three vectors: research through Design, for Design and by Design (Frayling, 1993); design processes and methodological practices, as a hub committed to innovative projects that are led and/or driven by design, where the interdisciplinary and multidisciplinary research and hands-on experimentation practices are the basis to the materialization of concepts into products and services.

Consequently, the space needs not only its own identity, it needs to guarantee a dynamic set of infrastructures that are able to adjust to each team’s needs and specifications; to manage various and multidisciplinary teams at the same time; to deal simultaneously with many projects that have
different work schedules; to define and manage public and private areas; and above all to assure that the hands-on multidisciplinary, design-led methodologies have a constant visible presence at all times. Thus the existing infrastructures were revised in order to accommodate spaces with different purposes (creative work, meetings, hands-on workspaces, exhibit areas, spaces focused on capacitation and communication and spaces that enforce interaction – figure 1), spaces have to be defined according to the expected workflows and be able to adapt to new ones, have visual communication between each other and sensorial continuity — although spread between two levels of a multipurpose building, all DFA spaces should have a common aesthetic language to be easily identified as being connected.

Figure 1. DFA Spaces

Inscribing the existing architectural project with a set of characteristics that would allow to fulfil specific needs and bringing it closer to what was envisioned as the workspace of the near future. People should not be immobilized at a specific workstation, they should have the freedom to work anywhere; and collaboration should be promoted by creating “non-work” environments where one can enjoy a meal and relax or even do outdoor activities1. Thus, changes were made to the initial architectural project that would guarantee the intended usability: optimized and dynamic circulation

http://www.businessnewsdaily.com/6232-future-workplace-trends.html
of people and materials; visual communication between spaces; easy maintenance; illumination was optimized according to space/activity; specificities required by the equipment; and common aesthetic language (Figure 2).

The final layout DFA spreads throughout 2 levels. In the ground level we have: store; service prototyping lab; heavy material prototyping workshop; ceramic workshop; electronic workshop; cafeteria/restaurant; main exhibit area and gardens. In the first level the program continues with: co-working space; design studio; 3D and graphic workshop; various offices; relax-room; multifunctional space and continuity of the exhibit area.

The location of the building by itself is a promotor of a less traditional workspace, positioned in the marshy outskirts of Aveiro, has in its bucolic waterfront an impressive uniqueness (Figure 3). Because of its 6 km distance by road to the University of Aveiro, the need for a new straight line (pedestrian and bike lane) was developed, electrical bicycles will ensure a good stroll to work and a “slow” attitude that gives time for contemplation of wildlife and some minutes of fresh air before and after work. It is also located very close to main highways and public transportation connecting it to the University and making it easily accessible.
2.3 The process of assembling a great team

In order to ensure the progress of the DFA activities, a constant and renewed flow of creative human resources is crucial. A tight connection with the University is vital to ensure the team elements that are needed to develop ongoing projects, and a constant inflow of scientific and academic knowledge that will provide elements for applied research in the pursuit of innovative products and services. The main source of human resources for this project will be students (undergrads and postgrads) and researchers from the Design field, therefore the board of directors assigned the coordination of the DFA to a senior staff member of the Design Scientific Area. This general manager (GM) must have an outstanding academic and professional background that will enable and will act as a liaison agent between the University and the DFA (Figure 4).
It was established that the management of the DFA should have scientific and technical autonomy and should be subdivided into 3 organic units: Strategy, Process and Communication (Figure 5). For each organic unit a supervisor with specific technical and social skills was assigned by the GM. Independent of their individual curriculum, creating a united team that intertwines technical skills with social relations was the base of choice of each team element by the GM. The GM has to ensure that each chosen element would be able to coordinate following a general plan but with independence to adapt and propose change, i.e. have the experience in organizational structures to keep common goals and at the same time have the maturity to follow their own subjectivity based on their professional experience.
The main responsibilities of the Strategy Unit are: the implementation and operationalization of the strategies of action; to establish and follow-up institutional contacts from the scientific and technological System; for the get-together of research projects; and for the establishment of multidisciplinary teams and identification of elements for future teams. This led the GM to invite for the supervision of this Unit a person with knowledge of the administrative function and structure of the academia, and with a big network of contacts within local institutions.

The Process Unit assumes responsibilities of how things will be materialized: Identification and implementation of the appropriate methodologies for each project; managing spaces, equipment and people assigned to active projects; and for the communication between the DFA and the social and cultural and economic partners. For the supervision of this Unit the choice landed on a senior designer with experience as project leader with the local communities.

The need for a Communication Unit was evident not only for the DFA to disseminate its ideas but for communication mediation between the different players: overseeing project workflow from start to the end; for internal communication between DFA, CSPA and Users; and communication with the social, cultural and economic tissue. Someone with a background in information visualization and with experience in scientific communication was called to oversee this Unit.

2.4 Maintaining focus

Keeping focus on goals and the milestones necessary to achieve them is not as straightforward as it may seem. Due to the uniqueness of the DFA project the core-plan is not a closed one, on the contrary, it has a dynamic, flexible and adjustable nature.

The DFA intends to offer conditions for the creation, development and materialization of innovative products and services with added value, providing design-led services and methodologies. A space where paradigm shifts happen in the business, scientific and technological systems, fostering a behavioural change, generating new and more interdisciplinary ways of working with the intent of developing products, services and concepts of excellence. — Thus the need to have an independent non-hierarchical management with autonomy to adapt efficiently instead of being dependent of a slow complex chain of command. It’s more about adapting and generating tools to adapt fast and adequately than about being very well prepared for a specific activity; not only spaces and equipment’s need to be adjustable, people also must be flexible.

As the project evolves in time and in detail the number of tasks grows exponentially and time fades, identifying and planning all the tasks is essential in the direction of not losing track of the main focus. In order not to lose track of the main goals and milestones while dealing with minor popup or last-minute tasks, a very clear list of intents was defined by the team members and approved by the main shareholders (University of Aveiro and municipalities) and the CSP’s administration. Although every intervenent recognizes that the plan presented is a guideline to achieve certain ends more than a strict set of orderly step-by-step phases, each shareholder had their personal interpretation of how to bend this flexibility in different directions, this led the DFA team to define bylaws and an operating agreement that would bind all to a common written document. This document described the intentions more than the functioning:
Objectives:

- Establish a network of research projects and partners for their development under the orientation of DFA, in which design is a value multiplier and strategic differentiating factor;
- Stimulate the creation and development of innovative and value-added products and services, based on design methodologies (design-led and design-driven);
- Promote and facilitate applied interdisciplinary and multidisciplinary research, provoking and facilitating collaboration, interaction and networking between the various partners;
- Demonstrate the operative potential and the advantages that derive from these methodological practices, tools and participatory design processes developed at the DFA, for the strengthening of a collaborative, creative, innovative and stable relationships;
- Foster innovation through design and collaboration between the economic, sociocultural fabric and the scientific and technological system;
- Advise and facilitate the materialization of projects, that outcome from strategic partnerships between the economic, social and cultural fabric, and the academia;
- Be an interface to gain access to technical, scientific, cultural, social and artistic knowledge, in a process managed, catalysed and promoted by Design;
- Foster and leverage technical, technological and human skills in an informal environment fertile to creative process as an extension to university education given at the University of Aveiro, and among other institutions of the scientific and technological system;
- Harbour and empower the academic and scientific knowledge of the students and researchers in the pursuit of the development of innovative products and services.

2.5 Learning from others

The DFA team looked for similar structures in order to learn from their experiences, and if possible, improve the existing practices.

Being the Design Factory model a relatively recent approach, it is natural that the initiatives that have adopted it are still scarce, being in most cases in embryonic and exploratory states regarding the practices to be instituted. In this context, the Design Factory Global Network (DFGN), an initiative of the Aalto Design Factory, has been trying to establish the basis for a global and shared functioning model with the aim of obtaining "Shared understanding and common ways of Working (to) enable Design Factories in the network to collaborate efficiently across cultures, time zones and organizational boundaries fostering radical innovations".2

The GM has visited some Design Factories, and it has decided that the other team members should also visit and talk with the GM’s of the visited places. When this decision was made it was given a special attention to the possibility of being a member of the network, however, not excluding entities that operate outside the DFGN. A broader research allowed us to compare the different methodologies and operating models and, it was in this perspective that we selected the Aalto Design Factory (Finland), Porto Design Factory (Portugal), Aalto-Tongji Design Factory (China) — all belonging to DFGN — and Polifactory, (Milan, Italy) — as an example outside the DFGN.

2 http://dfgn.org/
The main conclusions showed us that, regarding the organization of the spaces, we verified that across all the examples, all of them clearly integrated three different types of infrastructures:

1) Creative Spaces (studios, workshops, common work rooms, ...);
2) Leisure and Social Spaces (gaming rooms, shared kitchen, outdoor spaces, ...), and;
3) exhibition spaces (from small meeting rooms with video conference to large exhibition areas open to the public).

Concerning the workflow, we also observed that the adopted methodologies of all the members of the DFGN were very similar, which was expected due is common nature, but all three of them developed some specific answers considering is local realities. Working outside the DFGN, the Polifactory emerged as more versatile structure, more adaptable to specific needs and, in that sense, less established with all the costs and benefits associated.

2.5. Works in progress

A set of 5 actions were set out to prepare and sustain the launch of the DFA and its activities, ideally these actions will allow the team to achieve a level of best practices and prevent future fails. Specific actions were designed with the intent to reduce the stress of launching and promoting the DFA. The idea behind this “soft-opening”, is that by executing actions that are similar to the DFA activities but smaller in complexity and scale, that this will allow to visualize and anticipate practices that need improving — the adjustment of spaces and equipment; the optimization of processes and human resources; the testing and validation of functional aspects; the promotion and credibility giving to the DFA brand/identity. These actions aim to look and correct fails in a fast and cheap manner and test ideas that have uncertain results.

The 5 actions are:

1° - Development of the Design Factory operational model; 2° - Diagnosis, survey and project identification; 3° - Project qualification; 4° - Enlistment and promotion of projects that have a design-Led approach; 5° - DFA Prototyping Lab; have the purpose to allow a unruffled adaptation of the team to the new building and equipment, and to identify aspects that need to be adapted or rethought to better answer the future needs. These ongoing and in continuously refining actions are sequential and interdependent, although the previous one doesn’t have to end for the next one to start, they have a chain where some millstones of the previous actions have to be set before the sequential action can initiate.

At this moment the 1° and 2° actions have started, in order to implement the 1°, the following tasks were defined:

- Identification and analysis of international and national success stories — grasping the model, looking for common features, understanding if it is possible to build on to the core concept, find means do adapt to the existing context;
- Development of the DFA operation model within the CSPA and its presentation in meetings for discussion and idea collecting to the community of internal and external partners (Business Associations, Municipalities, Scientific System ...).
- Structuring the team to follow up on this process (as described in point 2.3).
- Monitoring, evaluation and fine-tuning.

After all final adjustment of the model, the concluding ideas were drafted in the
format of a written document and presented in a public session, binding all to a common outline. Although this previous step is still an open one, by defining its outlines and the people involved, the 2nd action could commence, the activities planned for this action are the following:

- Previous University-Industry project identification to develop within DFA to start building the Design Factory ... brand — the apprising of previous University-Industry success partnerships that could be reactivated would guarantee an easier work environment do to personal relations and partners that would better tolerate any aspect that doesn’t go according to planned.
- Development of communication tools that support the DFA new brand (publications, exhibitions, television documentaries ...).
- Identification of R&D projects in the academic community, the business community and the public sector.
- Streamlining a digital platform to attract partners.

With the 2nd action ongoing we intend to continue the defined workflow, taking as priority for the next steps the organizing and categorizing the assembled data, and as soon as possible initiate hands-on activities.

3. Results & Conclusions

Results achieved so far are the specific design changes in the main building which will allow the implementation of the defined vision and mission. As a result of this ongoing process, the management and working model has been defined, based on an organizational structure without hierarchies.

Last but not the least, the team has made several contacts with the local industry, as one of the cornerstones of this project was to equip the space with Portuguese products. In this sense, the contacts and visits made to local companies has made possible the establishment of protocols for future research projects with multidisciplinary teams led by the Design Scientific Area.

There are some more results that will be shown during the conference.
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Teresa is a Designer with a degree in Interior and Furniture Design, a post-degree in Industrial Design, a Master’s in Industrial Design and a PhD in Industrial Design and Multimedia Communication. She has been lecturing at the University of Aveiro since 2001 and is also an invited lecturer at the PhD Design Program from Politecnico di Milano (Italy), at the Product Design Master at the Faculty of Fine-Arts (University of Porto – Portugal), and was a Visiting Professor in 2016 at Tongji University College of Design & Innovation (Shanghai – China) and in Koln International School of Design (Germany). Dividing her research and pedagogic practice interest between Service Design, Product Design and Design for Social Innovation, since 2011 she is in charge of the research group ID+ DESIS Lab and member of the International Coordination Committee of the DESIS Network. She have been the scientific coordinator of the curricular unit Design for Social Innovation offered in Design Master degree and Master in Product Design and Engineering degree in University of Aveiro. In 2010 she led the group that created a Master in Engineering and Product Design, a conjoint offer put together by the two scientific areas of Design and Mechanical Engineering. Over the course of the last 6 years she has diverse university management roles, namely Design’s degree direction and vice-direction of the PhD programme; within the Department’s Executive Board, pivot for the Cooperation with Society; and Department’s pivot next to UATEC (Unit of Technology and Knowledge Transfer) and UA’s coordination of the MEDes programme (Master of European Design). Presently she is coordinating three European projects in the areas of Product Design and Design for Social Innovation, involved in various networks of teaching and research across Europe, Central and South America and Southeast Asia. She has been appointed by UA rector to coordinate a team of Design professionals to implement the Design Factory Aveiro, within the complex of the Creative Science Park @Aveiro Region. The coordination of the Design Factory and the definition of its working model, activities, and equipment has been her primary task at the University of Aveiro since 2016.

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