Exercising Creativity 2011

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EDITORIAL

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Prologue

Taking the words of Diogo, one of the participants of the summer school, it is *mentally awesome* to look back at a great summer school on creativity engineering, which was held for the first time at the Vienna University of Technology from July 4th to July 22nd 2011, after one year of preparation.

I want to thank the people who made this event an intense and fruitful learning and working experience. My sincere thanks go to Mitar Pitzek from the International Office of the Vienna University of Technology who invited me to organize and conceptualize the summer school on creativity engineering. Without his commitment to this topic, there would simply be no summer school on creativity engineering. Thank you to Daniel Collado-Ruiz from the Universidad Politècnica de València and Jutta Jerlich from Nagoya City University who were co-organizing the syllabus and the contents from the very beginning. Thank you for all your efforts and your motivation.

And finally, there would be no summer school without the highly motivated participants from over 10 different countries: thank you Pedro, Jana, Mehraneh, Jorge, David, Philipp, Luka, Yanping, Mona, Zeynab, Yasaman, Anastasia, Olya, Tassos, Diogo and Yulia!

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Head of Creativity Engineering Summer School

Editorial

Following the motto of the summer school *from a creative idea to the successful marketing*, this book presents the work and findings of the participants to the Creativity Engineering Summer University. They were asked to develop an idea and stepwise substantiate it. Instead of an oral or written exam at the end of the school, participants had to work in groups for a particular idea of their choice, use the contents taught during the course to make the idea tangible, and come up with a concept that is almost ready for implementation.

The expectation of most participants about developing an idea may have been just generating an idea. But there is more about an idea than its birth phase. In one of our lectures it was pointed out that being named a pure *inventor* is actually not a compliment. A pure inventor has good ideas, and may come up with new products or services, but what would the idea be worth if it cannot be marketed, hence successfully realized?

Obviously, the aim of the summer school was to go beyond daydreaming, even though daydreaming may constitute a source for new or even creative ideas. Beyond daydreaming, the purpose was to find all efforts, strategical moves and activities that would make those dreams come true.

In order to follow the path from idea generation to idea realization, there is a need to understand several mechanisms that have an effect on this transition. The first set of mechanism is all those processes in a particular individual that influence creativity. These processes need to be analyzed on psychological level in order to understand where the source of ideas lies, how ideas can be developed and how to increase the potential of being creative. You can imagine that once a creative personality is trained, the performance of a creative individual will differ when put into a team. This will also be true if all team members have creative personalties. Teambuilding mechanisms and group dynamics effect the creative performance. Understanding such mechanisms is critical to ensure creativity.

Now, imagine a well attuned and creative team: put it into an organization and its performance regarding creativity may not be as good as in the team. Organizations

have to be innovative in order to survive. Innovation, according to our definition, includes all efforts and processes that can be marketed successfully. A creative idea in an organization is one that is innovative, hence can be marketed.

To cover all different aspects of creativity in the process of idea generation to idea realization, the course program was divided into three main parts:

1. Individual creativity
2. Creativity in teams and
3. Creativity in organizations

Human traits in creativity where discussed through the lectures for individual creativity. The role of intelligence, personality and cognition in creativity were explored. The relationship between idea generation mechanisms and the aforementioned human traits was studied.

The second part of the summer school included cultural awareness training and an introduction to business models. A big portion of of the course was dedicated to problem solving, which was explored from psychological point of view and from a project management point of view.

We were lucky to have two guest lecturers, the general secretary of the association *Mediation ohne Barrieren* who talked about conflict management in teams. The second guest lecturer was from the company *Palfinger*, who gave us insight how creative ideas are handled within the company and how innovations take place.

The third part of the course included idea generation in teams, idea analysis and an introduction to business plan development.

All throughout the course, a strong emphasis was put into group dynamics. If we were talking about creating a relaxed but motivated environment in creative teams, it would just not be coherent to neglect this fact. Every morning we had warm-up sessions to have people fully active. We had the students play some number games, or do some music or theater improvisation. The main reason behind this was to get people in an active and creative mood. If you start by a creative and motivating activity, discussions become much more fluid just afterwards!

We are happy to introduce in this book five great projects developed by the participants. All ideas were generated through the summer school and were further developed and prepared for being implemented.

Additionally, ideas were presented by each of the participants on the last day. Focus was given to the quality of the presentation and the engagement that the students have with the audience. For that reason, a workshop on how to prepare effective and motivating presentations was carried out, to avoid bulky text-intense

psychology-neglecting unplanned presentations. Basically, the motto was *thing think think* about everything involved: the content, the different channels, your movements, your tone of voice, your questions, or even your jokes.

PART I

Conceptual background

Chapter 1

Introduction

Collado-Ruiz, D. [1], Ostad-Ahmad-Ghorabi, H.[2]

Creativity attracts the attention of most disciplines. It has been a basic feed for artists, necessary for innovation, strategic for product or technology development, and a key factor in project or process management.

1.1 What is creativity?

But what is creativity when put in the spotlight? Most societies have long liberated it from its godly nature, but still project on it an aura of mysticism. Merrian Webster's Dictionary defines creativity as *having the power to create*, or *exerting the act of creation*. This fact of creating something new is probably one of the reasons for perceiving it in such an obscure way.

The last decades have seen creativity become the subject of rigorous scientific interest, after the work of J.P. Guilford. Even if this arena does not fall for a common definition, there are some strong points of agreement: *creativity involves the generation of ideas that are novel and appropriate.*

There is no discussion about the need for creative ideas to be original or new. If I need to illuminate the road in front of a car, using a lightbulb does not seem particularly creative. Maybe at Edison's time it could have been something unexpected, but nowadays we see this solution every day.

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Novelty of ideas can be assessed at different levels. Ideas that seem novel at hand can have been thought by others some time before. They are creative to us, because we do not know – in our field, or in our context – of their existence. Other ideas, however, are genuinely new and have never been explored. M.A. Boden distinguishes between what she defines as psychological and historical creativity, respectively (also called p-creativity and h-creativity).

However, an original idea does not necessarily mean a creative one. If we are trying to clean the living room by spilling acid all over it, it is a very original way of doing it, but not practical at all. If you ask somebody whether that is creative, they would just categorize it as crazy. For an idea to be creative, it must also be appropriate for the problem at hand.

Both definitions combine seamlessly when defining what a creative idea is, and people that have creative ideas are considered creative people. Some other literature adds the parameter *surprisingness*, out of a very interesting phenomenon: when seeing or having a creative idea, people tend to feel motivated and encouraged to continue exploring it. Not surprisingly A. Maslow pointed out creativity as representative of autorealization. However, since this is a *post-hoc* assessment rather than *ex-ante*, the only appropriateness and novelty will be used hereon.

The environment in which one operates is also relevant as to the creativity of the output, in different levels. M. Csikszentmihalyi points out that the performance of very creative individuals depends on three different factors: the person, the domain and the field. Being predisposed is one out of three. Being knowledgeable about the *domain* is also very important to avoid reinventing the wheel, to know where the answers might be, or to be able to ask the correct questions. Understanding how the *field* works is also important, to make sure ideas are successful beyond mere theory. It ensures appropriateness beyond novelty. It contributes to the materialization of the idea.

1.2 How are we creative?

Beyond measurement, research has provided great insight in the way the mind works during the creative process. Albeit the incompleteness of models, psychologists have figured out patterns that shape the way people behave while having an idea.

One interesting questions is *how much time does it take to generate an idea?* The reader would do good in taking some time to think about the topic, and the answer is not short of a riddle. Some people would consider it to be instant, referring to the so-called *eureka moment*. Other people would answer it could take a lifetime to have that great idea you are looking for. Other would more safely and evasively say it depends. And to some extent they would all be right.

The process for generating successfully a good idea requires of some mental processing, but such a processing tends to happen in the background in some sense. Reflection happens in a non-sequential way. Solutions seem to pop out of the blue. This has been called by E. de Bono *lateral thinking*, as opposed to *vertical thinking*. The latter is used to express rational and sequential problem solving processes. The way we solve it is rather defined, and every step is logically linked to the previous. There are no surprises, the procedure is clear, and there is one answer to the question.

Lateral thinking, on the other hand, faces problems that do not have *the* ultimate solution, but rather better or worse solutions. It is necessary to explore alternatives, so the process is more chaotic, takes surprising turns, and does not follow a specific path. If you knew the path you were supposed to follow, you would know what the solution is going to look like!

The difficulty with this is that we need to break loose of our rigid mental structures, our semantic network. If you think about drinking coffee, you most probably think about drinking from a cup. You have seen hundreds – or even thousands – of coffee cups in your life. Thinking about drinking it out of a bottle is less ordinary, and it would require you to challenge that semantic network a bit. It takes some more time, and some more exploring, to come up with concepts involving this.

This is called rigidness, and it is related to the process neurons follow to retain information. When we go through a path, and it is positively reinforced – that means, we get what we wanted to get – then this path becomes more likely to be taken again. If you drank coffee from a cup, and it worked, why explore more? Our brain prefers to dedicate time to focus on tasks where we see more potential for improvement, or greater challenges. Such greater challenges normally also challenge our creativity, they force us to explore paths that we had not crossed before. The effect of this is associated with this perception of novelty, this amusement by creative ideas. That is one of the main reasons why creativity is so important in advertising, or why we laugh at jokes. Exploring new paths "tickles".

Sometimes, these new ideas are so positively reinforced, that we think *why didn't I think this before?*

Due to this level of parallel thinking, the brain needs some time to process and explore ideas. That is why many people say it takes much time to get to the ultimate idea you are looking for. And that is also one of the reasons why good ideas many times come to you in the shower. That is why G. Wallas – and many experts after him – map the creative problem-solving process to the following steps:

Preparation: The question is posed and defined, and different constraints are pointed out.

Incubation: It involves internal restructuring of the patterns in our brain. It is a non-conscious process, and the time required depends on the problem and the idea to be generated.

Intimation: A pattern arises that seems to make sense. The idea is not yet generated, but some parts of it already start being coherent. People have the feeling that *they are getting somewhere*.

Illumination: The idea jumps to conscious level. This is the so-called *eureka moment* after Aristotle's expression of joy in solving a problem. It is very dependent on the environment: the person needs to be relaxed, and the environment needs to be favorable to new ideas.

Verification: The new idea is tested to ensure it meets the expectations.

One important trait of this process is that, albeit the sequential description, it happens in parallel for the different patterns and ideas. Because of the nature of this incubation, some people recommend *walking away* from the problem to let the brain rearrange. Others speak about creating a relaxed atmosphere to ensure that illumination happens. Others swap problems, so the first problem seems easier when you get back to it. Others provide random stimuli so that the patterns during incubation are wider. The ways of using the knowledge on this process are numerous.

1.3 Creativity and the person's traits

Studies of creativity are mainly framed in the discipline of psychology, and much of our understanding comes from other insights gained in this field. At the end of the day, a creative person is a person and a creative behavior is a behavior. And they all have mental processes behind them.

In particular, the aforementioned processes related to vertical and lateral thinking relate much to the concepts of conscious and unconscious. Creativity seems to fall, after evidence on the process, on this second level of behaviors, of which we are not fully aware.

In particular, traits of a person can strongly influence the way they come up with new solutions. Differences in intelligence may have an obvious influence on the patterns that the person has been capable of developing. Personality traits as to how problems affect us – and how we affect problems – may also. This section explores those two concepts somewhat more in depth.

1.3.1 Intelligence and creativity

What do we understand by intelligence? When surveying non-experts, one of the most common answers is a combination of problem-solving, verbal and social capabilities. F. Galton was one of the first to try to measure intelligence, using sensory acuity as a proxy. But it was not until much later when C. Spearman started measuring different non-correlated "intelligences". All in all, there seems to be a strong link to the capability of guiding thought, to face challenges in an active, interactive and reflective way.

The question that arises then is... is creativity part of intelligence? Or the other way around?

According to J.P. Guilford's structure of intelligence, creativity is a set of facets of intelligence. In divergent production, some creative abilities are spotted:

- Sensitivity to a problem: ability to recognize problems.
- Fluency: ability to produce rapidly various ideas, associate words or organize words in a sentence.
- Flexibility: ability of adapting, be it by need or spontaneously.
- Originality: ability to produce ideas that are new.

R. Sternberg and T. Lubart, to the contrary, conceive intelligence as a trait of creative people, but as only one part of their creativity. They complement intelligence with other necessary traits, such as knowledge, thinking style, personality, motivation and environment. From intelligence they take some traits that are necessary: being good at generating solutions, critic with one's ideas and selecting only the most competent ones, and being involved in applying those ideas in reality. The link to knowledge is particularly interesting. Too less knowledge hinders creativity, but too much knowledge naturally provokes rigidness. This is a potential danger for creativity.

When assessing both of them as independent terms, it is interesting to analyze the overlap. Descriptive studies show that creative people tend to have above-average intelligence, and particularly that outstandingly creative people in history have had very high intelligence assessments. However, the opposite is not necessarily true: highly intelligent people cannot be proven to be particularly creative. When correlation is directly studied, the correlation is weak and depends strongly on the subset that is measured. The correlation seems strong on the lower part of the scale, though: people with a low intelligence are lowly creative, in an almost proportional way. Above average, creativity seems to imply intelligence but not the other way around.

1.3.2 Personality and creativity

Personality refers to the particular combination of psychological traits – such as emotions or attitudes – of an individual. It follows a unique combination for each particular person.

Some people speak about creative personalities, as that of someone who is consistently creative. But what traits influence this? As happens with intelligence, the term *personality* itself holds some disagreement as to what it encompasses. Aristotle tried long ago to infer human character from physical attributes, and Hippocrates associated bodily fluids to personality traits. Since then, focus has been rather put on the persons traits directly. G. Alport and H.S. Odbert found almost 18.000 words in the English dictionary to describe personality, with some 4.500 being trait-like words (adjectives). R. Catell then reduced this into 16 personality factors, namely *warmth*, *reasoning*, *emotional stability*, *dominance*, *liveliness*, *rule-consciousness*, *social boldness*, *sensitivity*, *vigilance*, *abstractedness*, *privateness*, *apprehension*, *openness to change*, *self-reliance*, *perfectionism* and *tension*. For each one of them, the level can be high or low, the latter not being necessarily negative. For example, low warmth would describe somebody who is formal, reserved or impersonal.

These factors have been further seen to be correlated, in five more global factors. Although this synthesis was done before, it was popularized by L. Goldberg as the *Big Five*. These factors are:

1. Extraversion
2. Agreeableness
3. Conscientiousness
4. Openness to experience
5. Neuroticism

Psychologist using the humanistic approach have pointed out the importance of understanding why an individual behaves the way it does. They pointed to the issues of *self*, *self-actualization*, *health*, *hope*, *love*, *creativity*, *nature*, *being*, *becoming* and *individuality*.

Creativity only started to be paired with personality – in the scientific arena – in the early 1980's. F.X. Barron related it to aesthetic sensitivity, broad interests, attraction to complexity, independence of judgment, intuition, high energy level, self-confidence, and creative self-concept. Later G.J. Feist described them as autonomous, introverted, open to new experiences, norm-doubting, self-confident, self-accepting, driven, ambitious, dominant, hostile, and impulsive. He pointed

out in the *Big Five* model that *extraversion* and *openness to experience* had a particular relevance.

It can be seen that the relation between personality and creativity is a two-sided arrow: personality traits influence creativity, and creative performance can influence personality traits. What seems surely clear is that some personality traits can be creativity blockers. Intolerance, low willingness for new experience, or restricted fields of interest constitute arid soils for creative tasks.

1.4 Conclusions

As has been seen, creativity is a field in which much has been said, but still much remains to be said. Since it applies to so many disciplines, and to so many contexts, the points of view are various. However, having knowledge on the different concepts presented in this chapter will hopefully give the reader a competitive edge when facing creative tasks. Knowing how your creativity works can let you get more out of it. It can teach you to be more creative.

Chapter 2

Development of a creative idea

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Having *the* idea is not a random occurrence. Not only can a proper setting be nurtured, it needs to be worked through to make sure it is successfully implemented. This chapter presents a process that can drive teams towards that final success.

2.1 Setting the target

A good idea may *happen* in various different situations: while you are thinking of a problem, while you are *not* thinking of a problem, while you brush your teeth, while you are sitting in the bus, or while you are looking outside the window. And sometimes they happen while you are daydreaming.

We all have more or less experienced the daydreaming situation, where we start to give thought to a particular topic. Daydreaming is usually a comfortable situation, where we find ourselves very creative in giving thought to all the details around a particular idea.

The same comfortable situation should be present in a brainstorming session. In brainstorming, a lot of different ideas that pop into ones mind are formulated.

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Usually, the brainstorming has an initial problem definition. Hence ideas are not developed randomly for any purpose, but for a specific one.

This liberated attitude is good for developing first ideas, either for a specific predefined problem or just out of the head. But you can imagine that by just formulating those first ideas, a realization is not possible. A clear definition of the purpose is needed.

The initial ideas serve as a pool of resources for defining the goal. The goal is a formulation of the direction that has to be taken, independently of how the particular solution will look like. The goal definition states where you want to go, not how you want to get there.

Once it is defined, objectives need to be declared. When all objectives are met, we can consider we have reached our goal. Therefore, we can interpret the objectives as an overview of *how* the goal should be reached. Some of the initially daydreamed or brainstormed ideas can be, after some evaluation, retaken to become part of the objectives.

2.2 Environmental analysis

To develop an idea in a systematic way, it is important to know what you may find in the path. Inspired by product development processes, the next natural step to generating the idea would be to fully understand the environment.

Students of the course were asked to analyze the entire environmental setting of their project idea. This includes to get to know among others the competitors, customers and users, as well as other stakeholders and sources of information such as laws or regulations.

The terms *customer* and *user* have to be better distinguished. A customer is someone who pays for a product, and is not necessarily the one who uses it. Think of toys: the customers are mostly the parents who pay for the product. The users are – most of the time – the kids, who play with the toys.

Competitors are all parties who have implemented a similar idea. It is important to envision the selling proposition of each competitor, e.i. why they stand out. This can give an overview on potential niche markets, or on crafting one's Unique Selling Proposition (USP). Understanding competitors and their behavior gives an understanding of why a customer or user would pay money for the product.

The term *stakeholders* refers to all parties that are interested in the course of the process or product. Investors or shareholders are examples of such a case, as may be consumer associations or governments.

Another aspect that influences the realization of an idea, or a project in general, are existing or upcoming laws and regulations; they constitute constraints that have to be obeyed, and it is important to anticipate them.

Having an overview of the potential resources one can access is also important. Such resources include budget, networks, manpower or any other physical resources such as an appropriate workplace.

2.3 State of the art

When you have an idea, you might not be the first one or only one to have had it. Before developing all details of the idea, it is very important to get to know what is already out in the market. This helps to save time, money and energy you put into your idea, and also avoids later frustration. The state of the art analysis gives an overview of what is out in the market at a particular moment.

In case of a new product or a particular innovation, it would be a good idea to conduct a patent research. This will help to find out whether the ideas have already been realized and whether the implementation is already protected.

From the moment you have an idea to the moment you implement it, much time can pass. It is important to bear this in mind, as in the meanwhile someone could have implemented something similar. While implementing the idea, it is also important to further analyze and track what is going on. This process is called *monitoring*. In case of patents for example, the time between applying for a patent until it is made public is up to 18 months. Even if a state of the art is conducted, the latest patents researched have been applied 18 months before, and it is not possible to find out which patents are currently being processed by the responsible authorities. Monitoring is then an important strategy to stay up to date with the latest outcomes.

One more note: even if the state of the art analysis shows that a similar idea is already available, it does not necessarily mean that your idea should not be further processed. It becomes critical to have a clear vision of your Unique Selling Proposition and Value Proposition.

2.4 Idea generation

Once the whole context is well known, it is time to solve the problems that have risen, that have been perceived in competitors, or that have been detected in customers. It is the time to be creative! For this, it is proposed to use creativity techniques.

The selection of the technique – or even the decision of employing a technique or not! – is left to the team. Nevertheless, some suggestions are made. In particular, a technique that stands out when trying to deal with creative problem solving and team dynamics at the same time is *the Six Thinking Hats*, proposed by E. de Bono. Due to its strong focus on group dynamics, its success relies strongly on the facilitator's skills.

There are many different ways that a problem can be faced. We can try to see different faces to it. If we do it spontaneously, we have the risk of trying to see all of them at the same time! For example, if we decide what car to buy, and we are contemplating a small city car, we may be thinking at the same time about how convenient it will be to park it in the city, how we could be more comfortable in long trips if it were bigger, how we may solve this problem by renting a caravan during those special occasions, and whether you need to take a solution before your vacations in August. Of course, for the final decision we want to include all factors, but... how to do it without going insane, or without prioritizing whatever we intuitively thought of last?

The principle behind the Six Thinking hats is the following: *when facing a problem, there are six possible mindsets that we can use*, each represented by a hat. Structuring these mindsets is bound to give better solutions, since we can allocate and dedicate time conveniently. Additionally, we let each one of those hats reason completely before going into the next step.

This becomes particularly relevant in teams, and even more so in teams with complex dynamics. Aligning the way people are thinking will avoid conflicts, and will let people focus on the task instead of in potential mindblocks.

The six hats are the following:

White hat : It represents facts and data, and it responds to the way of thinking in which we are trying to gather or share as much information as possible. If we have some information that is relevant to solve the problem, through this hat we mention it to the team or note it down. If we have some doubts on information, with this hat we raise the question to the rest of the team, or we try to find that information.

Green hat : It represents novelty and freedom of thought. Judgment is canceled temporarily, and the more original an idea the better. The goal is to explore very different things. If it has not been proposed yet, the green hat is supposed to say it!

Yellow hat : It represents optimism and positive logics. It focuses on advantages and strong points. When speaking about a problem or a situation, through this hat we see the opportunities.

Black hat : It represents criticism and negative logics. What could go wrong? What is bad about an idea? When dealing with a problem, through this hat we are able to see the difficulties that we are going to encounter. When facing a solution, this hat shows us the risks.

Red hat : It represents emotions and feelings, and is the one that lets us channel the *gut feeling* for a particular idea or issue. The red hat allows us to express an opinion that is unjustified or seems illogical, but that we have nevertheless. Intuition is a very important asset, and through the red hat we are able to let it out and speak.

Blue hat : It focuses on the process, and coordinates the session. Through the blue hat we do not speak about the problem, but rather about how we are solving it. With this hat it is possible to decide whether to continue or stop the meeting, whether the level of detail of a solution is enough for the purpose of the task, etc.

The fact of wearing a hat – or some visual reference – is actually pretty relevant. They constitute a visual aid of where in the process the team is, and the perfect excuse to act the traits of the hat that would normally be perceived as negative: the white hat is nosy or brings up external topics without solving the problem, the green hat is silly, the yellow hat is naive, the black hat rands about other's ideas without constructing, the red hat does not justify opinions, and the blue hat just does not care about the problem!

This method forces everybody to take each one of the roles, and to avoid people getting stuck in their natural roles. But the "imposed" roles need to be structured in a convenient way. There is no strict rule regarding this order, and it is always better to leave some degree of flexibility for the facilitator to adapt to the team's results and mood. Admittedly, there are some good ideas regarding the order. Starting with a blue hat to set the goal of the session, or a white hat so that everybody understands the problem, seems coherent. From that point onwards, the order should depend on how the process is going. The facilitator should be good with the blue hat! Sometimes it is good to put the green hat on to explore some alternatives, or to put the black hat on to define the challenges in the problem. If the team's motivation is at stake, putting the yellow hat may build up the confidence so that people see themselves solving the problem. If there are motivational problems, it's a good idea to start with the red hat.

To finalize, it is convenient to end with a blue hat, speaking about how to proceed from this point onwards. This general good practice has a hat of its own, so it is good to remember to end with blue. It will ensure that participants see the benefits of the meeting, and assess whether it was productive or not.

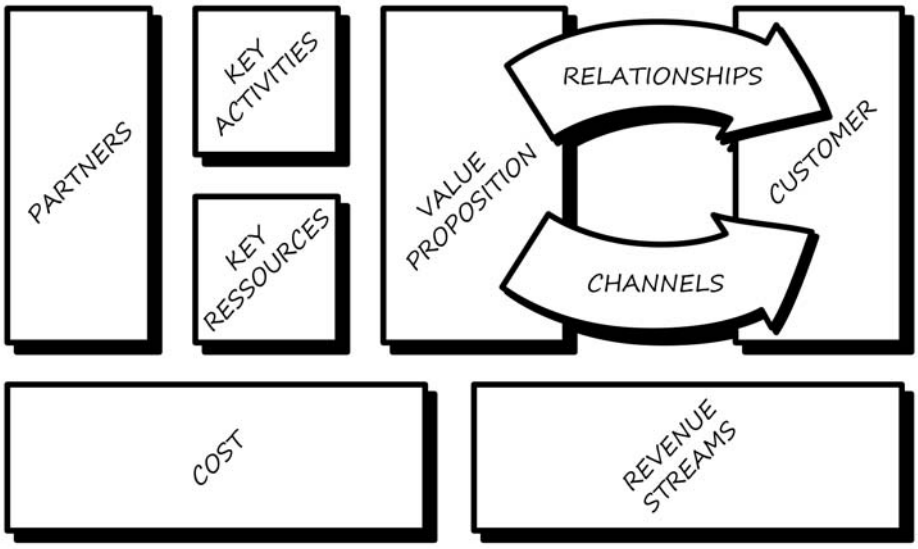

Figure 2.1: The business model canvas, by Osterwalder

After applying this technique, or of having a creativity session in any case, the group should have a conceptual design of what they wish to deliver to reach their goals.

2.5 Conceptualization of the business

Creativity sessions deliver raw ideas. In order to turn them into tangible business solutions, additional factors need to be considered. What is the final value proposition? How will the business get in contact with its customers? Who and how are they? What activities will the company do? With whom? All these questions need to be answered to fully define the business model.

A. Osterwalder developed an ontology of topics to develop in order to do so, and further structured them as what is know as the *Business Model Canvas*. The canvas holds the nine topics that need to be discussed in depth. Figure 2.1 shows how these elements appear in space.

The order in which they are discussed depends on the business that is being developed. Some businesses start by figuring out the different relationships they have with their customer, because that is where they innovate. Others find a creative way of getting revenue (thus making the service cost-effective for the user, or even free). In conventional businesses (or those that sell a specific product or service) there is some level of structure that can be followed. This is a way to

avoid dependencies in the process. The elements to be considered, and in the most conventional order, are as follows.

Value proposition: Why do customers buy the product or order the service? One of the key matters to consider in a business is what value it gives to society, or to a part thereof. It is the key description of the company, strongly related to its mission. In the case of innovative businesses, it is important for it to be unique, and therefore it is also related to the Unique Selling Proposition (USP) mentioned before. The reason for advising this topic to be covered first is because it strongly shapes the rest of the business, and most specially the importance of each topic. Having a too weak value proposition will probably make the business model very weak itself. Having a value proposition that spreads along many topics will be an enormous challenge to communicate to potential customers.

Customer: In most areas of business, it is strategic to understand your customer. At the end of the day, without customers there is no business! In this section of the canvas, a thorough analysis should be carried out as to who will take advantage of the value proposition, and what their context is. Their interest, consumption criteria, or even everyday life, become protagonist at this point. It is sometimes advisable to go out and ask potential customers, to gain a better understanding. As was considered before, beware of the difference between customer and user, since it may be quite relevant at this point!

Relationships: The way to engage with customers does not only depend on knowing about them: it is also important to plan how to communicate and relate to them. Whether the relationship is constant or sporadic, whether there is a pure efficiency reason or rather an emotional attachment of the customer with our product, or even the feedback we get from them, fit this part of the model.

Channels: In order to get our products or services out, they need to get to the customer. Relationships are intangible, but at some point we need to deliver something tangible to them. It is also important to plan ahead how we will be doing this, since it has an influence in how the product or service is consumed.

Key activities: What do we need to do in order to run the business? There are many activities that take place, but some of them will be critical for the company's success. At this point they should be spotted and prioritized, to know the purpose of actions and how they relate to the rest of the model.

Key resources: In order to carry out the activities, some resources need to be put in place. They could be physical resources, financial, or personnel. Understanding which ones are key in the business allows us to understand the level of investment needed, or the risks associated to resources.

Partners: All companies are part of an environment in which other institutions operate. In very rare cases does a company start up – or later work – dissociated from the rest. Having partners is most of the time key to success. At this point, the strategic partners should be decided and the way to interact with them should be defined.

Revenue streams: At the end of the day, the company needs to make money! At this point, different strategies for gaining that benefit can be explored. Some companies are innovative at this point. In what range are the prices expected to be, or for what sort of services is the customer going to pay, are important things to keep in mind when filling in this part of the canvas.

Costs: Related to the different resources and activities, the company will have associated costs. Accounting for them – specially for the key ones, the ones that are mainly going to shape the way the company performs – is important when defining a model, so that it is possible to assess whether some resources, activities, or parameters might be excessive for the revenue.

The position of the different items in the canvas is not casual: the central part constitutes the core of the model, the offering that the company does. The right part focuses on the market and how the link with it is established. The left part is rather internal, and focuses on what is going to be running "in the background", as well as what is critical from the foreground. Finally, the bottom part focuses on financial aspects, keeping as well some level of homogeneity on the left and right parts.

2.6 Risk assessment

Plans normally assume some standard conditions. We assume a relatively uniform environment. However, we all know that the environment very rarely reacts exactly as planned. There are many factors that may change, and that provokes risks for our project.

A risk can be understood as a possible change in the predicted environment that can compromise the results of our project. From that definition, there are some very important points that are worth developing on.

Firstly, it is a *possible* change. That means there is no certainty that it will happen, but it may. If we know it will happen, then it is no longer a risk: it's a challenge! This implies that risks will have a *probability* associated to them, or at least a level of likeliness.

Secondly, it is a change in the *environment*. It is not something that the project team can decide on. If it were, then it would not be a risk, just something that

has not been done yet! Therefore, risks require some level of monitoring to keep track of whether the possibility has materialized or not.

Thirdly and finally, it may *compromise the result* of our project. It could decrease the quality, delay our project, or constitute an extra cost. In a broader conception, it could compromise our relation with some stakeholders. That is why we need to watch out for them! Of course, different risks will have different impacts, and in particular different so-called *severity*. There are many ways of measuring severity, including subjective assessments, but one common way is relating them to the money loss in case the risk materializes itself.

There are different levels of detail in which risks can be assessed. In some projects, or at a very preliminary stage of the project, sometimes it is enough to list the risks and leave the rest for subjective assessment. If there is more time, or at later stages of the project, is is important to make an assessment of probability and severity. A simple way would be to assess it in a subjective scale. If there are more stakes, assessing the actual probability and severity (in % and currency units) is a good idea.

For example, if you are organizing an outdoor event, you have the risk of it raining, or of there being a typhoon that impedes people from going to the place where you are holding it. The first is more likely, but rather less severe. The second would normally be very unlikely, but extremely severe.

Once the risks are known, the strategy to follow regarding them should be set. Obviously, most reactions have a cost associated to them, so it is important to study whether it pays off to act in a particular way or another. The possible strategies are:

Accept and ignore. This means not doing anything, and obviously implies no additional budget. Nevertheless, if the risk comes to happen, the full severity is assumed.

Transfer to an external stakeholder. Normally, this would imply an insurance company, that would put a price to the insurance and then assume the consequences if the risk materializes.

Mitigate and reduce the effect. Sometimes, measures can be taken so that if the risk happens, it is not so severe. In the case of the outdoor event, you can organize a venue just in case, and have a bus company be prepared in case you need to take the people there. It will have its costs, but you make sure the event can take place and people do not get wet, limiting the severity.

Avoid completely. This implies making some change so that the effects of the risk have no influence in the project quality. In the outdoor event, it could imply installing a tent so that people will be covered, even if it does not rain.

For the level of detail in which ideas are developed here, normally there would not be a strict numerical assessment. Nevertheless, if severity is measured in currency units, you can assess the magnitude of the risk as the multiplication of severity with probability. If that magnitude is higher than the cost for eliminating, mitigating or transferring it, it would be important to invest in it.

It is also important at this point to develop, if the project steps forward, a contingency plan in which to include what environmental variables are monitored – to see if the risks come to happen – and what reactions are expected if they seem to indicate that the risk is happening.

2.7 Closure and further steps

Once all the previous topics have been assessed, the team should have a competent and complete vision of the business model concept. This point is however not the end of the race, but rather the beginning! At this point is when the team should start executing the different tasks, actually engaging with the partners, and getting financed the different resources. Although the purpose of this book, and of the Creativity Engineering Summer school, is not to follow up on this in the official curriculum, it is important to consider this when structuring the process.

The following chapters present the work of each one of the groups in the Creativity Engineering Summer school. They were all presented with the concepts in the previous chapters, and they developed their own ideas up to the point of presenting competent business models the last day. The description of their business models take the form of the chapters that follow.

PART II

Project work

Chapter 3

Collaboration between SMEs and universities

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Keywords: Communication, Innovation, Project work

3.1 Abstract

Due to the increasing need of small and medium enterprises (SMEs) to be innovative and state of the art, the improvement of the collaboration between them and university professionals has become necessary. The aim of this paper is to point out the need for an effective collaboration between SMEs and university professionals and propose an innovative platform in order to establish communication and collaboration in problem solving and seeking for innovation.

There have been numerous efforts to describe the needs for the implementation of successful collaborations. Nevertheless, despite the fact that these needs have been reported thoroughly, none of the available implementations address all of them in a successful way.

After having analyzed the requirements for the collaboration between SMEs and university members to take place, it was deemed necessary to address each one of those requirements with an appropriate and feasible set of tools, technologies and

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strategies that would allow a collaboration between SMEs and university members to take place effectively. In the end, the best approach for achieving an efficient collaboration between SMEs and university members according to our analysis was a combination of technologies, namely a web platform, congresses, meetings and an intermediary facilitator. This paper deals with the first two phases of the development process, the further course of the process is described in the outlook.

3.2 Introduction

Small and medium enterprises are one of the most important participants in the Austrian economic system. 61,23% of the overall sales revenue in Austria is generated by SMEs [17] and 60,37% of the employees are working at SMEs [17]. We are already used to big companies communicating and cooperating with university professionals in many different ways. It is apparent that both participants - companies and university professionals - benefit from such collaborations.

SMEs are not using those opportunities yet. They can not afford to use the same ways of cooperation as big companies do, e.g. hiring students or sponsor projects in order to do researches on a specific topic. Therefore it is necessary to establish other ways of communication for SMEs.

Addressing university professionals is a highly underestimated possibility of solving problems. On the one hand, it is an affordable way to get appropriate solutions. On the other hand, they are often more aware of todays technology than others. Using the latest technologies is very important for companies in order to succeed against competitors.

But not only companies would profit, professionals from university would also benefit. Especially students would get the chance to apply the knowledge they are gaining from a theoretical point of view. The experience they gain would also help them later on in their working environment. Further the professionals are supposed to earn money which is an important incentive.

Apparently there is a high potential which is not used at the moment. In other countries SMEs are already communicating with universities. A survey showed that in the UK 74% of the SMEs were cooperating with universities during the last year [13].

Although there are already some different approaches even in Austria, none of them succeeded. One of the key points in order to create a new platform for communication is to analyze the existing approaches in order to find out what they did wrong and to find out about the requirements. Another way of getting information is to contact representatives of SMEs, e.g. the WKO (Wirtschaftskammer Österreich). Further there are departments of universities which are also dealing

with SMEs, e.g. the department for SME-Management. One other way is to do a survey among SMEs.

The requirements are very important for generating and evaluating appropriate ideas. After evaluating all ideas, it is also necessary to find out whether they fit together. It is absolutely necessary to establish a coherent communication concept.

In the first analysis it turned out that the most important point is to establish a high participation. Therefore it is a main goal to identify the blockers and barriers of communication between SMEs and university professionals.

3.3 State of the art

3.3.1 Analysis of the situation in UK

The concept of collaboration between SME's and universities has no long history. It has been clear, especially after the last economic crisis, that in a global market environment SME's must find reliable and cheap solutions to deal with their problems without seeking help from expensive consultant services. Thus, there have been numerous efforts in order to enable, optimize and enhance the communication and collaboration of SME's with universities in sake of problem solving and innovation.

UK is a pioneer country in the field of communication between SMEs and universities. Some years ago, regional development policies turned from attracting multinationals in depressed areas in establishing hi-tech science parks that could connect to local firms [3]. They have also developed the so-called "cluster concept" for SME's that describes how small firms with a common and related set of technologies could contribute in the building of local skills and capabilities and benefit the society through networked supply chain relationships [8].

According to relative studies, in the UK market 59% of the SMEs concern with innovation and bringing new products to the market.

On the other hand, there is a part of the scientific community raising objections about the successful collaboration of this kind, based on the argument that there is an inherent mismatch between the fundamental science research interests of universities and market application needs of most SMEs [4, 7, 11, 6]. Also, in the case of hi-tech SME's there is the matter of intellectual property rights and protecting proprietary knowledge [1]. These are two of the fundamental barriers to our project.

3.3.2 Present ways of communication

According to Hendry et al. [3], the most important reasons why SMEs and academic institutions are collaborating are the following:

- Use of university faculty or other research staff as advisors and consultants.
- A direct source of staff recruitment at graduate or post-graduate level.
- Any form of funding connection on research to solve particular problems.
- A source of start-ups by students or staff leaving directly from a university.
- A source of product ideas and proven technologies.
- Use of university facilities and equipment.

It would be useful to quote some of the companies reasoning for supporting and promoting those types of communication. These opinions are expressed after a thorough research conducted in [3], and, although they are expressed from hi-tech companies, we believe that they could be useful in our case also, as they are not localized and they express general concerns that all SME's face. This is because in Austria there are a lot of hi-tech companies that fall in the category of SMEs.

> "We look for research and development people who have a reasonable amount of industry experience in a research laboratory plus a first degree. Some of them have a Ph.D. Engineers are expected to be able to contribute to a project within one week of joining and be up to full speed within one month. They are expected to keep up-to-date with developments themselves by attending one or two technical conferences a year." (Company A, UK)

> "We have had a number of research and development contracts with external agencies such as companies and universities, but as far as we are concerned they are all aimed at 'raising our technology base'. In other words, we use these projects to improve our knowledge and scale in making epitaxy wafers as part of the overall research attempt to get higher end-user product performance and functionality. Sometimes these projects will result in a published specification of a new epitaxy wafer for use in a new kind of product, but more often than not the outcome for us is increased skill and knowledge that allows us to be more responsive to our customer demands." (Company B, Wales)

> "We do not fund any product-oriented research in the universities because of the need to keep technology information proprietary - especially in a locality where you have two direct competitors very close to each other and likely to use similar resources at the university." (Company C, Arizona)

"We have close links with the local college. Most of the people that work here have come through the college. There is a facility up at the college called the PDC (Product Development Center), which is there to help develop new product ideas. The general idea is that if the PDC cannot help the originator of the idea, then the idea is passed on to us. We have facilities for prototype manufacturing, and if we cannot manufacture from scratch we can source parts and assemble equipment." (Company D, Wales)

"In many ways the frontier work being done on applications is being done by us. Doubtless there is research into basic science going on in universities, but it is not changing significantly enough for it to have an impact on the application side in the immediate future. What happens is that technology gets developed and filters through to one or two high profile applications. Then it just sits there and rots until someone like us comes along and uses that technology in more mundane applications." (Company E, Wales)

3.3.3 Needs of the market in order to improve collaboration

After researching on the scientific sources, it was found out that in literature there already have been proposed numerous solutions for improving the present communication state. These suggestions led us to create a set of features that any collaboration attempt should take into account along its implementation [3].

Communication channels

- Involvement of university staff and experts in business network events & forums
- Involvement of business people in university issues
- E-platforms used for communication
- "Speed dating" for SME & universities, facilitated by a "counselor" to get targeted results in a short time
- Communication training for all parties - communication, teamwork, team building - creating trust, influencing active listening
- Communication of existing opportunities
- Existence of events, congresses, workshops, conferences

Interface

- Existence of a so-called "one stop shop" for all commercial activities, staffed by multidisciplinary, dedicated SME liaison teams, which network internally and externally, having knowledge of business support organizations, professionals institutions, etc.
- Existence of dedicated web sites
- Categorization of university resources

Marketing

- Constant informative material to local/ national press in order to increase the "profile" of the issues of SME - university partnerships through a series of events and articles
- Existence of brochures giving information on how an SME could contact the academic institution in order to solve problems, to seek for innovative solutions etc.
- Existence of "business - friendly" university websites with appropriate portals
- Existence of an appropriate "intermediate entity" or "mediator" in order to translate the academic language to the business environment, in order for them to understand the guidelines and scientific processes.

Change of attitude

It has been reported that the universities themselves should change their attitude in order to make their professionals to adapt this "business - oriented" attitude. They could proceed to some fundamental changes, which include [3]:

- The Vice Chancellors, head of departments and/ or government could lead and provide motivation and buy-in from all areas and present drivers for academics.
- It is currently not in the career interests of academic staff to deal with small business.
- Improve the commercial awareness of universities. To do this there must be resources and (not purely academic) staff with decision making capacity.
- With regards intellectual property issues, universities need to be less risk-averse

- Improve graduate employability skills - include an entrepreneurial element to courses and promote UK placement schemes.
- Become more outward looking - exploit single European Market for standards - best products e.g. in Healthcare Applications, "write once, deploy everywhere" - adopt a "shared purpose".

Assistance & Incentives for SMEs

- Reduce the administrative burden to SMEs of participating in grant funded schemes, they currently demand too much onerous paperwork.
- Introduce "Collaboration Angels" - an application writing service - to help get KTPs and other schemes up and running (currently it takes months).
- Universities to perform work at less than FEC and make a longer term commitment to an idea / development in exchange for a share of future revenue / profit before tax.
- Develop framework agreements to enable groups of SMEs to benefit from HEI services.
- Academics encourage students to go out into the SME market place and research. potential thesis / dissertation projects so that universities approach an SME with a need.
- Create & manage a data base of SMEs who are potential partners for idea innovations rather than spinning out a new company.

3.3.4 Analysis of the competition

The case of Northampton University

On the homepage of Northampton University[5] there is a section that is called "Business & Community". On this webpage the collaboration techniques of Northampton University with SMEs in terms of providing innovative solutions are presented thoroughly.

Northampton is one of the universities that has understood all the needs presented above and is addressing them in a creative way, implementing most of the techniques described. It provides the so-called "Enterprise Club", which is a forum for exchanging ideas, concerns and solutions with the companies. It also dedicates Knowledge Exchange Teams and a "Portfolio Innovation Center", which is a

[5] www.northampton.ac.uk

dedicated center where 'early stage' businesses in the design, digital and creative sector can rent affordable workspaces with appropriate facilities. In addition, the university arranges regularly informal meetings, congresses and conferences between companies and the professionals of the university itself in order to exchange information, ideas, solutions and knowledge.

Last but not least, the university collaboration platform has adopted some effective marketing techniques in order to advertise the platform. The very well structured webpage, as well as brochures and special advertisements in specialized and non-specialized press are samples of those marketing techniques.

To sum up, the implementation of the university is not limited in developing the collaborative techniques, but also encouraging SMEs, start-ups, students and professionals in general in using them and changing their attitude. A lack of this platform is that it is only only a web-based platform, on which professionals belonging to the academic environment can contact the companies and address their problems, post their solutions and interact with them in various ways.

The case of St. Gallen University

The approach of St. Gallen University in Switzerland is different. On their webpage someone can see the section "For Companies", which describes the possible ways of communication. These ways include mainly conferences and meetings between local and national firms in order for the latter to come in contact with talented and motivated students of all academic levels. There are also two officials recruiting fairs, which are taking place twice a year. There are also digital channels through which the companies could be advertised inside the university affiliates. The main difference of St. Gallen University with Northamptom University in UK, is that Northampton has invested a lot in the marketing and commercialization of the collaboration platform, something that in the case of St. Gallens is not obvious.

The case of Cambridge University

Cambridge University is one of the best universities of the world, so someone could expect that they would have developed innovative platforms of collaboration between the academic professionals and the companies that would like to gain knowledge from the academic environment. Indeed, they have proceeded some steps in this direction, but we could not allege that we saw something more innovative than Northampton's approach.

The implemented communication methods follow the same philosophy as St. Gallen University. There are again special meetings between the companies and the

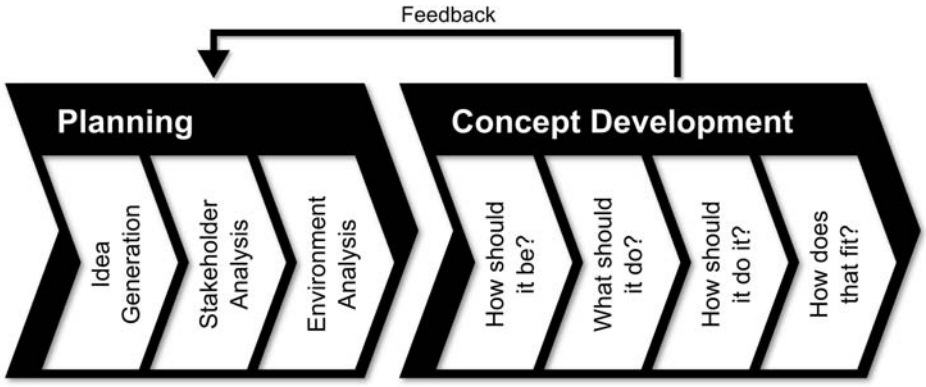

Figure 3.1: Steps in the development process

universities, dedicated teams willing to help companies contact specific professionals, and special contact Conferences held in regular time intervals.

3.4 Methods and tools

This chapter describes the development process, its phases and activities, and the methods and tools that are used.

3.4.1 The development process

A development process is the sequence of phases and activities which are employed to conceive, design, and commercialize a product. Many of these steps and activities are intellectual and organizational rather than physical.

The development process, as shown in Figure 3.1, consists of two main phases: planning and concept development. The planning phase consists of the phases of idea generation, stakeholder analysis and environmental analysis. The concept development phase details the solution further, dealing with the following questions.

- How should it be?
- What should it do?
- How should it do it?
- How does that fit?

A method or tool is an established, habitual, logical, or prescribed practice or systematic process of achieving certain ends with accuracy and efficiency, usually in an ordered sequence of fixed steps.

In the planning phase of the development process, the following methods and tools were used:

- Brainstorming, a group creativity technique by which a group tries to find a solution for a specific problem by gathering a list of ideas free and spontaneously by its members. The ideas are not assessed directly to generate various, new and unusual ideas. There are some basic principles and rules to consider:
  - Quantity over quality
  - No criticism or evaluation
  - Visualization of all ideas is a must
  - Building on another idea is allowed, there is no intellectual property
  - The more unusual the better
  - Create undisturbed atmosphere
  - Mental warm-up to activate the "fantasy-mode"
  - Define number of ideas to set a target and to create incentives
  - Use progressivity to tap reserves
- Brainwriting, the free writing down of ideas with respect to some basic principles of Brainstorming. The advantages to Brainstorming are, that the written form more involves quieter participants into the idea gathering, it is anonymous and the ideas can be elaborated better.
- Six Thinking Hats, see section 2.4.

In the concept development phase of the development process, the following methods and tools, were used:

- Morphological analysis, a technique which breaks down the task into its individual elements. For each of the individual elements a solution is searched by brainstorming. Finally, various solution combinations are compiled. Variations are the conceptual, the modifying and the sequential morphology.
- Six Thinking Hats, see section 2.4.
- Elevator pitch, a presentation technique which is used to quickly and simply define a product, service, or organization and its value proposition. The presentation shall be understandable, punctually and in the time of a short elevator ride.
- Business Model Canvas, see section 2.5

3.5 Concept description

The collaboration between university members and SME should be based on a small projects base. These projects must focus on localized and specific problematic areas in the companies, where the potential of improvement and innovation is large.

Companies have to address the problem to the university members in a standardized manner. University members must then diagnose the problematic situation and propose new and efficient solutions to the company owners/manager. The involvement of managers and collaborators of SME and the clearly definition of their roles in the project are fundamental issues for the collaboration success.

In order to achieve a frequent participation of the SMEs and the university members on the collaboration process it is deemed important to have a clear understanding of the main benefits of both parties.

The benefits for the university members during the collaboration process with SMEs is the opportunity to participate in projects and solve real problems by empirically applying the knowledge acquired at the university. Thereby, they gain work experience and have the possibility to train their own skills.

The benefits for the SMEs during the collaboration process with university members is the opportunity to access mainly young students that want to apply their knowledge and skills to the problematic situation in order to find solutions for it.

Furthermore, to achieve a proper collaboration between SMEs and university members, there needs to be a possibility to directly access the individual members of both parties. Also, a set of communication tools should be available to the members of both parties in order to allow them to properly interact with each other.

3.6 Detail description

The collaboration between SMEs and university members can take place in many different platforms. In order to recognize which collaborative platform would perform better, it is deemed necessary to have a better understanding of the requirements of both parties for a collaboration.

The set of requirements is by any means incomplete, as it is based only on the preliminary analysis we did of the competitors around the world. An in depth analysis of the local target group is deemed necessary to better understand what the best approach would be for the collaboration between SMEs and university members to efficiently take place.

Having an understanding of the needs of both parties we addressed some of the requirements with a feasible set of technologies, tools and strategies that would allow for a collaboration between SMEs and university members to effectively and efficiently take place.

3.6.1 The requirements of both parties for a constant collaboration

For SME

Find solutions for their problems : Problem formulation dedicated to online profiles with a set of specific indicators, but also accessible to a broader audience of university members within the web platform.

Access professionals on specific fields : Profiles for the university members with a set of indicators that facilitate the understanding of their skills, competences and experience.

Innovation : By using a proposal system that allows university members to propose a solution for a problem; there is an encouragement to approach the solution of the problem in an innovative way in order for the proposal to be chosen by the SME.

Networking : In order for the SMEs and university members to interact more with each other the need for congresses that should take place on a regular basis is deemed necessary. This will encourage a face-to-face dialogue between both parties and allow developing a better understanding of the company and of the possibilities of improvement and innovation.

For university members

Work experience : The work experience acquired by providing solutions to SMEs allow university members to improve their curriculum vitae. A validation of the work experience is necessary to allow the university member to show what they have done.

Find SMEs for interaction : Profiles for SMEs are necessary for the university members to find in different ways the SMEs that better relate to their skills, competences and interests. The profiles for the SMEs should have a basic set of indicators that depict them properly.

Empirical application of knowledge : This is very important for university members, as it is nowadays very difficult to find opportunities to participate in real-life projects at companies. It is necessary to facilitate the finding of problem formulations posted by SMEs.

Training of skills and competences : The proposal of solutions for the problem formulations posted by SMEs should work similarly to the way business proposals work. The goal is not for the collaboration between SMEs and university members to be a training platform for university members, but to deliver good feasible solutions for the problem formulations posted by the SMEs.

Networking : In order for students to better understand the businesses for which they are bringing solutions, there should be a possibility for students to access congresses and meetings of specific industries where they can also offer their services. That would also work as a way for companies to gain ideas on how to benefit from the collaboration.

3.6.2 The type of interaction required

For SMEs

Problem formulation : A standardized problem formulation sheet is deemed necessary in order for the process to seamlessly take place. The problem formulation should also have a price tag that could work as an incentive for university members to participate more with solution proposals. There should also be a deadline for the university members to deliver their solution proposals. This dynamic would work as a motivator and a speed upper for the proposal process. The SMEs should also have the possibility to organize meetings whenever a better understanding of a problem is necessary.

Solution recipient and selection : When university members post a solution to a problem, they are automatically agreeing to the set of terms and conditions of the collaboration. The SMEs then have the ability to access all the solution proposals and choose the best one that fits to their criteria.

For university members

Access problem formulations : Only people with a university email address can access the problem formulations and they need to have a profile accessible by the SMEs for whom they post a solution proposal. Once they have a profile on the web platform they can edit their indicators for education, interest and experience to get only those problem formulations fitting to their profile.

Solution proposals : There needs to be a standardized solution proposal sheet so that the understanding of the solution is easy for both parties. There should also be some instructional data on how to write the solution proposals

so that any participant has the same advantage while participating in the collaboration.

3.6.3 The language level of both parties required to communicate

As the level of language of the SMEs and the university members is different, we noted a need for a intermediate facilitator to moderate the interaction between the parties whenever it is deemed necessary by any of the parties. There should also be a possibility to address an intermediate facilitator at meetings and congresses.

According to our preliminary analysis of the competitors, the best approach towards a collaboration between SMEs and university members would be a combination of different technologies, tools and strategies:

- Web Platforms with profiles for people and SMEs
- Congresses
- Meetings
- Intermediary facilitator

All of this technologies, tools and strategies could change after having analyzed more thoroughly the target market.

3.7 Conclusion and outlook

In order to set up new ways of collaboration between it was necessary to first get an overview of who are the customers, clients, stakeholders and competitors. After getting an image of the environment the goal was to find out about the requirements of the clients namely SMEs and university professionals especially students. In this stadium of the project the chosen way in order to achieve setting up the requirements was to analyze existing needs of the market and on the other hand to study existing collaborations. The most important requirements for SMEs are finding cheap and appropriate solutions, having the chance for innovations and to access professionals on specific fields. Professionals from universities want to gain experience, apply their knowledge and train their skills and competences. An important requirement for both clients is networking. Beside those needs there is another very important point which is participation. Without a constant and high participation of both parties the collaboration is not going to succeed.

Several creativity tools and methods like Brainstorming, Brainwriting and the Six Thinking Hats were used in order to generate ideas. In order to evaluate the

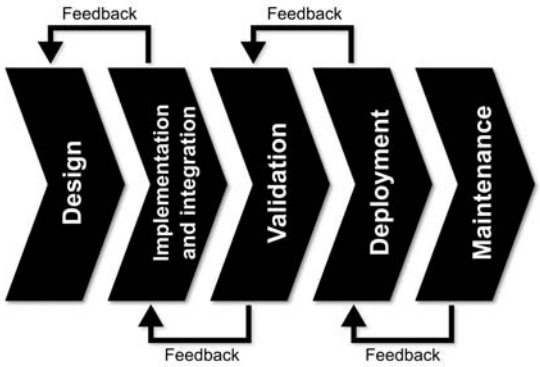

Figure 3.2: The further development process

generated ideas we compared with the requirements to select only the appropriate ones. After listing the most promising ideas it was still necessary to prove whether all the different ideas fit together in order to create an overall package.

The focus is on 4 different ideas: A web platform, an intermediary facilitator, congresses and meetings. The web platform is supposed to be the main platform for communication where problems are posted and professionals can apply for solving them. Another function is to present the participants in the way of profiles. An intermediary facilitator is going to be a communication link between SMEs and professionals because there is often a difference between the levels of expressing. Congresses should be an opportunity to improve the whole system by getting feedback of the clients, getting in contact with others and gain insight on how to further benefit from the collaboration. Meetings are supposed to be a platform for networking, exchanging ideas and getting inputs from others.

The benefits of a collaboration between SMEs and universities are on both sides. On the one hand companies have the chance to solve problems in a cheap and competent way. On the other hand university professionals can apply their knowledge, gain experience and earn money.

The progress of the project is located at the end of the concept development phase. In the further course of the project, the following phases must be passed as also shown in Figure 3.2:

Design : The design phase is a process of solving and planning for a software solution. After the purpose and specifications are determined, a plan for a solution needs to be developed. It includes low-level component and algorithm implementation issues as well as the architectural view. The architecture is the scheme by which functional elements of the product are arranged. Product architecture decisions impact product change, product

variety, component standardization, product performance, manufacturability, and product development management. The outcome is a complete specification of the product.

Implementation and integration : In the integration phase of the process, the components of the subsystems are brought together into one system. It needs to be ensured, that the subsystems function together as a system. In the case of this project, integration is the process of linking together different computing systems and software applications physically or functionally, to act as a coordinated whole.

Validation : Testing is an investigation conducted to provide stakeholders with information about the quality of the product or service under test. Testing can also provide an objective, independent view of the product or service to allow the business to appreciate and understand the risks of the implementation. Testing can be stated as the process of validating and verifying that the product or service:

- meets the requirements that guided its design and development,
- works as expected, and
- can be implemented with the same characteristics.

Deployment : This phase includes all activities that make a system available for use. The general deployment process consists of several interrelated activities with possible transitions between them. These activities can occur at the producer site or at the consumer site or both. Because every software system is unique, the precise processes or procedures within each activity can hardly be defined. Therefore, deployment should be interpreted as a general process that has to be customized according to specific requirements or characteristics.

Maintenance : Maintenance, in the case of this project, is the modification of a product or service after delivery to correct faults, to improve performance or other attributes. Maintenance merely involves fixing bugs. The key maintenance issues are both managerial and technical.

Chapter 4

Feel the music: A portable vibration device for the deaf

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Keywords: Interaction, Hard to hear, Musical expression, Perception

Abstract

The aim of this project is to understand the environment and needs of deaf and hard to hear people to develop a portable vibration device to enhance music perception. An interactive platform for the creation of new ways of musical expression is discussed. This paper presents an introduction to the world of sound and its silence, giving some glimpses about the creativity process that generated the idea as well as its development through different methods and techniques. A business model was developed to meet the needs of our customers, understand the market's dynamics, establish relationships and make marketing decisions, combined with a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis to predict the strategic position of the product and anticipate the scenery (outcomes).

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4.1 Introduction

Why did we choose this idea? First of all we were moved by the inspirational force of the idea to develop a product for a segment of the market for disabled persons who are partially or totally unable to hear. Our affection and devotion for music drove us to take this challenge in order to try to provide these people the opportunity to express themselves through this powerful and boundless form of art. Aware of the potential of this idea, we wanted to give to shape it, and bring its content out in form of a product to reach people with audible disabilities.

After identifying the market and its underlying potential, the interest on developing this project went up. With our ideas we believe we can create more than a product, we can generate a whole sub-culture attached to it. And that would be something completely new. Striving for innovation pushed us forward. Although not being experts in the technical field, we wish to build a product from scratch and have a whole set of ideas which we identify as propulsive for this product.

We identify ourselves with creativity, with innovation and the strive for the survival of an idea. Our background, our personalities, our willingness to accept new challenges and the common taste for music encouraged us to undertake this project.

4.2 State of the art

> "Music is the movement of sound to reach the soul for the education of its virtue." Plato

Existing between sound and silence, music is among one of the first experiences of a human being and an essential part of each and every culture. It breaks the boundaries and ties us all together, moves us through its rhythms, heals us and leads us all to a deeper perception of life. Composed by a mix of steadiness and vibration, sound waves are sensed by our ears and perceived by our brain.

Sound waves are vibrations of molecules in the air that present wavelength, amplitude and purity. Wavelengths are interpreted by the brain as the frequency (number of waves or cycles per second) or pitch, amplitude (size of vertical waves) is interpreted as volume, and purity is called timbre, which refers to the richness in the tone of the sound. The waves reach the outer ear, travel through the ear channel and hit the eardrum, making the bones in the middle ear to vibrate. A region called *Cochlea* is filled with liquid that carries the vibrations to thousands of hair cells that produce electric signals through the nerves reaching the brain that finally translates it into sound. The audio frequency (AF) "is the periodic vibration whose frequency is audible to the average human. It is the property of sound that most determines pitch and is measured in hertz (Hz)" [16]. The sound range of a human being is between 20hz and 20.000hz.

Grade of Impairment	Audiometric ISO value (average of 500, 1000, 2000, 4000Hz)	Impairment description
0 (no impairment)	25dBHL or less	No or very slight hearing problems. Able to hear whispers.
1 (Slight impairment)	26-40dBHL	Able to hear and repeat words spoken in normal voice at 1 meter
2 (Moderate impairment)	41-60dBHL	Able to hear and repeat words using raised voice at 1 meter
3 (Severe impairment)	61-80dBHL	Able to hear some words when shouted into better ear
4 (Profound impairment including deafness)	81dBHL or greater	Unable to hear and understand even a shouted voice

Table 4.1: Description of grade of hearing impairment [5]

Indicated by the hearing sensitivity that an animal can detect, the hearing threshold can be measured by a behavioral audiogram. A record of the lowest sound is made and the listener response is measured. Different sounds and frequencies are tested and the final results will determine if there is any hearing impairment and which part of the ear is affected. There are two kinds of hearing impairment:

- Conductive, that is a treatable problem in the outer or middle ear.
- Sensorineural, that is usually a non-treatable problem with the inner ear.

The severity of a hearing impairment is measured and ranked according to the grade indicated in Table 4.1.

In respect to the Deaf Community, the terms "hearing impaired", handicapped", or "disabled" will not be used in this paper. Instead, the term "deaf" will be used to technically describe a hearing loss for sounds ranging from 81dBHL or greater, in one or two ears, and the term "hard to hear" referring to both complete and partial hearing loss for sounds ranging from 26dBHL to greater, according to WHO's grade [18]. Deaf, as understood by the Deaf Community, is a term used to describe members who share common values, norms, traditions, language (Sign Language) and behaviors. They celebrate and cherish their culture because it gives them the unique privilege of sharing a common history and language.

Some deaf or hard to hear people will only be able to experience a tune by placing their hands on a sound device surface or directly on the speakers or analog amplifiers. The musical world is still unreachable for the most of them, as well as the emotions that music provoke in hearing people. The curiosity and need to understand it brings up a very basic necessity: to understand the world around us

and interact with it. The musical world as a means of artistic expression is also not often accessible to this specific group of individuals that have the same will to produce works of art and share their impressions, messages and feelings.

4.2.1 Competitors analysis

Research projects have been developed in the area of Cymatics, which is a subset of modal phenomena, that studies vibration and visible sound. Some products currently in the market are making use of Cymatics and indirect competitors were found, like vibration headphones and vibrapods; a platform called T-Rhythm, that helps children during the music learning process, providing them with a device that is used to recognize patterns in music pieces, is being developed by Tokyo University; and also the Emoti-Chairs, developed by Ryerson University, have a computer inside each chair analyzing sound frequencies and translating them into mechanical responses - including motion, vibration, and blasts of air on the face.

No direct competitors were offering the same product or service, with the same-targeted field or using the similar advertising tactics, which makes our product novel in the market. Our main differentiation from those products is portability, interactivity, accessibility, convenience and design.

Some of the available technologies and services for the deaf or hard to hear are:

Open captioning contain dialogue as well as descriptions of sounds and music - vital elements that set the tone and texture of a production.

Interpreters are facilitators for cross-cultural communication by converting one language into another, translating concepts and ideas between languages.

Music visualization that generates animated imagery based on a piece of music, usually rendered in real time and synchronized with the music as it is played.

Vibration devices that convert some frequencies of sound waves into vibrations.

4.2.2 Problem statement

There are currently very few devices that can translate music frequencies into vibration, with the objective to enhance music perception among deaf and hard to hear individuals; none of them are portable or offer creative & interactive features.

4.3 Method and tools

The idea for our product was originated through a Brainstorming session which was then voted using a flip chart. Groups were made to work in the most voted ideas.

On the starting stage, we began by developing our idea using The Six Thinking Hats. By attributing 6 different colors to 6 different discussion aspects we could focus on one specific discussion aspect at a time. By doing so, we could expose and explore the ideas of the group's members exhaustingly, and filtrate the ones which revealed themselves to be the most creative ones.

After this stage, we started to approach the business model Canvas. At first individually, we made a research on each of the Canvas' divisions which we then confronted in group in order to complement them. For this, we used the classroom material, the presentations provided through the University platform, class notes and the Internet.

We elaborated a questionnaire which we sent to the Austrian Association of Inaudible (Österreichischer Gehörlosebund) "Without Barriers" though we did not get any answers until the moment of preparing this paper.

4.4 Concept description

Value proposition : For deaf teenagers and young adults who have the need to enhance music perception, the proposed vibration device is a portable device that enables people to feel music through vibration, with the whole body. Unlike existing vibration devices our product offers accessibility and design focused on the deaf community. The device presents a completely new music perception concept. The marketing name of the device has be chosen to be *Deaf Beat*, in short DB.

Channels : Channels are the ways our product - as well as the information and promotion it involves - reach our costumers. First of all we want to have a channel to create product awareness. This will be achieved by developing a website (which will also work as a platform for interactivity purposes) and taking advantage of the possibilities that digital marketing offers. Advertisement will take place in specialty websites (banners) and web media (online magazines and newspapers).

Furthermore, we also lay a high stake on physical marketing through the press and later on billboards, and DB stores/points, social marketing through lectures and conferences in schools, associations, societies, some selected television channels (MTV, VH1, Redbull channel, and other alike) and through the Internet platform

Evaluation is a crucial part of the survival of this product. Users can use the website platform and we can maintain a constant, active research in order to find how our product is being rated and what we can improve.

Purchasing is also part of channels our value proposition has to go through in order to reach the final customers. This will be available mainly through online and physical DB Stores. DB Stores are available for both, to seed some curiosity on the market and to give customer the possibility to try our product, experience its functions and acquire it.

But the value of our product does not end there. After-sales is a complementary part of the product. We offer our users the opportunity to have assisted and coached experiences of the product through local representatives (music teacher or coach). Online registration through the device's serial number allows members to receive news and updates.

We finally need to define how we want deliver the product to the hands of our costumers. Delivering the product itself can be done via home delivery (shipping) or through the acquisition in one of the DB Stores. Contents after sale are delivered free to users through the online portal. Persons who do not possess a device can also be members by doing a paid subscription.

Relationships : Relationships with our customers are characterized as being "warm" in the sense of carefully understanding their needs and putting together a product which reflects care. Personal assistance is available through local representatives or can be organized on countries or regions where the product is not available or are hard to reach by the standard channels. A vital part of our whole proposition relies on the relationship we have with the final customers. The subsequent connection of people will allow the creation of forums, working communities, co-creation between artists and users.

From the set of all the activities we need to perform to keep our business flow sustainable, we selected the ones we think are crucial to create a vibration music culture and sell our product. Events show our product's identity. It is important for us to organize different types of events: conferences provide knowledge and new information, concerts and festivals show the creative side of it. Both variations enhance the experience so that is why we are looking to work close with external partners in a very systematical way.

We consider the online platform itself as a creative motor and a connecting force which will allow users to exchange experiences closely with musicians, researchers and other users. Online selling is going to be a big part of the whole selling structure so we should give it special attention. From the way we present our product to the process of ordering and finally shipping, information should be clear, complete, managed and kept under tight controlling.

Key partnerships : When planning how our business will be performing it is not possible to do it without partnerships. We need qualified partners through all the stages of the development of our project. We thought about every agent

directly involved in the production, marketing and delivering of the product as partners because we really feel the need to keep a close relationship of cooperation (bidirectional) with them.

If we think in chronological terms, from the product design and production to the hands of the final customer, we can better identify who are the key partners. In first plan this is a design and technology intensive project so we need the expert designers and engineers. Of course we cannot forget that our product is going to be used on human beings so we can not dispense medical consulting.

After that stage we must consider the manufacturing scheme for our product: whether it is going to be assembled in one manufacturing site only or in several ones. So our manufacturers, schools, associations and sub-societies are also our key partners, once they are a local gateway for the market. We rely on music and sound specialists to provide content and be a source of awareness and innovation.

Logistic suppliers are also a key partner since our selling model heavily relies on shipping. These have to be intensively controlled (due to the value of our product), be trackable and provide precise information at all times.

Cost structure : When designing the cost structure of our business, we gave special attention to the fact that we are going to produce and market a value driven product with a high percentage of fixed costs associated to it. As the units produced increase this costs will decrease. R&D is the main source of the fixed costs (designers, researchers and engineers).

Manufacturing costs also represent a significant part of this structure. Unit-one will have clearly a bigger percentage of fixed costs but as production orders increase, this will decrease and variable costs will increase. As part of the cost structure we included still some relevant aspects such as stocking, distribution, online sales, employees, advertisement and prototype testing.

Key resources : We think the patents and copyrights are fundamental for the success of the strategy. Once our product is going to be a pioneer in the market, we want to keep everything well documented and registered.

We consider the promotion of our product through advertising campaigns and events as vital to maintain our goal of creating a sub-culture and promote artists. Human resources are essential since they hold the know-how and the tools to shape our product to its final result. Forming a creative team comprised of various areas like engineering, ergonomics, music and communication experts is an essential resource. As physical resources we highlight the DB store facilities and the headquarters (where the stock is also located).

Revenue Streams : The product should cost between 100-200EUR to the final customer. We want to create a quality image and not incur the risk of being

under-priced by competition (this would lead to a big loss and probably unsustainability of the project) . In the initial phase, a higher price (about 10 times the cost of production) would allow to produce and sell less units, having lower management costs and moving faster in the start-up of our production.

Most revenues should reach us through asset sales on a fixed price. This will depend also on the customer segment and volume of orders. Negotiation with associations or customers with orders in a larger scale, is possible. We want to keep a rhythm of recurring revenues and for that we make subscriptions available as well as post-purchase services, like downloads of contents, samples and event tickets.

4.5 Detail description

In order to predict the strategic position of our product in the market and anticipate its scenery, we did a study on the internal and external factors that can dictate its possibilities and drawbacks. To this purpose we chose the SWOT analysis because it gives us a generic view and it is general enough to allow later focus on the specific key-aspects. It is not supposed to be deep and extensive but only an overview of the market's surface in terms of strength, weaknesses, opportunities and threats. The combination of these will allow to make better decisions concerning strategical positioning and direction, identifying risks and solving problems.

4.5.1 SWOT analysis

Strengths : Strengths are aspects which differentiate our product from the competition. The first ones we can identify is breakthrough innovation and first-mover advantage: the combination of vibration and music for the technically deaf.

Our product goes beyond the physical touch. Unlike some competitors we focus in a bigger segment of the market which is defined as the deaf community, and not only the hearing impaired, through the creation of an interactive platform. Our product features a sub-culture using the extroverted value of music and art, it promotes the contact, the sharing of experiences and interactivity. The user's disability becomes the competitive advantage and the differentiation factor of our model because it opens a new path for the art expression.

From our point of view we did not identify a competitor product which reflects the values our product relies on which are: art, music, interaction, progression and pushing art to the next level. The market potential is relatively easy to measure and the target is easy to identify and to reach. That way activities of promotion and distribution can be developed very specifically.

Weaknesses : The product itself is highly based on technology. Manufacturers and companies who produce similar products already hold the technology and knowledge, so competition can be volatile. We must invest highly on copyrights and patents. Therefore the unit-one production costs are high relatively to the variable costs of developing subsequent units. This happens not only because of the technological volatility but also due to the high value of the know-how (the knowledge embedded in the design of the product, experts, scientists, etc.) in the total process of production.

Opportunities : Analyzing the external factors of our organization we can identify some factors which can lead to areas of the market where expansion is possible, for example new dimensions related to art and music, like partnerships with highly recognized institutions in the art and event and sports branches. We recognize the chance for the product to be used for other purposes other than leisure or creation, for example, academical teaching or medical treatments.

There is also a bridge for people with no audible disabilities to create a different kind of music expression for those who have that disability. It can as well generate the opportunity for volunteer work from artists, teachers or other interested.

Threats : Some aspects which can compromise the company's competitive advantage are for example similar products competitors may develop or the acceptance of the product by the main target users can suffer some attrition, because it is related to a specific characteristic of their lives and personality which is sensitive. Our approach should be carefully thought and planned according to very good quality sources.

In conclusion we think there is a very positive outlook for our product and with our creative approach we will be able to transform the weaknesses and threats found on this stage into competitive advantages and distance ourselves from the competition. For example, the threat of similar products from competitors can lead to synergies of distribution channels, of relationship bonds which already exist. We don not need to defeat competition, we can go for a win-win deal most of the times.

4.5.2 Marketing plan

Based on the 4P's method, first classified by McCarthy, Jerome in 1960, this technique aims to give a clearer perspective on the matters of Product, for instance; a mass production device that enhances the user's experience when listening to music by vibration. It differentiates itself from the competitors for being portable added to its interactive extended features through the use of the online platform, where users can create their versions of the same music and share it with others.

Even though this product is highly specific and has a clearly defined target market, saturation of the market is not a matter because of its price.

A high-tech product that demands high-end solutions for a specific market generates high costs that limit our penetration in the market. Our product is a high cost product, with a high value due to its aggregated concepts and experiences, that is also promoted at the place where it will be sold.

The customer of DB has to be introduced to the product's capabilities and subtleties. What better place than a physical store, where potential buyers can get in touch with the device and experience it, can be chosen? Trained employees are ready to deliver every detail of information needed to provide the kind of relationship we want to establish with our clients. Online help and buying is also viable through the website, with explanatory videos and demonstrations, that is part of the promotion of the product.

The others goals of our marketing include targeted marketing at our website, associations and related communities, both, physically and online, relying specially on the product's unique capability to deliver a unique experience and the powerful word of mouth generated by its users.

4.6 Conclusion and outlook

The final evaluation of the project leaves us with a sense of needing to know more about the deaf community and its expectations. In order to deliver a device that is fully compatible with the needs of our audience, but at the same time able to go beyond their expectations and make the use of DB as an extended part of their perception, we have to better understand our clients. What we want is to enable users to perceive, develop and share translations of pulsating chords to vibrating waves.

Further steps in this project involve developing the product's design - aesthetics, shape, size, materials, colors, texture, weight - and proof-test its design and its features through a sample of the targeted audience. Users' feedback would be implemented on the final version of the product. The interactive platform, where users shall be able to connect and share their impressions and experience, has to be developed. The platform design considers user interests, accessibility of information, positioning of areas of interest, navigation aspects, colors, fonts to be used, illustrations, etc.

In order to go through these steps, financial support is needed to help us find the answers to the questions discussed in this paper, and come to a precise product that will suit our expectations and the consumers needs.

Chapter 5

Creativity consultation service for schools

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Keywords: Creativity, Constructivism, Creativity Crisis

5.1 Abstract

Recent research in the field of education shows that students do not have proper opportunities to express to express their creativity. On a long term, this causes a reduction of the educational system's efficiency. To enhance creativity, we have decided to introduce a creativity consulting service for schools to overcome these problems. Through the project described in this paper, we collected information about the state of the art of educational system in our home country, Iran. We further developed the idea by using different creativity techniques and developing a business model. As a result, a safe and peaceful, productive and stimulating environment for students to express their creativity is proposed.

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5.2 Introduction

While the concept of *creativity* has been widely researched for over fifty years, disagreement remains among researchers as to what creativity is and how it develops. Some researchers maintain that creativity involves fluency and flexibility of thinking, originality, perceptiveness of problems, and the ability to redefine and elaborate [2]. Others point to personality attributes that make a person more creative, including tolerance for uncertainty, willingness to overcome obstacles, openness to growth, possession of personal motivation, acceptance of sensible risk-taking, wanting to be recognized, and willingness to strive for such recognition [10]. Some others believe that a person is not generally creative in all areas but more often in specific fields such as writing or carpentry [9].

Perhaps creativity is, as Daniel Boorstin suggests, "the most illusive, complex, and mysterious of all human processes". In all, we can conclude that creativity is a complex concept influenced by many factors including motivation, personality, circumstance, and thinking skills.

Research has shown that the cultivation of creativity is a key component of programs and strategies to produce positive outcomes for youth. Programs that teach children creative problem-solving skills help them to become successful adults who can question the accuracy of information and put information to constructive use [12].

Moreover, student involvement in creative activities (such as performing arts and group activities) has been found to reduce drop out rates and to improve student motivation. Mental health practitioners have also discovered that creative activities can serve to safeguard children from stress. Creative thinking allows both young people and adults to avoid boredom, resolve personal conflict, cope with increasing consumer choice, accept complexity and ambiguity, make independent judgments, use leisure time constructively, and adjust to the rapid development of new knowledge.

Nevertheless, according to recent researches children are today less active and less creative than they were only a few generations ago.

> "The most important thing that schools can do for students is to help prepare them to deal with the unexpected."[Roberta Bondar, Canadian astronaut]

5.3 State of the art

We are planning to offer a creativity consulting service to schools to improve the educational quality. Lack of creativity in schools negatively effects a person's future and social life. The intention is of the project is to provide opportunities to students to disconnect from the virtual computer world and motivate them to participate in social activities. All children are born artists, Picaso said, the problem is to remain an artist as an grown up.

The way how children perceive their environment is greatly influenced by the education they get in school. Their capabilities in schools are measured by their performance. The measurement is based on the principle of "one size fits all". No matter how much a child differs, what his/her learning style is and what his/her needs and strengths are, each child undergoes the same program following the same learning methods. If a child has a problem following the curriculum, a deficit is seen and assigned to a child. Even though the child's difficulties may have emerged because of the conservative educational system, the system is never changed. The educational system is conceptualized in such a way where children are taught to be receivers of information, not thinkers or inventors. Children are educated to be passive, obliged to listen attentively, sit throughout the class, follow the rules, obey the authority. This is certainly not an environment where creativity is nurtured. School rules simply do not apply in real word. School success is not always an indicator of success in life. How many children succeeded as adults despite their poor grades and low self confidence that school caused? And how many could not even develop their potential?

Nowadays students are not less creative, they just have less opportunities to be creative thinkers because of the educational system. We believe that it is the educational system's responsibility to make a drastic change in its mode of delivering creative problem solving skills to our youth.

Some psychologists argue that most children the age of five are creative, but only few of them remain creative afterwards. Our children's minds are filled with predetermined and fixed subjects. Thus, our children and our youth loose the ability to discover, to invent and to be creative. Children should be given the possibility to search, discover and get involved with nature, people and culture (such as watching appropriate films, going to theater, etc.). In fact, the education of children does not match to their capabilities and potential from their birth.

Our services are designed to help our clients to understand that alternative education, such as arts education or creative programming, can lead to a better quality of life.

"Developing creative skills" is often an empty phrase in the present system. Schooling in its essence is anti-creative. The situation in most schools is that lip service

is paid to the ilusion that mistakes are valued, that individuality is appraised and that new ideas are always welcome. In fact, schooling and creativity are contradictions in terms. A quick comparison of the values that prevail at school and the essential values and prerequisites of creativity, highlight their contradictory characteristics.

In fact, mistakes are punished, conformity is rewarded and regurgitation of information is appreciated. Almost unknown within the system are lateral thinking, safety to take risks and make mistakes, playing with ideas, appreciating the value of the "slow mind" (associated with creativity and wisdom) and breaking the established patterns of thinking [15].

Through a balance of self-directed and teacher-directed activities, we strive to enrich a child's social, emotional, intellectual, and physical development. In addition to being well qualified and experienced in early childhood education, we believe that a teacher should be trained and experienced in classroom management, positive reinforcement techniques, and have excellent parent/teacher communication skills. School-age programs high in quality value and actively promote a partnership with children's families. Parents are encouraged to visit and participate in their child's classroom daily activities [14].

This project is planing to give creativity consultancy to students of schools in order to help them to improve and train their creativity.

The major stakeholders in this projects are school staff, families, students and companies which are involved in any kind with school kids. The whole project shall have a big positive impact on society.

In previous generations, boys were pretended to take a job and start working in early ages. This was due to the necessity to secure income and facilitate a living. But also wealthy families pushed their children into job to make them learn new skills and collect experiences in real life. In their working environment, those young adults often spontaneously found new solutions for their daily problems in work.

The Iranian lifestyle and culture was lead by the statement: *deeply think about your role in society; think and be aware of yourself and your environment.* This thinking has lead to many great achievements in history: Architecture, poetry, music and literature.

In contrast with this thinking, nowadays families pay more attention to good grades in schools. Children are not supposed to work any longer, rather attain school to learn what is already known in a conservative educational system. It is some kind of a cultural barrier that children who ask many questions in school are conceived to be rude or impolite. Even worse, some teachers do not want any

of those students in their class. The playground for being creative is drastically reduced. We want to change this old thinking pattern by the service we provide.

5.4 Methods and tools

The *Six Thinking hats* presented by E. de Bono is a thinking tool for group discussion and individual thinking. Combined with the idea of lateral thinking associated with it, it provides a means for groups to think together more effectively, and a means to plan thinking processes in a detailed and cohesive way.

Details of our project were developed by using the Business Model Canvas. It is a strategic management tool which allows us to develop and sketch out new or existing business models. It is a visual template, pre-formatted with the nine blocks of a business model, as represented in Figure 2.1 on page 26.

5.5 Concept description

Our consultancy office wants to give opportunities to student to increase their ability of thinking of and coping with their problem. The value proposition can be described as:

1. Create an environment in which school kids feel safe to take risks and make mistakes.
2. Develop a habit of always looking for the second right answer, and the third...
3. Encourage school kids to regularly re-visit and re-examine all the rules, and change them if appropriate.
4. Find the right balance between teaching skills and inspiring creative expression.
5. Learn to suspend judgment.
6. Allow the "slow thinking, dreamy, playful mind" the time it needs to come up with new ideas.
7. Help students to redefine problems and "think across subjects".
8. Encourage creative fluency with Brainstorming activities.
9. Promote elaboration by asking students to clarify and add details to ideas/thoughts and arguments.
10. Support cooperation and a cooperative work environment.

11. Sharpen young people's vocabularies.
12. Use humor to enliven activities and minds.
13. Employ music art drama, dance, and movement into lessons.
14. Develop a passion and enthusiasm for a subject or program and be openly creative in front of others.

5.6 Detail description

The rest of the items defining the business model canvas can be further developed as presented:

Customers : Even if the user is the child, our major customers in this projects are: schools, parents, educational and art institutes. It is important to keep this in mind, as dealing with special offerings for each one of them can be a key business advantage.

Customers relationships : Stakeholders have a strong link with the results that are delivering. Creating and scheduling appointments with customers is a central activity of our business. Getting in touch with customers let us present our service and its importance.

Channels : Staying in contact with schools by sending coaches, trainers and consultants. Since it is a service, there are no additional channels.

Key activities : We are going to execute our service in different fields such as:

- Literature: Creative writing methods - asking the school kids make a story out of some unrelated and random words to help them to improve their creativity.
- Art: Giving school kids the opportunity to express themselves without any limit and consideration to theoretical cases.
- Mathematic: Maths is one of the most challenging lessons among school subjects. We are planning to use new teaching methods to make school kids interested in it by encouraging them to find solutions through alternative paths or through games.
- Chemistry: While chemistry is an exact science, the teaching of chemistry often requires creativity and improvisation. To make chemistry concepts comprehensible to students we will use fun chemistry puzzles, interactive revision quizzes and molecular models
- Sports and dance: Children love to express themselves through movement. Some new concepts of dance offer age-appropriate dances with music for kids aged 4 to 12 and provides lesson plans that incorporate Laban movement concepts and extend children's movement vocabulary.

Key resources : The key resource in this business is human resource. In particular, we need for well trained educational staff, that will deliver a consistent and high-quality training to the children. Additionally, we will hire an IT expert to guide kids to use creative software.

Partners : We are planning to work with schools and educational centers who are considered to be our main partners. Additionally, the following actions can deliver strong partners:

- Asking toy factories to cooperate with us.
- Asking for support from ministry of education.
- Cooperating with libraries.

Revenue streams : The payment follows a classical consultancy payment scheme: schools and institutes which receive our consultancy services shall pay for it.

Costs : Our costs will be concluded and categorized as following:

- Rent an office
- Staff salary
- IT infrastructure
- Hiring experts
- Mobility costs
- Insurance

5.7 Conclusion and outlook

Our overarching mission is to provoke creativity in school kids and accompany them in becoming creative adults. In our future work, we are planning to extend the idea of the consultancy office to become a new style of schools. We need to give some thoughts whether this kind of school should be an alternative to existing schools or provide complementary classes.

Chapter 6

Syglisis - A Solution on co-working environment

Madjar, L. [1], Miranda, A.D. [2],Yanping, W. [3].

Keywords: Business, Creativity, Entrepreneurship, Interaction, Job, Start-up, Students, University, Work place

6.1 Abstract

This study aims to create a shared workplace for companies and freelancers. It shall facilitate the generation of knowledge and solutions with the help of universities. Different workplace concepts shall provide the most suitable space for users and different requirements of clients and create an interactive workplace. It enables through technology, architecture and social activities facilitated collaboration the exchange of information and eases communication between different companies. This project aims to build a bridge between companies and universities so that teachers and students can help to solve problems for companies. We aim to build a place to make people work more efficiently, changing the perceptions on how work should be done and giving a new experience to everyone that is committed to it.

The basis of the concept is developed by using the methods of design thinking, feedback, business model Canvas, Brainstorming and Six Thinking Hats.

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Similar companies were found during our research, but none of them benefited from the linkage with the university, nor shared some the ideas presented in this paper.

6.2 Introduction

The development of business market and information technologies, new professions and work methods demands for new concepts of work places. The aim of our project, Syglisis, is to deliver the answer to those needs. By summing up the best of the two worlds of business and academy, a new concept of a work place and work interactions is delivered. This work place is meant for entrepreneurs, freelancers, young professionals and students whose work principles and/or needs do not fit into the classical concept of 40 work hours stuck in a office. Throughout this assignment, we will present a work place concept that is based on the table-renting system. Recently trendy work environment solutions and work dynamics will be given a twist in order to facilitate the use of academic knowledge and methods through projects conducted in this new work environment. Some existing examples of new work places in Vienna and around the world will be analyzed too.

6.3 State of the Art

In our research we discovered several examples of new working environments and we are briefly presenting two of them that exist in the capital city of Austria, Vienna:

6.3.1 The Hub Vienna

The Hub Vienna is part of a global community and a social enterprise that offers conceptual working places. The Hub is spread in 26 different cities on 5 continents, and enables people from every profession, background and culture to work with 'new frontiers', tackling the world's most leading social, cultural and environmental challenges. The Hub is a place that combines the best of a member's club, an innovation agency, a serviced office and a think-tank to create a very different kind of innovation environment. These Hubs's are places to access a variety of experiences, knowledge, finance and markets.

Hub Vienna has about 150 subscribing members. It offers users space to work, to connect and to learn. The philosophy of the Hub is to contribute to the global development of social entrepreneurship in Vienna. Hub Vienna gains most of the money needed from the memberships and renting the Hub for organization of events, lectures, team buildings, etc.

6.3.2 Sektor 5 - Co-working place Vienna

A big co-working space for 75 people with a conference room, 'coffee-corner', chill out zones, phone/skype room, (smokers)-terrace and - that's the most important thing - an analogue network of inspiring people working on their visions.

> "We are the pulse of time, which requires us to learn beyond our own's nose and to be flexible. We are no longer sitting in dusty offices and annoy ourselves via rigid times, antiquated rules and inflexible people. We are free to work, travel for it, leave us on ever-new colleagues and connect with our self with what we do." Sektor 5 webpage[1]

6.3.3 Other cases

Co-working spaces are emerging in all big and highly developed cities around the world. Small business owners, entrepreneurs and freelancers based in Toronto (Canada) have at least five co-working places that offer different possibilities to work, connect and develop new businesses as it is described in the Erin Bury blog post on BlogTo [2]. The places are: Cloud Free Agent Espresso Bar, Center for Social Innovation, The Toronto Reference Library, The MARS Center. There are several positive responses of users of these co-working spaces.

In cities with highly developed economics, a variety of different professionals and creative industries workers are using public spaces (libraries, coffee bars, parks) to meet, connect and work.

Many coffee bars are also enabling free use of Internet and are allowing people to use their space as a relaxed working space. But coffee bars, libraries, parks and all other public spaces simply can not offer all the comfort and fulfill all the needs of an efficient work place. The development of The Hub all around the world and the success of Sektor 5 in Vienna clearly shows that there is a growing need about rethinking the standard solutions of working spaces and dynamics. The example of the different places in Toronto indicates that there is also a need for a variety of alternative co-working places in each developed city.

[1] http://www.sektor5.at/
[2] http://www.blogto.com/

6.3.4 Conclusion

These briefly presented trends extend the work possibilities in every city around the world. In the next chapters we will present ideas for new conceptual co-working places and present the tools and methods that we used to design our concept.

6.4 Methods and tools

We used different idea generation techniques added with project design methods to come up with a unique concept and business model. The concept stands as the base of a strategic business plan to develop this shared workplace.

Before coming up with any specific ideas on the project, we thought to take a better look at what we are looking at. "3W1H" method was used to analyze and better define the project. "3W1H" stands for: *What, Who, How and Why* - What we are going to do? Who will be our customers or users? How will we serve them? Why will they come to the workplace?

The method of design thinking is widely used on the development of new products and services and/or their improvement. This method was the pathway to develop the raw idea of an engaging work place into a project that could be further developed into a business plan and finally executed as a new service. The method of design thinking as a frame to better define includes:

- The problem definition and search for opportunities,
- Concept development,
- Content development,
- System and place definition,
- Definition of customers,
- Definition of stakeholders,
- Definition of competitors,
- Business model development,
- Planning further steps in development of a project (prototyping & testing, financial analysis, marketing, release, evaluation).

In the phase of idea generation we used Brainstorming and Six Thinking Hats, see section 2.4.

The Elevator pitch presentation and group discussion was done after the Six Thinking Hats. We used this method to briefly present the idea to the other groups and receive their feedback on the process. it helped us to gain a different perspective and provided us new solutions. We focused on a brief explanation to share the core idea, answering these key questions:

- What is the idea of interactive workplace?
- Who are the customers or audience?
- How will the idea be applied?
- Why do we believe the idea is important?

The elevator pitch exercise was a good opportunity to present the core idea and receive feedback from other students. The feedback was positive and we even received some new ideas for additional services (special short-term membership for foreigners) and tools (interactive board with job offers and announcements, interests coded bracelets to be used on social events).

We also used Internet as research tool to find all sorts of information about existing co-working places, scientific articles about interactive work, expert blogs and web pages.

To systematically arrange the ideas and realize how far we have gotten through, the Business Model Canvas model was used. It is a strategic management tool, which led us to develop and sketch out a business model for our idea. The results are described in section 6.6.2.

6.5 Concept description

The idea of a shared workplace came as a solution for two different problems:

1. Knowledge generated in institutions like companies and universities is kept inside lockers or libraries
2. Negative impacts of the work environment and work philosophy on the employees' drive to get results done and generate new solutions to old questions.

Many companies, especially the ones that rely greatly on the creativity of their employees, noticed that the established work models are creativity blockers instead of creativity enablers - a big obstacle if one is working in the creativity business. Other companies just do not feel that stuffing their employees on cubicles is the best way to give them the value they have. A creative work environment provides

the opportunity of making questions about the processes and coming up with new solutions.

Another benefit of the shared workplace is the possibility to observe how other companies have solved a similar problem. By giving a twist to existing solutions, the existing solution can be adapted to specific requirements.

The shared workplace is not only about a company. Workers benefit greatly from interactions that arise from a dynamic environment, generating satisfaction and the feeling of easiness and pleasure on getting the job done. It is a win-win situation, where companies obviously benefit from the different perspectives on any matter or any problem, and from the worker's perspective, the satisfaction of not being chained to a tight structure that burdens the work. It is also about the freedom of looking for answers in none of the usual ways. Academia has a lot of experience in doing this. Scientific research leads to different approaches on problems, coming up with answers to everyday questions backed up by different methods and data.

And that is what this project is about: Designing a place where project developers looking to benefit from a collaborative workplace - are directly connected to the institutions of knowledge (university, research institutes, consultants). Furthermore, they can benefit from integrating the praxis of a wide range of companies, by giving it a twist to fit the own needs.

The results of applying "3W1H" show better the concept of this idea:

What : Working on the idea of a shared workplace. It is a place and service that will offer a new opportunity to do work, connect and get inspired to set up new business.

Who : Students, young professionals, freelancers, start-up companies.

How : Students and freelancers' working; professionals, companies and universities' meeting; learning from the shared knowledge generated by the parties.

Why : Offering new jobs and new ways of working; new business opportunities; sharing clustered knowledge; benefiting from the interface of different companies and institutions.

By putting these companies in a human and information resourceful environment and stimulating the different clusters to interact, the output is maximized based on the multiplicity of experiences. Having the right people at the right place, reliability decision-making in a work environment is put into reliable paths.

6.6 Detail description

In the following paragraphs we are presenting key insights for the better understanding of our idea. We developed the idea by using Six Thinking Hats and Business Model Canvas.

6.6.1 Concept of the place

Based on the table-renting system, different companies, freelancers and professionals with different background and different goals would work in the same environment. The rent can be paid on a daily, weekly or monthly base, depending on what suits the customers needs.

Daily activities, like lectures or workshops would be promoted and opened to the public, with the objective to generate networking and knowledge to pretty much everyone that is interested. The goal is to make extend the working place to a meeting point; a cool place to hang out. At the outer areas, incomers could drink coffee, have meals, surf in the Internet and access the no-cost digital library of books, all open to the public - and more important, it is also a place for students to be.

Users (companies, freelancers, students, etc.) in the inner area would have access to connected universities. Practically, this would allow users to talk for example one day with a marketing student about planning advertisement strategies and the other day with a statistics major, on evaluating which is the best way to mathematically approach a specific survey. One or more of students, depending on the complexity of the demand, would get in touch with the company under the supervision of a teacher or professor. Together, they would help the company with the specific task. The students would benefit by adding up experience to their curriculum, and the company would take advantage of getting the job done.

There is also the opportunity for people and companies that are not related to any specific project to go to our place and just look around. They will get informed what the companies or projects inside are looking for through an electronic board, e.g. an experienced designer to come up with a solution to the website of a company or for example a supplier that is looking forward to distribute its new solution on software or goods. The interested people may then get in touch with company to start a possible cooperation.

A specific proactive employee is dedicated to help companies with networking. This person would be at Syglisis everyday, welcoming all companies, freelancers, students and teachers, and talk to them about the projects they are developing. The Networking expert would give advice on whom to approach about specific job related matters. Interaction is beneficial and profitable, and networking is

priceless. Every day right at the beginning of the work hours, a different warm-up exercise is promoted, giving additional help for people to interact with each other.

Every one who is related to the interactive workplace would be registered immediately on our web system. There they can relate to companies also not present at the workplace, see what they are looking for and what they have already achieved, relate keywords to their projects, look for users that have the profile they are looking for to hire, start online debates about the appropriate approach on a specific matter and see who has applied to the job they offered, get their contact and schedule a job interview.

The interactive workplace is not only about working. Once in a while, every piece of furniture is going to be pilled up in the corner of the room, and a party would be organized. After all, the quality of the work developed has everything to do with how comfortable you are with yourself. Some relaxing time once in a while helps everyone to get relaxed, give some extra gas to keep on going. On these events, a color coded system would be implemented in bracelets, necklaces, or bands, that would immediately identify people with the same interests. This indicates either knowledge about a subject or the intention to to talk about it (differentiated by symbols).

If a company is ready to take the next step and move on to a place of its own, we are ready to offer some money in exchange of a percentage of partnership on their business, which generates no cost to the start-up company that is moving out.

One of our sources of income lies on the membership mode, based on the trust discount model. Membership mode develops customer confidence, which also plays a great role over competition. The customers pay a specific lump-sum in order to obtain further discount. We can generate fast money flow to our funds by playing an important role on the development of the enterprise. The users might also apply for the daily ticket, granting a day for all-access to working space, or even a weekly ticket. A conference room will also be rented based on the full hours of use, and it is also open for companies that are not based on our facilities.

6.6.2 Business Model Canvas

With business model Canvas, we put our conceptual idea in a business context. Business model Canvas helped us to better understand the idea detached from the emotional aspects, dealing solely with the value of the proposal.

The outcomes of using the model was:

Value proposition :

- Shared workplace for networking and idea generation

- Connecting or socializing space
- Knowledge generation
- Job offers

Customers :

- Project developers like freelancers and subscribing start-up companies
- *Investing* companies
- Professionals
- University students
- General public

Relations and chanels :

- Face-to-face
- Web based environment

Strategic Partners :

- Universities contain professors and students in different majors
- Consultant companies
- City council
- Public employment service (e.g. AMS)
- Business incubators
- Coffee shops or restaurants

Key resources :

- Place
- Copyright of books
- Intellectual property of research
- Financial support to start-up
- Human resources (networking expert, event manager)

Key activities :

- Table renting system
- Job announcements
- Networking events
- Education events
- Library

Relationships :

- Deep trust relation
- Permanent engagement

Costs :

- Architecture design
- Marketing and visual identity
- Fixed cost (energy, water, tax, internet, rental, personnel)
- Events
- Furniture
- Site and system programming
- IT infrastructure

Revenue Streams :

- Renting system
- Membership cards
- Job announcements
- Partnership with different companies that are leaving us to develop their own business
- Advertisement on websites
- Out coming solution; company from outside who want to show project here
- Rental of coffee place, percentage of meals and coffee sold

6.6.3 Application of the six thinking hats

The results of applying the Six Thinking Hats were:

White hat : Gather data and define important questions:

- Salary is not the most important motivation for work.
- Interactive workplace can develop new work motivations.
- There are examples of good practices of co-working places in Vienna and around the world.
- Interactive workplace should be fun.
- What kind of interaction are we looking for? Who should interact? What are the benefits for the users?

Black hat : Negative things, controversial threats, kill the ideas, but be logical:

- Not effective for interaction goals.
- No special benefits for the business, networking, gaining knowledge.
- Lack of privacy for users.
- Possible problems with intellectual property (stealing of ideas).
- There is no guaranty that people will be interested in using this kind of place.
- Can the place be profitable?
- Help from universities and business is not guaranteed.
- There are competitors on the market.

Green hat : Create new ideas:

- Job offering board.
- Color, symbol arm band on events for connecting.
- Professional staff to motivate users integrating, helping users to connect with consultants and universities.
- Professionals coming around just to help.
- Internet service.
- Daily warm-up.
- Idea generation day.
- Idea storage with linking and users.
- Lectures for a low price for start-ups.
- Lecture day.
- Closed rooms for meetings.
- Virtual library.
- Individual tables.
- Interactive tables that identify interests.
- Tables separated by subjects.
- Connecting with investors.
- Membership cards.
- Discounts for companies promoting events and hiring people at our place.

Red hat : Emotional feeling about generated ideas, could be without reasons:

- We had a positive emotional feeling about the listed ideas.

Yellow hat : Positive and logical arguments for the generated ideas:

- The membership cards help to get the time value of money, so that we get the greatest possible use of funds. Discounts for companies help to keep our big clients. Daily warm-up fully mobilizes the enthusiasm of everyone and also develop creativity. People can access to knowledge from the library. Tables separated by subjects bring people who concentrate on the same subject together to share ideas....etc.

Blue hat : Controlling a process: Creativity session closed in scheduled time.

6.6.4 Elevator Pitch

Syglisis is a service that offers new opportunity how to do work, connect and get inspired for developing new business ideas. The services will be mainly provided for young professionals, freelancers, entrepreneurs, start-ups and students. We believe that the place will awake the interest of companies and investors looking for young talented people and new business ideas. Syglisis will be a mixture of working place, meeting and connecting point and place to get new knowledge and information.

These new conceptual workplace will be successful because it will offer a new work opportunity to young talented people. A unique social program for connecting people and up to date inspiring educational program will stimulate a development of many new breakthrough business ideas.

> Question for the audience/reader: How do you perceive your work place? What would you like to change? How would you describe your best working experience?

6.7 Conclusion and outlook

Traditional work environment tends to tie people to their working space. It is not efficient for the sustainable development of the enterprise - when we have the same experiences and perception everyday, we can not deliver new results.

Many freelancers work from home or public places like coffee bars, but the results of this kind of working dynamic do not lead to improvement of the outcome.

As a creative solution for people who are unsatisfied with their office work or their home-working, for people who are aiming to deliver a richer experience on a flexible work environment for companies, taking the benefits of a shared work space with direct interaction with different enterprises, professionals and university, maximizing the opportunities of closing new contracts and getting a broader perspective of a service and/or product, we developed a co-working environment called "SYGLISIS", which is the Greek word for *Converge* - a workplace that is born from

market opportunity with a big potential. We are sure that this kind of workplace will have a positive effect on work efficiency and on the workers' satisfaction.

There are some similar companies operating around the world, and we can learn a lot from their experience - we are going to study in further details their modus operandi; our proposed ideas might change after consideration. What we have not seen in the analyzed cases is that these co-working places are directly linked with universities, offering a healthy exchange of knowledge and experience. We are sure that developing cooperation between businesses and universities in new ways, offers new business opportunities.

The implementation of SYGLISIS will play an important role on easing the work pressure, improving work efficiency, stimulating new answers and new perspectives on problems, finding the right employees and getting a good job.

Based on all the reasons above, we consider this project as a feasible one.

The *main value* of the concept we have developed are the services that will enable the development of long term relations between the users of SYGLISIS and universities. The benefits of this cooperation will be a continuous co-creation of high quality business solutions.

With the work done in last week our team managed to develop a basic concept for shared working place. For further development of the concept and launch of a place, we think it would be necessary to follow the next steps:

Setting up a local team : A local team should be formed and review this project as presented in this assignment.

Research among potential users : The team should prepare a research that would give qualitative and quantitative data about the working habits and values among freelancers, students and start-ups in local environment. This research should be the structured basis where further development of the concept will lead to a long term success.

Detailed strategic and executive business plan : Business plan should include financial, marketing and communication plan and a business model that will work in local environment. The plan should be based on current assignment, further research and SWOT analysis.

Funding for the project : The team should also focus on searching for investors (companies, business angels, etc.) and look for possibilities to gain financial resources from the local or national government or EU funds.

With such a procedure, it should be possible to start this business and have it running successfully.

Chapter 7

Creative Kid's Park "The Colored steps"

Demyanenko, Y. [1], Dyrdina, A. [2], Guselnikova, O. [3].

Keywords: Children, Creativity, Sponsorship

7.1 Abstract

The creative kid's park *The Colored Steps* (CS) wants to help in the development of the creativity potential of kids, and to raise the overall education level. We believe that play is a need, not a luxury, and that every child should be given a secure environment in which to play. Creativity is the loyal companion in a child's development. Unfortunately, children spend nowadays the majority of their free time in front of computers, laptops or TV, with negative effects on their individual and social behavior. If we want to change this behavior, we should give more attention to children. And specially to their play, as a way of understanding the world and adapting to it.

Our mission is to provide those children with leisure activities, to support unfavorable families and to help parents in the upbringing of their children. The main customers for our creative park are schoolchildren, who are aged between 7 and 14 years. Classes will be organized similarly to regular school. The park itself will be constituted by a building complex with two main zones: inside and outside.

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The main idea of the park is for it to be of free entrance. We believe that children should not be charged for playing and studying. Three kinds of activities are offered: sport, creative workshops and mental facilities. Fundraising is the most difficult issue within this project: to find sponsors, companies or private investors who are interested in giving money to realize this project.

7.2 Introduction

> "A child's greatest achievements are possible in play, achievements that tomorrow will become her basic level of real action." [Lev Vygotsky, Russian Psychologist, 1896-1934]

We at CS believe that playing is a necessity for children, and we are not alone with our belief: playing is so important to optimal child development that it was recognized as a right of every child by the UN High Commission for Human Rights in 1989. It is through play that children engage at a very early age with the world around them. It is through play that they develop their imagination and creativity, that they become physically stronger, more confident and resilient. In the words of one eminent psychiatrist, play allows us to develop alternatives to violence and despair; it helps us learn perseverance and gain optimism.

7.3 State of the art

Every child has has a need to know the world by nature and to realize and develop its talents. In the years of childhood, not only individual psychological processes (sensation, perception, memory, thinking) are developed, but the personality of the child as a whole: beliefs, abilities and interests constitute the main traits of character.

Creativity is key in a child's development. However, many social factors slow down its development. Such a case happens when children feel emotional rejection of adults, when they inadvertently make mistakes, not meeting the expectations of adults. The perceived reaction to opening up and expressing their needs finds a very negative reaction, and therefore the child closes in and avoids any behavior that is not exactly what is expected from them. Another case is that of parental alcoholism. The situation can become unbearable for the child, who often ends up as a social orphans by leaving its parents.

In 2007, in the Moscow region, 15.000 young people were registered by the Departments of Internal Affairs. 3% of them lived in dysfunctional families. Children from such families are more likely to fall into a risk group: groups of children who, because of certain circumstances in their lives, are more likely subject to adverse

external influences from society and its criminal elements. There are many reasons why a child can fall into a risk group, for example:

- Antisocial behavior or drunkenness of parents.
- Child abuse.
- Homelessness.
- Running away from home and conflicts with peers.
- No responsible person for education, often leading to delinquent children.

Street children are children without supervision, attention, cares or positive influence from parents or persons responsible for their upbringing. Event though the child still has an emotional attachment to its family members, these links are fragile and are threatened with destruction and atrophy. To face these problems, there is an urgent need for the creation and strengthening of specialized agencies to assist families, children and adolescents. The creation of our proposed park will contribute solving the mentioned problems.

The main question is how to positively influence the development of students? The proposed answer is by playing with them and by helping them to develop their creative skills. This possibility should be available for every child, without exception.

Every child is talented in its own way. It is necessary to notice this talent and help the child to disclose it. Thus, developing creativity from an early age is important. Fine arts lessons solve this problem best: this is one of the most accessible and interesting ways to provoke the interest of children, involving them into exciting games in which they participate together with the supervisor. By drawing or modeling, the child gives vent to its emotions, develops creative thinking, imagination, taste, sense of color and shapes as well as fine motor skills. The latter has also a significant impact on enhancing mental performance.

Another question to address is: when does a child become interested in creativity? For children, games and playing is a method of understanding and adapting to the world. With the help of educational games, the child can learn to write, to read, to draw, to talk and to get many skills that are needed in society.

Sports is another important factor for a child's development. The ability to control the own body together with physical development determines a child's mental capacity. Scientists argue for regular exercise:

- 30% of pre-school children already show changes in posture (this quantity increases to 65% in the first years of school)

- More than 30% of babies weigh more than normal. But we are aware that fighting childhood obesity is very difficult.
- 20-25% of kids have already circulatory disorders by type of vegetative dystonia
- 40% of children regularly complain of back pain.

7.4 Methods and tools

Methods and tools used in this project to develop our idea were:

- Description of customers and users.
- Definition of stakeholders.
- Analysis of resources.
- Marketing and public relation.
- Making the plan of searching for investors.
- SWOT-analysis.
- Definition of activities.

7.5 Concept description

Strategy : The organization of free time of children from unfavorable families. The mission is to:

- Provide representatives of this layer of society with leisure activities.
- Support unfavorable families.
- Help parents in the upbringing of their children.

Marketing goal :

- To attract 450 children daily.
- To provide good finance for our kid's park through sponsorship and paid advertisement, which is located on the area of the park.

To attract potential customers, users, parents of children and schools, we will use a website. The website will be our main platform for advertisement. There, we can show our timetable and some information about the park. Volunteers can announce their interest to join and participate in our project.

In particular, this level of interaction should be attained through some level of social networking capability in the website. This would allow individuals to interact with one another to build relationships. Products and or companies can also join such sites, to interact with users in a more natural and personal way. This interaction can be done through Twitter, Facebook, Youtube or blogs, not necessarily taking the shape of an own website. Followers would be able to re-tweet and re-post comments, i.e. to communicate a particular message to all their personal contacts in the network, creating a word-of-mouth effect. This is specially powerful in case companies are willing to advertise their products through these channels (and to the restricted target market of parents of young children), since they can have a considerable visibility though the network proposed. Additionally, it will infer a greater visibility to CS as well.

7.6 Detail description

Playing is something that seems so rudimentary that many of us take it for granted, yet millions of children do not have good facilities to play. Poverty is a major cause of play deprivation, as across Russia millions of children live in basic conditions, with no space for play, either indoors or outdoors. Almost 11 million children in Russia live in poverty, and families with children account for most of Russia's poor layer. A growing proportion of these are single-parent families, with the one bread-winner having to work all hours while children are left alone to watch TV, play video games or run wild on the streets.

Our task is simple and focused: we cannot lift these families out of poverty, but we can help them by giving them the gift of clean and secure places for their children to play.

7.6.1 Why do we need it?

- 20% of drug users are pupils. There is a drastic increase drug abuse among children, aged between 9 and 13 years.
- School of survival; according to sociological researches, from 20% to 40% of russian pupils are exposed to violence from teachers.
- Every class in school has active and passive children. The latter ones are often subject to bad jokes, bullying and mockeries.
- Children spend the majority of their free time in front of computers, laptops and TV.
- Young adults begin to drink and smoke already at early ages.

- Most activity clubs for children ask for entrance or membership, in general some money.

7.6.2 How should it look?

Our play parks draw children into another world. Ships or castles, slides, swings and skate-boarding ramps made of bright multi-colored materials stand in sharp contrast to the often cold and gray urban landscapes they live in. Our play parks are played in tirelessly by the local children, who range from toddlers to 14 years olds (with preponderance of the target group, as explained below). We cater for all ages, all abilities and all backgrounds.

We ensure that our play parks are always secure so that parents can rest, knowing that their children will be safe in their play. We have 24-hour security guards on duty and fencing surrounding all of our public play parks.

Our park shall have two zones: a small two-story building and the adjacent area beside it.

Inside : First floor area is 600 square meters; a gym will locate there. This should be a room completely equipped for sport activities. On the second floor, there are two rooms: art workshop and lecture rooms, serving room and utility room.

Outside : The outside area shall have a square of around 400 square meters. This place will include playgrounds, a carousel, swings, slides and roundabouts. Most of the area should be covered by plants, trees and gardens. We will have a medical room where all children can get free of charge help in case of any accidents.

7.6.3 Users

Our main users are schoolchildren, who are aged between 7 and 14 years. Children who have no hobbies spend their time doing nothing. It may be children from unfavorable families, from families in difficult situations or from poor families. What unifies all these children is the limited attention from family, relatives or friends.

To estimate how many children we will serve, some simple calculations are done. The population of our city, Tomsk, in Russia, is around 530.000 people. 35%, around 185.000, are somehow categorized to be be needy. 9% of the children, that is around 16.000 children, are studying in schools. Considering that there are 55 schools in Tomsk, each school has in average 294 pupils. The region or area where the park can be situated, can be one of the so called *sleeping areas*. Most

people with low income live in this area. In average these areas have five schools. The number of our potential clients is around 1500 children. Since schools usually have two shifts (first shift from 8:30-13:00 for elemntary school and a second shift from 14:00-19:30), we can maximum have only half the mentioned amount (750 children) in our park at the same time. But we do not believe that we need resources to handle that amount of children at the same time. Some other factors to be considered for the expected amount of children are:

- Some children may not know about our place.
- Some children may simply not wish to visit our place. We can not – and should not – force them to join our park.
- Some children may already have some hobbies.

We will further assume that maximum 25% of the children will use our park, that is around 190 children per shift and 380 per day.

7.6.4 Project stakeholders

The different stakeholders of this projects are presented here:

Volunteers : Individuals who wish to participate in charity events may be volunteers. For example, students can organize events or arrange games for the celebration of holidays. Art specialists can give lectures to children or professional dancers may create a master class for children.

Government of the city : Realization of this project is an indication of care about the population by the city by government. This creates a positive image the city. Such kind of social projects influence the social atmosphere of the city. The park could even be a municipal institution. This would be beneficial for the project, as the custody from the government would provide stability and constant financial support.

Large companies : The establishment and continuous operation of the park needs financial support. Searching for sponsors is the main strategic task.

Workers : Each teacher working in our park should have the appropriate pedagogical education and work experience. The success of the park – to open up the creative potential of children – depends on the quality of teachers. It is their duty to create the right atmosphere, in which children will feel comfortable.

Parents : Parents have a strong impact on the child's development. They can have both positive and negative effects. A child's behavior in the classroom and its social adaptation depends on this influence.

Children : Children are the main target audience. All classes aim at developing their creative potential. Children have different preferences and different talents and levels of education; this will be considered in the curriculum.

7.6.5 Resources

This section presents the different resources needed to run CS. They will be divided in infrastructure and operating costs.

Infrastructure

1. Workspaces:
    - Open area, which should have a surface of 400m^2 — Expected costs: 500.000
    - Suitable building for studying, which should have 400m^2 — Expected costs: 1.250.000.
        - Sports hall: 200m^2
        - Art workshop hall: 50m^2
        - Classroom: 50m^2
        - Administration room, teachers' common room, toilets, store room: 20m^2
2. Furniture for inside zone, including tables, chairs, bookcases, cupboards, blackboards, benches, sofas, chairs, rugs, lights and trashcans. — Expected costs: 50.000
3. For area outside: Expected costs: 500.000EUR
    - Playground with horizontal bar
    - Swing, carousel, bench, sandbox
    - Street lighting
    - Green area design

Operating materials and costs

1. Human resources:
    - Teachers (6 people): They should have at least five years of experience. For every kind of activity, there should be two teachers. One of them can take care of the inside, another one of the outside. — Expected costs for salary: 350 per month.

- Nurse (1 person): We will have medical room, where all children can get help with no costs. — Expected costs: 250 per month.
- Director (1 person): A person able to take the responsibility, with excellent organization skills, who can manage problems and critical or conflict situations. — Expected costs for salary: 500 per month.
- Yardman (2 people): We need to have clean areas, because it is very important for children to be in a good sanitary conditions. — Expected costs for salary: 150 per month
- Cleaning worker (1 person): We need to have clean areas, because it is very important for children to be in a good sanitary conditions. — Expected costs for salary: 200 per month
- Watchman (1 person): It is very meaningful to have a sense of safety. — Expected costs for salary: 220 per month.
- Volunteers (as many as possible): We should have a huge amount of people, who want to help us without earning money. It is one of the most significant points of our work.

The total estimated expenses for wages for per month is 3600.

2. Materials for sport classes

   - Rugs(carpets)
   - Balls for football, volleyball and basketball, special fitness balls
   - Dumb-bells
   - Net for volleyball etc, rings for basketball, goals for football

   The total estimated costs for sports equipment is of 2.000

3. Stationery (writing materials)

   - Pens & pencils, markers, rulers, glue, scissors
   - Different kinds of paper (like colored paper)
   - Paints (gouache, water-color and etc.)
   - Plasticine

   The total estimated costs for writing materials is of 1.200

KSIL, the largest Russian company producing playground equipment, is our partner in constructing play parks in Russia. KSIL's ongoing commitment to the Naked Heart Foundation is reflected in the discount we receive on all our play parks. Our partner helps us to design truly inspired play parks that fire children's imaginations, while keeping them physically safe. KSIL has a network of offices throughout the Russian Federation, meaning we are not limited geographically in our selection of new locations.

The budget needed to start operating CS would be of approximately 2.300.000.

7.6.6 Activities

Sport activities : Sport activities and team games are best suited for sociable children or, conversely, the kids who need to develop this trait. Girls can try basketball, handball or volleyball. Professional training usually starts with the age of five. Many boys play football or throw the ball into the basket with pleasure. If one does not have clear priorities among the types of sports, one may start with one of the following: .

- Soccer, basketball & volleyball. We are planning to organize two pitches: the one will be in the inside zone, the second one in the outside zone. Games will be supervised by teachers.
- Physical training (fitness). Fitness training is very popular today. Many parents consider it as an alternative to child development centers. These fitness sessions are for general physical development and strengthening of a child. Children get a beautiful gait, a well-developed speech or even a good hand-writing. A child can engage as soon as it learns to walk confidently.
- Dance. Dance courses will contain simple kinds of dance which should teach children a sense of rhythm. This can improve their state of health, make them more active and ready for study.
- Gymnastic, the *mother of all sports*. Gym classes can be taken by children aged from four years onwards. Experts recommend parents to enroll boldly children to gym classes. After all, this sport develops almost everything: your posture, coordination, muscle, nature, grace, elegance. Girls usually love gym. There are many reasons for it: training of a beautiful body shape and no sharp, angular movements. Flexibility, formed in the gym, remains for a lifetime, giving a girl lightness and grace of her gait.

Mental activities : These can be of the following nature:

- Learning of the history of different nations. It should be in the form of interesting and funny stories. There should not be boring facts or numbers. Rather, children should get initial, basic, fundamental conception of the events.
- Improvement of mental skills. It can be the improvement of the memory or elementary tasks for the development of logic.
- Sciences. This would include for example elementary and upper level of math. Children will learn basics of biology, geography and get ideas about the world of science. Teacher for this subjects have to be profound in the basics of science.

Entertainment activities :

- Games just for fun. There are a lot of games, that can make children laugh and feel happy. It can be something like "catch up", "touch and run", "blind-man's-buff" or guess the riddles.
- Carrousel and similar. Different outdoor entertainment can be installed, e.g. a swing. They can be quite simple or more complex structures in order to address children in different ages.

7.6.7 Marketing and public relation

There are two main target audiences: one is unfavorable families and the other one is state representatives, community organizations, foundations and businesses. For the two target audiences, we need two different *marketing tactics*. Marketing tactic for families includes information in advertising media (TV, radio, newspapers). We need to record audios and video in order to make a model of advertising for the media. We will include full information about our services provided, information about our locations, working time etc. This information shall circulate on the channels which approach for these layers of the population (this will for example exclude advertising on expensive cable channels, on the music channels, on page glossy magazines, on radio stations for young people and subcultures). We will also aim for outdoor advertising, such as advertising through posters in public transportation, bus stops or near public buildings (hospitals, schools and other socially significant facilities).

Marketing tactic for sponsors includes creation of relevant marketing information or creation of a positive image for organizations amongst others.

Finally, through social advertising we will make the need for society to take care of other people a visible and tangible issue, and we will communicate the image of our organization as an helper in the realization of these requirements.

For all this, the following marketing communication channels are proposed:

- The method of *cold calling* telephone calls to a lot of possible sponsors, investors and advertisers.
- Direct mail includes distribution a summary of a business plan with a proposal to become a sponsor or arrange a partnership

This aspect is particularly critical in the case of seeking for sponsors – be it at the beginning, or for ongoing sponsorship – so the next session develops further into this matter.

7.6.8 Plan for searching for investment

Investors are not necessarily only banks but can also comprise of foundations and other organizations which are interested in the success of the project by obtaining various effects (economic, environmental, social, technical, etc.). In any case, investors should be capable of giving some support (direct funding, preferential loans, tax credits, prepaid products, etc.). There are many potential investors, such as a wide range of organizations, companies and individuals, who can be able to provide substantial assistance in the investment of the project. They include:

- Business support funds (concessional loan).
- Business incubators, business centers (providing soft loans and services).
- International funds, projects and programs (loans).
- National, regional or local budget (funding).
- Investment funds (financing).
- Commercial banks (loans).
- Manufacturers of products (own funds).
- Leasing companies (providing equipment leasing).
- Social funds (financing).
- Employment fund (direct, irrevocable funding to create jobs for poorly protected).
- Local authorities (tax breaks).

Some specific cases for the project at hand, to start working with, could be:

- All-Russian Society of the Deaf, Tomsk regional branch.
- ZOV, children's communal organizations.
- Russian Foundation for Charity and Health, Tomsk regional branch.
- Theater Union of Russia, Tomsk regional branch.
- Beehive, the social organization.
- Miracle, an alliance of children's organizations of Tomsk region.

Support does not necessarily have to be financial. It can also be informative for non commercial partnership, or it can be giving some free materials or services. The following would be good potential parters in such sense:

- State Institution and the structure (material support, services, free use of the territory, providing interest-free credit).
- Banks (providing loans without percentages).
- Partner companies that specialize in the manufacture of equipment and structures for playgrounds, construction toys, baby clothes, food, etc. (subject to the partnership).
- Big federal companies with large finance (a company does not pay the taxes if engaged in charity)
- Advertising agencies which can be placed on their promotional areas (media and outdoor advertising) information on the Children's Park (advertising agencies are required to have their space for social advertising

Search for investors requires a huge amount of time and money. To accelerate and facilitate this task, it is expedient to use the services of the various partners to promote the project to investors, such as:

- Business Support Centers (search for investors, support for the promotion of the project).
- Information Centers (providing different information).
- Business Center (search for investors, support the promotion and implementation of the project).
- Consulting firms (consulting).

Searching for investors includes a wide range of different approaches. Usually, investors are looking among their network (partners or their recommendations), surf for information in press and other mass media (advertising potential partners), address books and directories, visit exhibitions, conferences to start their business. We should therefore aim to maintain and enhance our network. We can make use of the items listed below to promote business projects to investors:

- Mass media (radio, television, newspapers and magazines).
- Computer networks and databases.
- Competitions and reviews of investment projects.
- Investment auctions, auctions and tenders.
- Exhibitions and presentations.
- Conferences and seminars.

- E-mailing offers collaboration.
- Personal meetings with potential investors.

Exhibitions, fairs, and presentations are the most convenient place to establish and maintain contacts, obtain the necessary information first-hand, direct negotiations with potential partners and tying personal trust relationships. Unlike advertisements, newspaper articles, brochures, catalogs or computer databases which give only a summary of the investment project, exhibitions or conferences provide information about the investment project, including information about the company, the business plan and provide samples of products. Authors and executors of the project (project team) are usually present at the exhibitions who can provide the most comprehensive information to investors. Some examples would be *Investekspo* on Moscow or *Partners of Progress* in Berlin.

7.6.9 Competitors

Our competitors are centers of development for children and other sections of creativity. These organizations are potential competitors in two cases: they may address the same target audience, or they may address the same investors. In the first case we have a big advantage over our competitors because we have free lessons and we provide material for creative work (for example stationery) sports equipment. For the second type we give way to competitors because this kids park is not a commercial organization. Sponsoring our Children's Park constitutes a charity.

7.6.10 SWOT-analysis

Strong points:

- Strong politics of promotion.
- Particular target audience.
- The support of government for socially significant innovation.
- This project is a solution for actual problems in Russia.
- This project meets the need of society for attention and mercies.

Weak points:

- High cost of equipment and materials.
- The absence of primary capital.

- Low financial profitability of the project.
- Complete dependence on third-party financing.

Opportunities:

- Growth and development of donations in Russia.
- Establishing partnerships with government.
- Increase of the interest in charity from commercial organizations.

Threats:

- The possibility of new competitors.
- Imperfection of legislative base.
- The absence of sponsors and partners at this time.
- The absence of own territory at the present time.

7.6.11 Relationships

Classes with children will be organized similar to classes in school. There are six teachers who will work with children, transfer different skills and knowledge. In the park, there are three different areas of activity: the area of intellectual games, arts and sports. In each zone there are two teachers who have special skills and knowledge.

Every teacher should have a pedagogical education and work experience. The experience is necessary because in our park there will be children from different families, for example from unfavorable families. In this case, the teacher must be able to create a favorable atmosphere for each child. A lot of children will have different levels of education which should also reflects in the program. Teachers are not supposed to give grades. Their job is to provoke interest in the child to work up its interest in the specific fields.

Children involved in intellectual games will solve various tasks, develop logical thinking and mental abilities. Intellectual games help to build positive memories and develop math skills.

The sports zone helps kids to become physically more active, make new friends and have a great time. The trainer will teach some sport games and is responsible for order. Through sports, some competition among children will occur. This is actually a positive effect if guided correctly, as children can get teamwork skills and organizational skills.

Workshops in the creative zone offer children the most popular kind of activities. It may be modeling, drawing or singing. These studies will help them to open their creative potential. This goal is probably the most important in this park, because the main thing is not to teach how to play the game, but help them to realize themselves as a creative person.

7.7 Conclusion and outlook

This project is suitable for the majority of Russian cities, but it can be adapted for other countries as well. We hope that the realization of this project will help to make life better for some children. We think that children will become more creative, organized and happy by our project.

Our general problem will be to find sponsors. In future, we will improve our project, try to find new sponsor, develop our marketing conception, employ specialists who can help us to get new useful contacts and enhance our network. If our project turns to be successful, and we strongly believe that it will, we will think about expansion of this Kid's Park to other cities. We are convinced that every city should have a place where children can feel a friendly atmosphere and release their creativity. We want to see a smile on their faces.

PART III

Closing

Chapter 8

Closing and conclusions

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The previous chapters have shown the results of the creativity of students from the Summer School on Creativity Engineering. The ideas that came out are not short on surprises and creativity, and hold the potential for becoming excellent business solutions.

One interesting reading about this projects is what they constitute in the students minds: they constitute a vision of the future, a grasp of where they see the current world heading... and where they would like to contribute. The most important part when reflecting about this fact is the value proposition of each one of the projects, and the link all of them have with creativity. One can see through this how the students see the importance of creativity in the day-to-day life of society.

And what could be more representative of the future than children? Two of the five projects pointed at them, and most particularly at looking at ways of developing their creativity. Be it as a consultancy service for schools and other associations, or as a physical space where kids exercise their creative potential, the clear issue is that current education lacks – in many countries – of a strong exercise of creative abilities. A physical time and space for children to exercise their creativity through games, and in their free time, is something that has drawn the attention of students as an immediate need.

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But staying only in the realm of children would entail results being visible only in some 10 to 20 years! Two of the groups took an approach oriented to adults, by effecting their working procedures. One of the group focused on the workplace, creating an environment in which companies can benefit of a more creative and sharing environment. Another one of the groups created a platform by which small and medium-sized companies can connect with university students and environments, to get their problems solved giving them a practical application of their knowledge.

Finally, a more direct approach can be taken in the development of a product. And so did another one of the groups, challenging the creative arts in envisaging a new way of making music – or an analogous artistic experience – by devising a way of creating a music track out of vibration. The initial intention is to get deaf people to get to enjoy music, but this project could create a new art form of its own right.

All these projects are the result of three weeks of intense lectures, workshops and hard work on the student's side, and much of that can be seen in the previous chapters. This book is the conclusion of that hard work. Nevertheless, this book is not the end, but rather the beginning. Documenting a project – as has been done here – is the first step to making it happen, to turning it into a reality. It might be too early to speak, but in a few years from now it will be possible to look back and see how much of what is stated in this book comes to happen, be it by the students of the Summer School on Creativity Engineering, or by anybody reading this book and getting inspired by its contents. If you are such a case, please let us know!

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