Degree project

Seeking for obstacles to achieve feasible interventions within NGOs with the use of Participatory Design.

A study in “Network for children’s rights” Greek NGO.

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Abstract

Non Governmental Organizations have a mission to improve the conditions of the whole or a part of the local societies in the place where they are active. “Network for children’s rights” is a Greek NGO that mostly aims to fight for and ensure the appliance of children’s rights as these have been embodied in national and European Union legislation and international treaties. Its employees are working hard to fulfill their everyday tasks and serve the children members. The scope of this study is to seek for major obstacles in order to achieve feasible interventions within NGOs with the use of Participatory Design. PD methodology is considered a fruitful one to engage the employees and other stakeholders who are affected by a problematic situation into the following processes: 1) to co-research the situation inside the working, social, financial and legal context, 2) to express their feelings, opinions, ideas on how the situation can be improved according to their needs, 3) to co-design and evaluate the solution. To fulfill the scope, a PD study in the NCR was conducted. The outcome of the study as well as its whole process were evaluated. Two major obstacles were found. The first and most significant one has been the very small percentage of representation of the stakeholders of the NGO who participated in the study. The second one has been the lack of collaborative language games to ensure mutual understanding among participants. A researcher should pay extra attention to overcome these obstacles and future studies may provide with new tools that confront them.

Keywords: information technology, feasible intervention, Greece, non governmental organization, participation, participatory design

List of Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>HCD</td>
<td>Human Centered Design</td>
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<td>HCI</td>
<td>Human-Computer Interaction</td>
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<td>HDPA</td>
<td>Hellenic Data Protection Authority</td>
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<td>IS</td>
<td>Information System</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>LAN</td>
<td>Local Area Network</td>
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<td>NCR</td>
<td>Network for Children’s Rights</td>
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<td>NGO</td>
<td>Non Governmental Organization</td>
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<td>PC</td>
<td>Personal Computer</td>
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<td>PD</td>
<td>Participatory Design</td>
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<td>WANGO</td>
<td>World Association of Non-Governmental Organizations</td>
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Acknowledgments

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I tried hard working for this assignment to have a “decent” outcome. I wish other researchers will find it somehow useful for them and hope that I will have the opportunity to use this knowledge I gained to make things a little bit better in my country.

Emmanouil
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1. Introduction

In this chapter I briefly describe the social conditions in Greece today, the role of NGOs in general and of the “Network for children’s rights” in particular. Then I talk about examples of problematic IS implementations in the organization and I present the research questions I am attempting to answer in this study.

1.1 Conditions in contemporary Greek society

In the past eight years, continuing economic recession, especially in Greece, and civil or other acts of wars in nearby countries have dramatically changed Greek individuals' and social life. A large number of people have become unemployed. Statistics of the Organization for Economic Cooperation and Development (2017a) show that the unemployment rate of the active labor force in the first quarter of 2017 was up to 22.4%, the highest among the countries inside the Eurozone. Median income since 2010 has been decreased around 35% (Eurostat, 2017a). There are researches who directly correlate economic crisis as a cause to the worsening of the private and social well-being (Economou et al., 2016; Christodoulou et al., 2017; Καρασαββίδου, 2017; Προϊκάκη et al., 2017). Many people have become marginalized or homeless because of poverty and lack of income. The number of suicides from 2009 to 2014 (last data available) has been increased by 55,6% (Organisation for Economic Co-operation and Development, 2017b). From 2009 to 2015 (last data available) health care expenditure has been decreased by 35% (Organisation for Economic Co-operation and Development, 2017c). In 2016 (last data available) the life expectancy at birth has been decreased by 0.3% (Organisation for Economic Co-operation and Development, 2017c). This is the first time that life expectancy is decreased after almost half a century.

Many economic immigrants and refugees from Asian and African countries have come to Greece through eastern land and sea borders. Greece is among those countries of the E.U. that have the highest numbers of illegally present third country nationals. In year 2015 this number was more than 900.000 persons (Eurostat, 2017b), which is equal to the 10% of the Greek population. From 2010-2016 around 64.000 persons from third countries were prohibited to enter the country (Eurostat, 2017c).

According to Amnesty International (2017) 173,450 refugees, asylum-seekers and migrants had arrived in Greece by the end of 2016. More than 434 have been reported dead or missing in the Aegean sea. At the beginning of 2017 around 62,500 of them have been remaining in hot-spots in mainland and on islands (Amnesty International, 2017). Their goal is either to stay and live in Greece or move on to other developed countries of the European Union. However, nowadays most of them stay for a very long period of time in refugee camps or outdoors and many of them are re-directed by the authorities back to their home countries.
In this period of time the Greek state has become unable to confront humanitarian crisis. There is lack of resources to deal with the situation. Greece’s large debt – 180.8% of the Gross Domestic Product at the end of 2016 (Eurostat, 2017d) – and financial adjustment by following the three memorandums of cooperation, signed by the Greek government and European and international lending institutions, have led to a cut off of governmental funding for military and civil security services, health care services and education, and to a decrease of public servants by 35% (Ministry of Administrative Reform and eGovernment, 2017). For this, non-governmental organizations (NGOs) have undertaken to fill the gap government has created in helping and serving citizens and social groups in need.

1.2 The mission of “Network for children’s rights” NGO

“Network for children’s rights” (2016) is an NGO that has as its main goal to protect children’s rights regardless of their origin, race, skin color, age, financial, parental or legal status. It organizes actions regarding food and clothes provisions, health care and education for its children members and their families. It’s funded by E.U. funding programs, other international NGOs it cooperates with, national funding and individuals’ donations. It consists of a very little number of employees and a number of volunteers who help the NCR to operate and perform its actions. There are a lot of tasks going on every day, many of them with the help of Information Technology (use of telecommunications, computers and data networks – local area networks and Internet).

Until today about 1800 children and volunteers have been registered. The number is increasing each year, as more children are willing to enter and get benefited by the NCR, and volunteers are being registered to help the organization to perform its activities. The number of active volunteers vary from time to time, as new volunteers are being registered to help the NCR while others are leaving or becoming inactive because of a number of reasons. The management of children’s and volunteers’ personal information and organization’s activities is carried out with the use of an IT platform that supports mostly the employees and at a smaller degree volunteers. Part of the IT infrastructure is being used by the children also.

1.3 Problematic situations at NCR’s Information System

The current information system has been developed inside the organization to cover its needs. According to the employees, its design and implementation have been done mostly by themselves based upon their own technical knowledge and experience, without the help of any “IT expertise”. The IS does support their basic work needs until today. For example, a couple of employees have created a Microsoft Excel sheet to store, retrieve and manipulate personal and other information about children and volunteers registered in the NCR. They are using this tool for years. However they feel that it is cumbersome, time consuming and that they need somehow to improve the way they fulfill this task.
There is a clear sense that there is space to improve the way tasks are done in terms of decreasing complexity, time, or number of people involved. Another critical factor that needs to be considered in this situation is that because of the economic recession it is very hard for all kinds of organizations, and even more for NGOs that have very limited funding, to hire more employees or extend the IT infrastructure. One possible feasible way to improve the way tasks are done is to reconsider and redesign the routines and the underlying IT infrastructure with the participation of the employees to change them according to their needs and will of how they want to fulfill them.

1.4 Research question of the study

The above example is a case where IS deficiently covers the needs of users. There is an opportunity – beside to the necessity – to help employees reform the way they organize work tasks in order to become easier and less time consuming to accomplish. For the purposes of this study an inquiry of the needs and wishes of the employees to define their requirements about parts of organization's information system that need to be improved was conducted. Special focus was placed on information technology. A co-design of the improvement for a problematic situation that was selected by the employees followed after the inquiry.

For the inquiry and the co-design of the improvement Participatory Design methodology was followed. PD is an approach that engages users into the research and design process which is encountered as “use-before-use”. It is seen as a way to meet the challenge of use the actual design before this takes place in real everyday life (Ehn, 2008, p.92). Current study aspires to create new knowledge in the field of PD. This knowledge is related to the use of the PD methodology in projects regarding NGOs and which are possible obstacles that a researcher may come in front of when he/she does similar studies. The research question attempted to be answered is the following:

**RQ:** “Which major obstacles may come up when doing a Participatory Design study in a Non Governmental Organization?”

1.5 Structure of paper

In order to answer the research question of the study the structure below was followed:

- **Literature Review:** an overview of researches regarding IS, IS implementation failures, the innovative characteristics of PD and PD applications in NGOs.
- **Topic Justification – Description of case:** scope of this study, analysis of its motivations and a brief description of NCR in relation to the PD study that took place there.
- **Research Methodology – Participatory Design:** an analysis of PD in terms of history, characteristics and fruitfulness for this study.
• **Research Paradigm:**
  the philosophical underpinning upon which the study was based.

• **Methods:**
  description of the methods chosen for data collection and analysis.

• **Ethical considerations:**
  an overview of PD’s value-centered approach and of the issues that had to be addressed regarding the ethical stance of the researcher.

• **Data analysis:**
  outcomes of the methods applied and analysis of the data collected that concluded to which problematic situation NCR’s employees decided to work on and co-design an improvement.

• **Design:**
  description of the co-design of a prototype application to improve the above chosen problematic situation.

• **Discussion:**
  evaluation of the prototype application and of the conduct of the study following the PD methodology, critical reflections about the whole process and the answer of the research question.

• **Conclusions:**
  a sum up about this study and possible further researches that can be based on it.
2. Literature review

In this chapter I cite what researchers and authors have written about issues that are directly relevant with this study. I start with a view of how important IT is in contemporary organizations. I present cases where IS failed to increase productivity as well as IS projects that even failed to be implemented completely. I continue with an introduction to the approach of bringing human to the center of the research and design processes and I conclude with the application of Participatory Design methodology in projects for non governmental organizations specifically.

2.1 Information Technology use in contemporary organizations

Modern information technology has a great impact on spheres of contemporary human activity and plays an important role in the work of non-governmental organizations and international human rights community in general. From the early 90's the U.S. started a nation-wide initiative to develop a national information infrastructure to support governmental and non-governmental organizations, soon followed by Europe (Peslak, 2006). New technologies have been proliferated from business sectors and organizations to governmental organizations at a country level and continue to do so (Walsham, 2012, p.88).

IT differs from preexisting technologies in four major ways: 'speed, cost, scope and interactivity'. Metzl (1996, p.710) argues that information through electronic media has a positive impact on productivity, by making it available quickly and cheaply, and individuals can have remote access to it almost immediately with the use of data networks, but only when this is simple and uncomplicated. Following the dramatic changes in the Information Systems field, Walsham (2012) is wondering whether IT professionals' work is making the world better. In his approach of addressing this question, besides the discussion about basic definitions like what the words “better” and “world” mean to us, he strongly supports that an ethical agenda in the IS field is of high importance.

For over two decades, Information Technology has become ubiquitous in the majority of people's personal and work lives (Walsham, 2012, p.88). In everyday work there are procedures that are critical and others that are important but of a lower value. There is a need to reduce the second ones so as to maximize productivity. IT can help employees to improve their productivity and work experience by reducing or eliminating non productive activities and to perform their tasks more efficiently. It provides potential tools to assist employees perform certain non-value-adding routines faster and to increase productivity impacts (Palvalin et al., 2013, p.546).

2.2 Information Systems implementation failures

Failure rate of the implementation of information systems over the last 30 years is worryingly high, at around 70% (Drummond, 2005; Doherty et al., 2011). However, organizations worldwide keep investing in information technology to support their
operations at an increasing rate. Cobb (1996, cited in Cecez-Kecmanovic et al., 2014, p.562) as well as Doherty et al. (2011) argue that despite the accumulation of knowledge all these years no difference has been made towards decreasing the rate of failure in IS practices, while Lyytinen & Robey (1999, p.86) state that there are researchers who argue that organizations are entrapped into cycles which can only be improved by learning from the past experience.

Yeo (2002, p.243) distinguishes projects that have failed into two categories. The first one is called “challenged” projects. It includes projects that, though they have been completed and they are operational, they offered less features than those they were designed to offer, they exceeded the budget and/or they caused program slips. The other one is called “impaired” projects. It includes all those projects that were never completed but were abandoned in some point of the development process. Trying to understand the reasons why IS projects fail, we find many studies which support that failure roots less in technical factors and more in social and organizational ones (Fitzgerald & Russo, 2005 cited in Pan et al., 2008, p.260).

In literature we find an approach which supports that the success of an IS implementation cannot be assessed with an objectively correct account because the outcome is always depended on different, sometimes conflicting, views of the stakeholders who are motivated by their own organizational, social and political interpretations. There are cases where the users considered the IS implementation as a success but the managers considered it as a failure (Cecez-Kecmanovic et al., 2014, p.563). Sometimes IS implementation does not meet the requirements specified during the design process. There are many cases where, although requirements were met, the acceptance of the system went beyond the quality factor and was denied due to cultural or social in nature issues (Yeo, 2002, p.241). Other factors of failure that Pan et al. (2008, p.260) underline are uncooperative users, weak managers, lack of resources and unrealistic expectations.

2.3 Does the use of IT always increase productivity?

Grüner (2009, p.918) states that new communication devices as well as new software products that are more comfortable, like modern word processors or other statistical applications, lead to productivity increase. The introduction of new IT tools provides means to process information in shorter time, and face and solve problems without excessive delay. This fact combined with a relevant restructure of the organization generates a surplus of employees, as less employees deal with the problems in less time. In other words, employees work more efficiently for the same amount of time. Small changes in communication technology may impact on a partial restructuring of the organization. On the other hand, being reluctant to reform the structure may yield to minimal improvements of productivity (Grüner, 2009, p.919).

Besides IT, there are other factors that are crucial to achieve increased overall productivity. These are human skills, knowledge sharing and workplace organization (Blok et al., 2012, p.2605). Provision of flexible work arrangements implies offering
the employees more freedom and self control on their work. These have often been referred as the “New Ways of Working (NWW)” and have been addressed as of great importance to improve efficient working. Loukis et al. (2009, p.194) point out that there is a significant increase of the IT investment when combined with a complementary ‘co-investment’ in leveraging human skills and reorganizing organizational practices. There are findings which underline that investing in IT human resources and skills also increases by an average of two thirds the business value compared to an investment only on hardware, software and networking.

Another aspect of the situation is the way employees, as computer users, use IT tools to carry out their work. There are millions of end users who are using software like spreadsheet applications to perform tasks but they lack the programming knowledge to create automated procedures. Gulwani et al. (2012, p.97) argue that business end users who use these kind of software are mostly not professional programmers but they have thousands other diverse professional backgrounds. They only need to create small, “often one-off”, procedures to automate business tasks. Spreadsheet applications, like Microsoft Excel, have provided a great number of features, like string and numeral functions or macros, to accomplish tasks. Despite that, end users are found to struggle trying to find the correct features that are fruitful to them (Gulwani et al., 2012, p.97).

Edberg and Bowman (1996) conducted an analysis on quality and productivity measures regarding computer applications developed by computer end user vs. surrogate IS professionals. In their study, they examined the validity of the hypothesis that end users might be more productive when they develop applications for computer use compared to surrogate IS professionals because they know exactly their needs and requirements. Empirical evidence showed that end users spent a considerable amount of time on this activity with very low quality outcomes. There are many possible explanations for this. The lack of applications development training, and insufficient, bad quality or lack of proper documentation are some of them.

2.4 Giving humans “a voice” in the design process

From the early 70’s there were projects in Scandinavia that started to spread progressive ideas from the society to developing computer systems in various workplaces. This created a heritage that led to later participatory approaches and – after more than four decades of growth – to Participatory Design. PD was based on a political context where there was a try to involve citizens or larger community groups in an effort to research and solve problematic situations that directly concerned them. Until the early 80’s management principles were strongly influencing and controlling the flow of the design process. At that time, a new approach called Human-Computer Interaction, that focused on how the ‘user’ could influence the design process, started to emerge (Kensing and Greenbaum, 2012, p.23).

Since then, a number of traditions that try to forward some form of ‘user empowerment’ have emerged. Some examples are user-driven innovation, user-centered design and contextual design (Kensing and Greenbaum, 2012, p.27). Cornwall
(2003) argues that participatory approaches can give a voice to the least powerful and marginalized groups of people. Over the last 20 to 30 years we have seen a rapid growth on the Participatory Design field (Sanders et al., 2010, p.195). According to Carroll and Rosson (2007, p.244) those who are going to ‘use’ whatever is going to change the current situation are morally entitled to have a voice about the changes since they are the ones who very well know what is precious and what is annoying in this situation.

PD has a tradition in a number of projects concerning the design of IS in local level communities (towns, villages), non-profit communities and non-governmental organizations (Carroll and Rosson, 2007, p.258). It differentiates itself from the other participating approaches mentioned above (user-driven innovation, user-centered design, contextual design) for it does not solely try to engage users as informants but for it has a strong emancipatory effect for them through its process (Kensing and Greenbaum, 2012, p.27). It most centrally includes the users that are directly affected by the design artifact. Along with them it tries to engage co-workers, managers, customers and other stakeholders who may be indirectly affected. This turns the designer’s role to become more complex and nuanced (Carroll and Rosson, 2007, p.243).

Löwgren and Stolterman (2004, p.33) describe the design process as a social one. They introduce the circles of involvement, a structure consisted of three circles, to depict the involvement of the stakeholders in the design. In first circle, which is called core, there are the design professionals together with the users and stakeholders who are directly involved in the design. In the second circle, which is called periphery, there are all the other users or stakeholders who do not actively participate in the process but are affected by it. In the third circle, which is called context, we find the close environment and society that indirectly and in complex ways affect the design.

![Figure 2.1 The three circles of involvement (Löwgren and Stolterman, 2004, p.33)](image)

PD has in its core an ethical motivation to help the people who are engaged to collaborate with others so as to shape their world. This motivation is a commitment PD cannot exist without. It has also a human dimension because it engages the people who
form the community being inquired in the process (Luck, 2003, p.523). It supports people to work together to shape a better future (Robertson and Wagner, 2012, p.65). PD has principles which guide the designers and participants towards this: it aims to equalize power relations among the stakeholders, to democratize practices in the workplace, to forward mutual learning among the participants, to provide them alternative technological visions and to enable them take decisions about the design that will directly affect them based on their personal values (Robertson and Wagner, 2012; van der Velden and Mörtberg, 2015).

2.5 PD applications in non governmental organizations

In academic literature we find several cases where participatory methods or techniques have been used in projects for NGOs around the world. Some of them concern internal managerial or organizational issues of the organizations. Others concern their tries to improve their interaction with humans and institutions within the social and political context they operate in. Jamal et al. (2014, p.14) cite a number of authors (Sen, 1999; Bradley, 2006; Banerjee, 2007; Mohan, 2008) who argue that participatory approaches are more sustainable and effective for development projects in NGOs than expert-driven solutions.

Jonathan Pugh (2003) has worked with NGOs in the Caribbean on participatory planning on issues regarding e.g. community empowerment, inner-city and tourism development, or gender and development. Butler et al. (2008) write about a project that aimed to design a core IT artifact for an NGO’s Knowledge Management System with a focus on the participation of the people of the organization. During the year 2003-2009 a big-scale research took place in Sweden. NGOs set out to design a strategy for alcohol and drug prevention. The researchers, among others, widely used participation methods like interviews and participatory observations (Geidne and Eriksson, 2009; Eriksson et al., 2011).

Mike Kesby (2000) with two of his postgraduate students at the university of St. Andrews contacted a research using participatory methods in rural Zimbabwe. Their goal was to gain insights into the ways a small AIDS/HIV NGO, Tsungirira, communicated knowledge about sexual health with different local groups of people. Kelsall and Mercer (2003) researched the effort of World Vision NGO to empower local communities in Tanzania. The research focused around two axis of tension. The first one was how the try of empowering a community could disempower individuals or groups within it. The second one was the paradox that external agents were necessary to cultivate into individuals and communities the desire for autonomy.

Even if there are authors who recommend that the NGOs should adopt participatory methodologies to have benefits for the success of the projects, there are others who describe cases where NGOs did not manage to successfully apply participatory approaches. Manyozo (2002) explains how a development project for producing theater together with local communities carried out by NGOs in Malawi failed. One of the
main reasons had been the insufficient participation of the local people that resulted in misinterpretation of their culture.

Tsiga et al. (2016) reflect on a case study of one international NGO (that requested anonymity) in Zimbabwe which conducted a development project with lack of “real participation” of the community. Mansuri and Rao (2013) articulate about NGOs that have even become barriers in development participatory projects run by the World Bank in many countries worldwide. Jamal et al. (2014, p.14) support that, even if participatory approaches provide sustainability and effectiveness, the adoption of a mixture with other kinds of approaches may bring participation to an optimal level.
3. Topic Justification – Description of case

In this chapter I argue about the scope of this study. I refer to the factors that motivated me to use Participatory Design within NGOs and carry out this study at “Network for children’s rights”. I give more details about the social conditions under which NCR operates, I describe its structure, the kind of involvement of its stakeholders and the limitations in the study known from the beginning.

3.1 Scope of the study

Current study aspires to contribute to the knowledge in the specific field of PD appliance within the workplace of NGOs. It aims at seeking for and bringing to the surface major obstacles that may come up while doing PD study to improve problematic situations within NGOs themselves. In order to fulfill this scope a PD study was conducted in the NCR. The outcome of this study as well as the study itself were evaluated. The first was evaluated to decide whether the outcome has been feasible or not and the latter to conclude to which were the major barriers that came up and brought up difficulties in conducting successfully the methodology and achieve this feasible intervention.

3.2 Motivation

Selection of the research topic was based on the limited research in the specific area of interest. Looking at the literature we find projects for or by NGOs that participatory methods have been applied with success as well as other projects that have failed because those kinds of methods had not been applied correctly or not at all (see section 2.5 PD applications in non governmental organizations). However we find limited cases with the following two elements: 1. projects where PD methodology has been followed explicitly, even if we read about the appliance of some participatory methods, 2. projects which aim to intervene directly in the way employees inside NGOs are fulfilling their task so as to help them do their work better.

3.2.1 The choice of PD methodology

Participatory Design was chosen because it provides tools and techniques to engage stakeholders to participate in all stages and to promote the viewpoints, knowledge, skills and values of the people who are going to use or to be affected by the outcome of the process (van der Velden and Mörtberg, 2015, p.57). Participatory methods have been found to lead to sustainable and efficient solutions (Jamal et al., 2014, p.14). Participative and engaging design approaches may focus on everyday tasks and concerns of people’s lives. Non-governmental organizations are main actors in them (Ehn et al., 2014, p.2). PD is broadening its action in public spaces. This new situation is an invitation for researchers and practitioners to re-conceptualize the form of invention as a design and innovation approach. Now collaborative prototyping and local knowledge exploitation are taking place as “design in use, not design before use” (Ehn et al., 2014, p.7).
There are times when networks of people who share the same values are needed to make changes (Björgvinsson and Severson, 2014, p.181). Those who are engaged in NGOs share same values as NGOs themselves are concerned about social innovation (Emilson, 2014, p.25). The methods – interview, future workshop and prototyping – that were chosen to be applied were considered fruitful to put people of the NCR in the center of the research and design processes, and to collaborate to develop feasible interventions that will make their work easier according to their needs and will. A detailed presentation of the methodology and methods is given in chapters 4. Research Methodology: Participatory Design and 6. Methods.

3.2.2 Differences of NGOs in comparison to the other kinds of organizations

In this section the major characteristics that differentiate NGOs from the other kinds of organizations are presented to justify why specific studies for PD appliance within them need to be conducted.

3.2.2.1 Legal status and scope of existence

According to World Association of Non-Governmental Organizations (WANGO, 2005) NGOs are non-profit organizations. Their operation is intended to generate no financial profit for its employees or other individuals other than a reasonable compensation for the service they provide (p.11). They cannot be part of governmental or intergovernmental agencies (p.12). They are not part of the business sector either. Lewis (2006) addresses the issue of relations between NGOs and governments or business sector (market) and he identifies the first as of different type of organization from the others. In literature we find authors who classify them in the “third-sector” (Anheier and Seibel, 1990; Lewis, 1999; Brandsen et al., 2005; Lewis, 2006; Teegen at al., 2011) or in the non-profit sector (Salomon, 1994; Henderson, 2002; Serra et al., 2011; Teegen et al., 2011).

Their formation is based on private initiatives which are motivated by the voluntary values to “pursue a shared interest or concern” (WANGO, 2005, p.15). Most of them provide services and help to marginalized groups of people in terms of sheltering, feeding, clothing, educating and providing health and legal support. Their mission activities must be clearly documented and be consistent with local laws and regulations (WANGO, 2005, p.15). It differs from the ones of for-profit organizations which are formed mainly to generate profit for their stakeholders competing other for-profit organizations. It also differs from the ones of the public sector organizations which are formed to provide state’s services to the public.

Operation of governmental and non-governemental organizations can be complementary to each other since the latter come to feel the gap that the first leave in servicing the public (Bryson, 1988, p.78). Kamat (2004, p.164) points out that NGOs come to provide services in sectors where the state is incapable to do so and which are not profitable for private investors. There are occasions when NGOs have come into
direct opposition with governmental agencies in cases of conflicted goals (Kamat, 2004, p.161).

3.2.2.2 Structure and Finance

The administrative structure of an NGO is similar to other organizations. It is consisted of a governance body (administrative board) and departments like public relations dept., accountant dept., human resources dept. etc. A difference between an NGO and other kinds of organizations is that its governance body offers voluntarily its services to the organization without payment (WANGO, 2005, p.15). The most important structural and operational difference is that its operation is critically based on volunteers (WANGO, 2005, p.15) (see next section 3.2.2.3 Volunteers for details).

NGOs ensure their finance mostly from fundings, fundraisings and donations. Financial support comes from many sources, from governmental agencies, international institutions and private sector companies to individual donors (WANGO, 2005, p.42). Their financial status depends exclusively on outside sources in contrast with for-profit companies whose main finance income is based on the profit they make from products or services they provide and with the governmental organizations which are funded from taxes set and collected by the central government (Bryson, 1988, p.78). Most of an NGO’s expenditure should be directed to organization’s programs and services to the target group. The ideal percentage is 80% to programs and 20% for organization’s own operation costs (WANGO, 2005, p.18).

3.2.2.3 Volunteers

The biggest difference between NGOs and other kinds of organizations is that their operation is vitally based on volunteers. A part of their personnel is full-time or part-time employees who are paid for their services and the rest is consisted of volunteers who are willingly provide their services to the organization for free. Volunteers may belong to the target group of the NGO or may be supporters who share the same vision with the NGO (WANGO, 2005, p.15). They can be used in many roles. They can help in organization’s activities and services as well as in management (WANGO, 2005, p.30). They can be either highly trained professionals appointed to special activities or non specialists who just help in tasks.

In most of the cases volunteers participate in a training program to help them be productive in the tasks they undertake (WANGO, 2005, p.31). This creates an additional cost for NGOs and explains why larger ones tend to minimize the use of volunteers (Lyons, 2001 in Fahey, 2003, p.16). Their recruitment and active engagement is hard because they require kinds of resources (funds, time and staff) that are almost always limited (Martinez and McMullin, 2004 ,p. 113). Peng (2009, p.28) points out that NGOs’ development depends upon volunteers for they are important and play a special role in them.
They are working in during their free time. They don’t have a professional relation with the organization. They are not committed to it with some kind of legal contract and they are free to leave the organization any time they want. As volunteers mostly seek for short recurrent experiences, it is very difficult to manage a high level of commitment (Fahey, 2003, p.15). This instability of their relation to NGOs is a critical factor for their operation since they (volunteers) are vital for them. This characteristic critically differentiates NGOs form all other kinds of organizations or companies that do not base their operation on volunteers and justifies a closer study about doing Participatory Design especially for them. In section 10.2.2 Criterion #2: Collaborative development the impact of the existence of volunteers in this particular study is explicitly discussed.

| Scope of existence | - Serve the community based on humanitarian values.  
| | - Help marginalized groups of people (shelter, food, clothes etc.)  
| | - “Pursue a shared interest or concern”.  
| Income | Non-profit.  
| Staffing | Fundings, fundraisings and donations.  
| Partly from paid employees, partly from volunteers. Percentage for each part varies for each organization.  

Table 3.1 Main characteristics that differentiate NGO’s from other kinds of organizations.

3.3 Description of case

3.3.1 Current social conditions

During the time of the study we were going on through the eighth year of continuous economic recession in Greece. This economic crisis has affected many countries in the E.U. but in Greece the problem appears to have the greatest impact among all E.U. countries because of the preexisted national, political and financial limitations. These conditions have resulted a great number of civilians to become unemployed, to start living under poverty status, to have limited or no access to health and education services and to become marginalized (Organisation for Economic Co-operation and Development, 2017a; 2017b; 2017c).

Around 2,25 million citizens are at the risk of falling under the limit of poverty (Eurostat, 2017e). Problems in social life have increased problems in personal and family life too (Economou et al., 2016; Christodoulou et al., 2017; Καροσοββίδου, 2017; Προϊκάκη et al., 2017). According to the latest report summary of the Greek National Committee of UNICEF (2017, p.4) about the situation of children in Greece we read that at the end of 2015 (latest data available) 45% of the children cannot cover 3 or more of their basic needs. In the same summary we read that 38% of the children are leaving in conditions of poverty and social exclusion, and 26,6% of the children are literally leaving under the limit of poverty (Greek National Committee of UNICEF, 2017, p.15).
Greece is, unfortunately, in the center of an area that is militarily unstable. In the Near East and the Northern African countries a number of civil wars takes place. In the Balkans, new areas of possible war acts come to the fore. Another issue that has a great impact in social and economic life is the thousands of refugees who are leaving their countries to save themselves from war or to seek for better living conditions in European countries (for details see section 1.1 Conditions in contemporary Greek society). The last couple of years, all refugees and immigrants have ‘stuck’ and live in refugee camps in several places in Greece and cannot move to other countries (Amnesty International, 2017).

We experience an increase in numbers of suicides and divorces (Economou et al., 2016; Christodoulou et al., 2017), a decrease in new-born children (Προϊκάκη et al., 2017), massive emigration of Greeks – from 2009 to 2015 (last data available) emigration has been increased by 110% (Eurostat, 2017f) – and internal social conflicts and small scale riots in the places where refugee camps are placed (Amnesty International, 2017). The increase in the number of the poor people does not only bring individual misery but an increase in death and decease rates, in criminality (Economou et al., 2016; Christodoulou et al., 2017) and in the numbers of protests and riots also.

The national political and economic strategy that has been followed the last years hasn't managed to change these social conditions much until the end of 2017. NGO’s are institutions which come to provide people with goods or services and support the central government in this (WANGO, 2005, p.15). NCR is one of them. As stated before it aims mostly at helping children and their parents without any discrimination regarding age, gender, race, parental and legal status.

3.3.2 Presentation of the Network for Children’s Rights

NCR started forming back in 2000. It was officially founded in 2005. Its main goals are to help, inform or organize activities and campaigns about issues such as the enforcement of international conventions about children’s rights, information about institutions that protect those rights, support of families in poverty, protection against child labor, bullying, abuse, exploitation and other acts that put in danger the physical or mental health of children (for details see Appendix C – Detailed Presentation of NCR’s structure).

NCR is governed by an administrative board of eight persons and one general manager who coordinates its employees and volunteers. The number of the employees varies from time to time. There are about twelve permanent employees and a number of others who are employed for certain periods of time according to the needs of the organization each time. Four employees act as coordinators of the programs that NCR runs. They are responsible for registering children and volunteers in the organization, coordinating volunteers, and organizing and supervising activities for the children.

The rest of the employees deal with tasks concerning financial management, fundraising, public relations and other administrative tasks that do not have to do
directly with children members. Employees such as doctors, social workers or lawyers who support certain activities of the organization are employed for fixed periods of time. The operation of the NCR is highly depended on volunteers. They are people who are registered in the organization to help mostly in humanitarian, educational and entertaining activities and less in administrative tasks.

The departments that are responsible for programs the organization runs for children are internally called “structures”. There are four “structures” (Figure 3.1). The first three are housed in buildings in the center of Athens: 1) the Culture Lab, 2) the Child Center and 3) the Network at Triber. The fourth structure has to do with activities for refugee children that take place in refugee camps around the city of Athens. The Culture Lab is the oldest structure and it houses most of the administrative tasks of the organization. The Child Center is mostly the place where children and their parents take health advisory services. In all structures educational, entertaining and informational activities take place.

NCR has no specific predefined IS strategy. The IT infrastructure is developed partially in an attempt to cover the needs of organization’s operation as they appear. Each building has a local area network that is connected to the Internet, fixed line telephones, several computers that employees, volunteers and children members use and peripheral devices such as printers, and photographic and video cameras. There is no special software to use. The software that is used is mostly Internet browsers and Microsoft Office suit. For a detailed presentation of NCR’s structure see Appendix C – Detailed Presentation of NCR’s structure.

3.3.3 NCR’s circles of involvement

In section 2.4 Giving humans “a voice” in the design process we saw that the design of interventions is a social process where all the stakeholders of the organization under study are placed in one of the circles of involvement (see Figure 2.1 The three circles of involvement) based on how they affect and are affected by it. As described in details in the next section, for the scope of this study research and design to help its employees to make interventions for a better workplace by applying the PD methodology were conducted. Which stakeholders of the organization are placed in each circle is presented here:
• Core
Besides the researcher, employees and volunteers are in the core of the research and design process. They are the people who are working in the organization. In the previous section we saw that there are groups of employees who are dealing with different kinds of tasks like administration, coordination, finance etc. Volunteers mostly help in the organization and the execution of the activities. The higher scope of all their actions is to fulfill NCR’s goals as these are described in Appendix C – Detailed presentation of NCR’s structure. These are the stakeholders who are directly affected by this study and they should be genuinely engaged into the design of the changes of their workplace to make it better for them.

• Periphery
In periphery the children members and their parents are placed as they are the people who are benefited by the services of the NCR. They are indirectly affected by the design outcome of the study. If the workplace gets better for the employees and volunteers there will be subsequently more resources of the NCR available for the service of the members and their parents. These resources maybe more people or time available for activities regarding children instead of administrative tasks.

• Context
In this circle people and institutions outside the organization, and social conditions the organization operates under may be placed. In section 3.2.1 Current social conditions we saw a presentation of the social conditions. Examples of people who can be placed in this circle are friends and relatives of children and their parents, and people with whom they have professional or social relations. Examples of institutions that can be potentially affected by this study are the schools of the children, municipalities, other NGOs and private organizations NCR is cooperating with, and local communities of citizens, refugees or immigrants. Here the legal context under which the organization operates is placed also.

3.3.4 Limitations

As stated before, participation of people who are to be directly or indirectly affected by the outcome is of high value in PD. However from the beginning of this study it was clear that certain groups would not participate in the study as well as other were to be seen if they would participate or not. No member of the administrative board stated available to take part in this research. The reason is that, because all members have primarily other professions to make a living, their engagement in NCR’s operation is already part of their spare time. So from the beginning it was clear that, even if they welcomed and approved this research conduct, they were unwilling to participate in.

Before the start of the study, it was agreed by the employees, I was in contact with, and by me that no children under the age of 18 would participate in the research also. This was done because of the special conditions of consent that are required by the Greek law for their participation to be legitimate. The extra consent and the presence of an adult custodian was considered to add much more complication on scheduling meeting
and as a factor that would increase the possibilities of meeting cancellations, for example because of children’s or escorts’ unexpected obligations.

The NCR is highly dependent on volunteers to perform most of its activities. The number of the volunteers is varying from time to time and also there is frequent change of the individuals who perform the same tasks. The time volunteers spend in the NCR is relevant to other obligations they have, e.g. their profession or attendance in a university. In some cases volunteers who are unemployed find a job and leave. Others may leave the city of Athens. These facts create a situation where the individuals who voluntarily work at the NCR change very often and it was difficult to find some who could certainly participate during the whole period of the research.

So, from the beginning of the study it was clear that three groups of NCR's stakeholders would likely (volunteers) or surely (administrative board – children members) not participate in the study. This was a serious barrier for the application of the PD methodology since participation of the people involved in the case under study is a core element. These limitations are discussed in details in section 10.2.2 Criterion#2: Collaborative Development. Of course, other obstacles came up during the study also, but those mentioned before were already known before the start of this study.
4. Research Methodology: Participatory Design

In this chapter I give details about the Participatory Design methodology I chose to conduct the study. First I give an overview about the discussion between researchers whether or not PD can be considered as a methodology. I take an affirmative stance in this debate and I explain the reasons. I describe the core elements of PD and I refer to critiques against its effectiveness and to examples of projects where it failed to be implemented successfully. I conclude with the main points of my stance.

For the scope of this study, participants ought to be brought to the front of the inquiry and design processes (see sections 3.1 Scopes of the study and 3.2.1 The choice of PD methodology). To do this, Participatory Design has been considered as the most fruitful approach. This is, among others, because PD's scope is the design of ITs and systems that are enabled by technology and it is motivated by the aim and the context of providing people with better tools at their workplace for purposes like the automation of repetitive and tedious tasks, while this can eventually enable them to extend their skills (Simonsen and Robertson, 2012, p.2).

4.1 PD: approach or methodology?

One part of PD's tradition is originated in Northern Europe and especially in Scandinavia. It roots in 60's and 70's democracy movement and it intends to put those whose work practices are going to be affected by the technological changes to the center of the design process. The original focus was to democratize the working life with a range of projects that afterwards influenced PD. At these projects the objective was to involve workers into the design process (van der Velden and Mörtberg, 2015, p.42).

At the heart of PD’s tradition it is the commitment that those who are going to use the IT artifacts that are to be designed play a critical role in the process. It comes from the origin to forward democracy and autonomy in the workplace and enhances task variety and skills of workers. Among its aims is to provide workers with better tools to fulfill their daily tasks and enable them extend their skills (Simonsen and Robertson, 2012, p.2). Users, through their participation and by sharing their knowledge about organizational and work tasks, directly influence the design process (Pilemalm and Timpka, 2008, p.328).

In academic literature PD is not always stated, or at least fully accepted, as a methodology of research. It is worth mentioning that there are authors who avoid to refer to PD as a methodology. For example, Kensing and Blomberg (1998, p.167) refer to PD as “a maturing area of research and an evolving practice among design professionals”. Luck, (2003, p.523) characterizes PD as a research field also. Carroll and Rosson, (2007, p.243) characterize PD as a design paradigm and as a professional practice to develop IS and applications.
On the other hand, Bratteteig et al., (2012) argue that PD “...should be interpreted broadly as a ‘methodology’ ”. van der Velden and Mörtberg (2015, p.41) write about PD as a design methodology also, where future users are co-designers in the process. Spinuzzi (2005, p.163) clearly states that, even if a loose one, PD can be defined as a methodology. He argues that if we wouldn’t consider it a methodology we wouldn’t be able to “hold ourselves accountable to participatory design or build on a coherent body of knowledge”. Going one step further, Simonsen and Robertson (2012, p.2) describe PD as a research discipline. Spinuzzi’s (2005, p.163) view about PD reflects exactly the way PD is considered in this paper: “[…] participatory design has its own highly articulated methodological orientation, methods and techniques […].”

4.2 Why Participatory Design

PD stance had always been to enable human action and people's participation in the way their work practices are shaped (Simonsen and Robertson, 2012, p.2). When people are engaged, they become an active part of the discussion, decision making and design process (Luck, 2003, p.524). The effort to enable the participation of those who are going to be affected by the outcomes of the design has led to a development of a diverse set of principles and practices. The essence of PD can be defined as:

“a process of investigating, understanding, reflecting upon, establishing, developing and supporting mutual learning between multiple participants in collective ‘reflection-in-action’. The participants typically undertake the two principle roles of users and designers, where the designers strive to learn the realities of the users' situation while the users strive to articulate their desired aims and learn appropriate technological means to obtain them.”

(Simonsen and Robertson, 2012, p.2)

According to this definition there are two principle roles: users and designers. It is not easy to define the two roles in PD, as these blur as much in who is user and who is designer as in the gap between use and design. We could distinct the roles at least at the early start of the design, defining designers as those professionals who are responsible for the information technology design and users as those who are going to get benefited by the technological solution (Simonsen and Robertson, 2012, pp.2-3). Designers should act a facilitators to motivate and help users to express themselves (Chambers, 1994).

Bratteteig et al. (2012, p.139) argue that PD process addresses an area in which no participant normally knows everything: the designer knows about technical issues and design processes, while the user knows the domain and use context, i.e. the activities and practices into which the new technology will be introduced. According to Beazley and Ennew (2006, p.192) the philosophical principles participatory research is based upon lead to the following ideological assertions:

“• people should be active agents in their own lives;
Two fundamental aspects make PD extremely fruitful to use in the current research too. The first aspect is that, during the design process, it gives voice to those who are going to use the outcome. Carroll and Rosson (2007, p.243) argue that there are two proposition in Participatory Design. The first is the moral one which states that the people who will ultimately affected by the design outcome ought to have a voice about it. The second is the pragmatic one and states that people who are going to adopt the design outcome should be included in the design process so as to offer their experience and perspective about it. This is done without the need to have professional knowledge in technology design.

PD aims to actively involve users in the analysis as active subjects, and the analysis becomes not only a joint activity of understanding the contextual conditions for the design, but also an activity of exploring opportunities for change (Bratteteig et al., 2012, p.135). David Hulmes (1994, p.252) points out that a development improvement cannot be sufficient in any other case than the one when “researchers explicitly attempt to link knowledge to action by analyzing the implications of the knowledge they create for the actors involved in the practice of development”. In this study, the active engagement of the employees in all possible stages of the process was necessary. It was very much desired that they would have a voice and cooperate with the researcher to define, understand and find a solution to improve problematic situations.

The second aspect is that the absence of professional knowledge in technology design limits the ability of the users to define all possible options for the outcomes and decide. This is confronted by the process of mutual learning. Users and designers both inform each other about the requirements of the solution and the capacities of technology to come to it. The researcher is the professional who possesses the knowledge about technology, its capabilities and potential applications that could help employees in their tasks. This knowledge is to be shared with the other participants to help them think of, envision and propose suitable solutions.

4.3 Core elements of PD

The core of PD is participation. Bødker et al. (2004, p.58) have labeled the efforts in the field to study, understand, support and apply design as “genuine user participation”. It is the transcendence of users' role from those who only give information about the situation to those who willingly and actively participate in the design and contribute to a shared agreed outcome. This improves products' and services' quality because the resulting technology works better at workplaces and leverages human activities. PD, in its first instance, allowed people to change and develop the way they were doing their work by the design of information systems that
would embody both improved working conditions and computer technology. New
design methods and techniques were developed to enable all those who were engaged
in the design process to visualize a new future consistent with this engagement. The use
of these methods increases communication and mutual understanding between all
stakeholders (Simonsen and Robertson, 2012, p.6).

A second core element of PD, that has already been stated before, is mutual learning.
This is an ongoing activity throughout the whole process. Users need to get in touch
with the technological solutions that could potentially help them improve their work
practices. Designers are the professional experts who possess this kind of knowledge
and will share it with the users to support their active and efficient involvement. On the
other hand, users have the knowledge of practice, conditions and needs of the situation
under study and they will share it with the designers, so as all of them will be enabled
to come to feasible and sustainable solutions (Simonsen and Robertson, 2012, p.2). As
mentioned before, employees would help the researcher to gain an in-depth insight of
problematic situations. On the other hand, the researcher would share his knowledge of
technology and design with the employees to offer them much more tools to decide
what to propose.

A third core element of PD is practice. It refers to the context in which the technology
is going to be used. Very often, what people do is different from the way this has been
described or depicted by themselves or by others. PD is committed to the inquiry and
understanding of practice so as to inform design how technology should be used and
should shape every day activities at work (Simonsen and Robertson, 2012, p.7). Practice
is in general a more of a social rather than an individual activity; as a
consequence it is promoting a cooperative support of all participants to the design
process. A fourth and last core element is the design process itself. PD considers both
the final technological outcome and the process of design, the 'how', that lead to the
outcome. A variety of design methods have been developed that enable the participants
to visualize and experiment on aspects of technology and to reflect and propose
throughout the whole process. The iterative cycle of experimenting and evaluating is
the essence of PD (Simonsen and Robertson, 2012, p.9).

4.4 Criticism and failures

PD approaches have been set under criticism. Already from the early 80’s they have
been found to be complicated to implement because there was a lack of formalization
and documentation (Hirschheim, 1983). Hirschheim also supported that they were
rarely repeated for a second time in the organizations they were developed for and that
there was a question about whether the busy co-participants agreed to follow its set of
principles. Focus on reaching consensus and forward democratic processes acts as
drawback against an efficient and coherent design.

Studies have shown that gaining access and motivating users to participate is a
problem. There were cases where participants did not appreciate their full engagement
in stages of the design process (Grudin, 1993, p.18). There is a reflection about
Participatory Design that because of its aim it cannot lead to radical change. PD practitioners are thinking of their work as "evolution, not revolution" (Summer and Stolze, 1997, p.1). Kensing and Blomberg (1998, p.173) provide some examples where PD projects have failed and the reasons why. They state that there have been projects where managers have merely participated or intentionally been left out. This was done because of the fear that the presence of the managers would make workers reluctant to express their opinions or would even totally silence them, even if in some projects the participation of the managers was set as a condition for its success.

The level of participants’ engagement has been different in various projects. Cooke and Kothari (2001) see participation as a process where unprepared people are called to carry the burden of taking decisions and actions. They refer to it as “a new tyranny” which is translated into a series of research techniques that put people to express views and experiences in the name of ‘empowerment’ but at the end rarely empowers them. Workers have been asked to express opinion but never had a voice in decision making. Sometimes they had limited or no control over the design process of the outcome. Some PD designers limited participation in having access in workers’ experience and skills. There is argumentation that the focus should not solely be on the end users as there may be others in the community who are affected by the designed changes also.

Responding to these criticism, PD evolved and its use started extending. Participatory research costs more in time and money than other kinds of researches like questionnaires or surveys. However it generates more accurate information about how community thinks and in the long term it is more cost-effective because it results to more effective interventions (Beazley and Ennew, 2006, p.192). Large systems, for example, in social and health contexts have been developed by the means of PD methods as a result of this aforementioned evolution (Pilemalm and Timpka, 2008).

4.5 Conclusion

Summing up, despite the criticism that has been made and the facts that there are cases of failure in the past, PD offers a highly fruitful theoretical and practical approach to use during this study so as to actively engage the employees in the inquiry to support the researcher and to bring them forward in decision taking and designing process of the solution that will facilitate their work. The employees need to support the researcher to understand the real context of their work practices. The designer needs to share his technological knowledge. All participants need to cooperate and support each other through mutual learning to design a mutually agreed realistic and feasible design that provides a new more efficient work practice.
5. Research Paradigm: Critical

In this chapter I write about the paradigm this study is based on. I state that it is based on the Critical Paradigm and I argue about it so as to explain to the reader the theoretical framework.

The research is based on the Critical Paradigm. According to Myers (2014), social reality people live in is “produced and reproduced” by them. They have the ability to consciously change economic and social circumstances. However there are various barriers – political, economic, social or cultural – that constrain this ability to change. The way people make sense and apply meanings of the world is based on theories about reality which are subjective.

The aim of critical research is to identify and critique drawbacks, contradictions and conflicts that prevent people to improve their private, social or working life. For the scope of the current study, access to reality through the “lenses” of the people participating so as we understand the meaning they are giving to it was necessary. Each participant's perspective of the situation also revealed his/her personal relevant value position according to his/her beliefs and ethical stance.

Alvesson and Deetz (2000) suggest three elements that comprise a critical research: insight, critique and transformative redefinition. The first element is concerned with gaining an in-depth knowledge and insightful understanding of the situation that will outline a careful description of it. This also includes interpretation of it. McGrath (2005, p.92) suggests that this element shares common ground with interpretive research and for that principles that are followed in the latter are fruitful here also.

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The second element is concerned with criticizing the described situation in terms of where power lies and whether there are conflicts, contradictions or power domination that create inequities between the participants. Myers and Klein (2011, p.26) propose that the researcher takes his/her own value position before the inquired situation and challenges beliefs and social practices identified during the study.

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The third element is concerned with suggesting improvements in the existing working and living conditions to eliminate possible drawbacks, contradictions or conflicts that came on the surface during the inquiry according to the previous elements. It is not rare that conflicts appear over design alternatives that the researcher must deal with using negotiations with the administration of the organization (Kensing and Blomberg, 1998, p.175).

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Improvements aim at both individual and societal level to the degree this is possible against the constraints mentioned above. Even though critical paradigm is mostly concerned in identifying and criticizing power domination, conflicts, inequities or alienation on societal or global level, it can be brought down to a smaller scale of interest like organizations. This has to do with the personal motivation of the researcher (Walsham, 2005, pp.112-113). As the conduct of this study led to a co-design of a
feasible intervention in work tasks, the effort for the desired transformation strove to include all of the above mentioned elements.

For conducting the research qualitative methods were used in an attempt to understand the situation from the point of view of people affected by it inside the social, cultural and institutional context it took place (Myers, 2014). No variables, independent or dependent, were predefined at the beginning but the focus was on the complexity of the situation (Kaplan and Maxwell, 1994, p.35). The data gathered generally had the form of words, not numbers (Lichtman, 2013). In the following sections, more about the methods and data analysis are stated.
6. Methods

In this chapter I write about the methods I used to conduct the study. These methods are 1) Interview, 2) Future Workshop and 3) Prototyping. I present the theoretical framework of the methods, their consistency to PD methodology and their practical appliance in this study.

The research followed certain PD methods so as to forward user engagement and active participation. Researcher and practitioners (coordinators of the organization) cooperated to analyze in depth the situation and propose ways to improve it. The whole research process promoted mutual learning. The researcher learned about the actual problematic situation the way practitioners perceive it according to their understanding (Bødker et al., 2004, p.73). Change in favor of the employees in a way that is beneficial for them was tried to be forwarded.

To have a successful participation we need to form a group of practitioners that makes things. This group must also be able to tell what it knows and enact the things of how it visions them to be in the future. These three activities are not isolated but they are iterative and are connected to each other with a circular connection of two-headed arrows. The continuing practice of these activities keeps the insights gained and the possibilities imagined alive (Brandt et al., 2012, p.149). The following figure illustrates the connection of the telling-making-enacting activities:

![Tell-Make-Enact diagram](Brandt et al., 2012, p.150)

During the study, practitioners not only had the opportunity to guide the researcher to create a vision according to their perspectives and needs, but had the opportunity to learn about IT research and design, and develop relevant skills and competences also. This may help each participant in his/her future career development (Bødker et al., 2004, p.58). To achieve maximum user engagement, fruitful methods for data gathering, analysis and design were chosen. In particular, interview, future workshop and prototyping were used.

6.1 Interview

Interviews are one of the most common techniques to gather information. A researcher uses interviews to collect data and information from a wide group of stakeholders, such as managers, administrators, employees or customers (Bødker et al., 2004, p.228).
There are three main types of interviews, structured, semi-structured and unstructured. For this case the semi-structured type was chosen because the concept was to ask generic questions that do not require predefined answers but aim to lead to a conversation. This kind of interview is of qualitative type and the interviewer may build his/her knowledge upon the answers he/she gets.

A semi-structured interview to gather data is a method that uses a checklist of headings to drive a broader discussion with the participants (Luck, 2003, p.526). The dialogue that unfolds during the semi-structured interview helps to reveal tacit knowledge (Luck, 2003, p.535) when the interviewee shares his/hers experience, point of views, critique and feeling about a situation. The themes discussed (see Table 6.1 below) varied from a start of information of generic concern such as information about the organization, its goals, activities and structures down to specific ones about certain processes, tasks and tools used for a specific purpose.

The interviewees were only two coordinators of the NCR who are in the first line of the organization’s operation. At first, topics of general interest were discussed and clarified like the strategic goals, operation and structure of the organization. Then questions about problematic situation were asked. The following specific topics were predefined to be discussed:

<table>
<thead>
<tr>
<th>Interview topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization’s goals and structure</td>
</tr>
<tr>
<td>Organization’s administrative structure</td>
</tr>
<tr>
<td>IS strategy</td>
</tr>
<tr>
<td>IT infrastructure</td>
</tr>
<tr>
<td>Problematic situations in every day work</td>
</tr>
</tbody>
</table>

Table 6.1 Topics that were discussed during the interview

The interview was open, so as to lead to a number of new questions and to a need of clarifications about points that might be unclear to the interviewer. The purpose of this was basically to:

- clarify the way the work is done and divide it into tasks
- clarify which tasks are supported by organization’s IS
- find out about the IT systems used (hardware, software, network, configuration).
- discuss which work tasks seem to be problematic and can be improved

The interview was crucial because its outcome gave a good insight of the NCR. Knowledge about the operational, cultural, political and legal context of the organization was gained. Besides that, it helped create a bond of friendship and understanding with the coordinators. It took place outside the workplace of the NCR. The goal of this choice was to make the interviewees feel comfortable. Documentation
that was necessary to get more information about the topics that were discussed, like the administrative structure, the goals of the NCR and the programs the organization runs, was sent by e-mail the same day after the end of the meeting.

Both interviewees participated in the interview. This means there were no separate interviews with each one. This was decided for two reasons. The first one was that the employees were expected to act complementary to each other. They were all going to help to create a rich picture of the situation by giving their own knowledge and perspectives of it. The second one was to save time, as much more would be needed to perform separate interviews and process them afterwards.

The discussion between me and the interviewees was transcribed by keeping notes. The notes were kept in the forms of keywords and key sentences. They were stored in a notepad mobile application. Some complex processes were depicted as sketches on paper. The interviewees were asked to show or even provide documentation or objects that were used during the activities of inquiry. Very shortly after the end of the interview, the data collected were analyzed using thematic analysis method (see section 6.4 Data analysis and theoretical framework).

Detailed transcription of the interview can be seen in Appendix C – Detailed presentation of NCR’s structure. Its data analysis is presented in section 8.1 Interview – Critique phase of Future Workshop.

6.2 Future Workshop

It is a very useful technique to outline a joint proposal to improve a problematic situation. The researcher may use it to gather the different viewpoints of the stakeholders about which is the problematic situation to deal with and conclude to mutual accepted change. The aim of a future workshop is for all participants to share their perspective of the problematic situation, see how the others perceive it, come to a shared in-depth understanding of it and conclude to a common structured proposal for improving it.

This method is used in the stage when designers and users collaborate and interact to inquiry organization’s workplace, to clarify goals and values, and to envision the future (Spinuzzi, 2005, p.167). The people involved have the opportunity to freely express their view and opinion about what dissatisfies them and propose ways of how this can be done differently. One main advantage of the technique is that it generates enthusiasm as a motivation to the participants to engage them in the inquiry and design processes (Bødker et al., 2004, p.272). Future Workshop is structured in five phases: Preparation, Critique, Fantasy, Realization and Follow up.

The two coordinators who participated in the Interview participated in the Future Workshop also. The time and place was scheduled according to their workload. The duration of the technique was approximately three hours. This was done because the number of the employees who participated was very small and because a duration of
more than three hours for the whole process would probably be proven to be uncomfortable or exhausting for the participants. The place was set to be the workplace of the coordinators because they wouldn’t had had to move to another place and loose time and because the workplace had the prerequisites (enough space and a big table) to conduct the method.

a) Preparation Phase (duration: ½ hour)
The technique was performed around a big table so that all persons could sit comfortably and have big sheets of white paper in front of them. Even if all employees and volunteers were welcomed to participate only two coordinators, as stated before, were finally available. The place was decided to be the meeting room at the workplace of the NCR.

The decision was made this way for two reasons: 1) The participants would already be there as it is their workplace and would not had to move and loose time to go to another place. 2) The Lab has already an open space with a big table very useful to conduct the method. The coordinators who participated were the one of the Culture Lab and the one of the Center for the child. It was very difficult to have at the same time a volunteer available to participate in. We decided that an effort to have more people involved would be so problematic that it could even cancel the workshop.

The participants were introduced to the Future Workshop method. They were reminded about the Participatory Design methodology, its origins, scopes and basic principles and values, scope of the current research and scope of the workshop. They were also free to ask if they needed any kind of clarification before the start of and during the workshop. A set of useful tools where prepared to be given. These were:

1. white papers of size A3
2. white papers of size A4
3. blue & red pens
4. pencils & rubbers
5. pack of post-it papers

The participants were free to use whatever felt convenient to write down their ideas for the workshop. The topic on which the participants were going to work on was clearly stated. That was to define problematic situations of their everyday worklife and then co-decide at least one of them that we were going to deal with and specify which improvements would result to a feasible intervention.

b) Critique Phase (duration: 1 hour)
The coordinators started expressing their perspectives and critique about the stated topic in the form of brainstorming. At the same time they were encouraged to keep notes of what they thought that was important in the form of keywords on a paper each. This part lasted about ½ hour. The next ½ hour the participants wrote their thoughts on a new shared blank document. After that they prioritized them on the basis of which one is more important than another. The decision about the priorities was based upon an extended discussion. This phase led to have a common ground about how the group
viewed problematic situations. On this common ground the participants stood upon to outline improvements.

c) Fantasy Phase (duration: ½ hour)
The goal of this phase was every participant to write down any kind of improvement about the situation without any restriction. This led to some ideas and proposals that were unrealistic. The researcher asked and encouraged the participants to formulate their ideas into keywords, without putting any restrictions about what can be real or not. The participants used brainstorming about how they imagined of their work, organization and environment, the technology use, the cooperation and communication with colleagues, volunteers and children members of the NCR. Each one wrote down her ideas on a white paper. Afterwards they discussed about the keywords they had written down, grouped them into themes and gathered the groups into one shared document. The groups were a starting point to formulate more or less utopian proposals for improvements.

d) Realization Phase (duration: 1 hour)
This was the phase when the participants concluded to one joint proposal for improvement that could be feasible and sustainable. They started with a presentation of their proposals made in the previous phase. They assessed them according to the real conditions at work and those of them that seemed to be the most unrealistic were left out. They discussed about the remaining ones and they came up to a common suggestion. The suggestion was the problematic situation participants decided to work on. They defined specifications about what should be done to improve the situation. The result of the phase was a shared document with the vision of the design outcome.

e) Follow up
A follow-up phase may be also implemented in this method (van der Velden and Mörtberg, 2015, p.56). This phase is necessary when the participants have to provide extra information in any form to support or complement the work done during the previous phases and especially in the realization phase. In our case this phase was embodied in prototyping, when the participants tested and evaluated the design outcome according to the proposed solution.

The results of the Critique, Fantasy and Realization phases can be seen in Appendix D - Outcomes of the Future Workshop. Data analysis of the Critique Phase is presented in section 8.1 Interview – Critique phase of Future Workshop. Data analysis of the Realization Phase that formed the base of the vision for an improvement for the selected problematic situation, which was the registry file application of the organization, is presented in Table 8.2 Data analysis of the registry file problematic issues (see section 8.2 Realization phase of Future Workshop).
6.3 Prototyping

Prototyping is one of the most important methods in PD. It is used to materialize the requirements and specifications that have been transcribed during the prior research into a concrete IT artifact. As Mercer (2006, p.97) points out, when working with NGOs, organizations and their stakeholders are clearly benefited when tangible improvements are made. van der Velden and Mörtberg (2015) call it participatory prototyping and describe it as a “shared design space” where participants enact design scenarios to visualize and experience possibilities of “what could be”. Prototypes may have different forms. They can be mock-ups in paper, design sketches or digital artifacts that represent an early version of the final product.

Prototyping is an iterative process and it often leads to a “high-fidelity prototype” that includes all the requirements of the final product (van der Velden and Mörtberg, 2015). According to Bødker et al. (2004, p.293) it consists of three stages – “developing the prototype, testing the prototype, and evaluating the experience” – which are circularly repeated several times as shown in Figure 6.2:

![Figure 6.2 The circular iterative process of prototyping (Bødker et al., 2004, p.294)](image)

It is a significant method to transform participants’ visions and values into a tangible artifact. It is used to bring forward new opportunities and ideas as well as to reveal possible obstacles. Spinuzzi (2005, p.67) argues that if the prototype is a working one it can be conducted in the workplace with the participation of the users evolved to co-explore with the designer and evaluate its potentials. Experimenting with early (or demo) versions of a final product can yield experiences that may lead to changes of defined specifications or clarifications and corrections of misunderstandings during earlier stages of the research and design processes (Bødker et al., 2004, p.297).

According to Löwgren and Stolterman, (2004, pp.17-19) during the design process the participants move from vision that emerges at the early stages to an operative image and finally to the specifications of the outcome (Figure 6.3). In this study the vision
emerged at the Future Workshop where the participants decided about which problematic situation they wanted to deal with and envisioned a way to improve it. In prototyping this vision turned to an operative image. This is an artifact that can be used and comes to turn the vision of the solution into reality. Working on the prototype we concluded to its detailed specifications, that is which are exactly its attributes and functionalities so as to fulfill the vision and needs of the participants.

![Figure 6.3 From vision to specifications of the design outcome (Löwgren and Stolterman, 2004)](image)

We need to always keep in mind that in PD the participants are typically required to critique the processes outcomes (Spinuzzi, 2005, p.169). When a researcher designs an artifact he/she creates at the same time a set of activities that follow it. Users need to experiment with the new application in order to pose demands and give feedback about it. Because designers and users have different backgrounds the first have to infuse the latter with new ideas to motivate them transcend their current practices (Bødker and Iversen, 2002, p.12).

Bødker et al. (2004, p.293) distinguish prototypes into two categories: horizontal and vertical. As horizontal, they characterize the prototypes that are used to simulate scenarios in order to test them. They are easy to create and use but they produce limited outcome to evaluate. They are mostly used in the early stages of the design process and help the effort to move from vision to specifications of the final product. On the other hand, vertical prototypes are much closer to the final product as they provide a more stable version of it. They are tools to make tests using real data in the actual work environment. They produce more knowledge to evaluate the desirable design outcome than the horizontal ones. In this study we proceeded to a vertical prototype application.

6.4 Data analysis theoretical framework

Data Analysis is a process that proceeds along with the research conduct. There are two ways to perform it. One is by starting doing the analysis after all data are gathered. The other is by starting it along with the data gathering process. There is a suggestion that the ideal about the research is to follow a model of gathering and analyzing data
simultaneously (Lichtman, 2013, p.247). This model is iterative and it was followed in this study.

The methods chosen for data gathering had as outcomes digital reports that had the information, thoughts, opinions, suggestions and proposals of the participants written on them. After the end of Interview we had an transcription of it together with provided web links and other digital sources. After the end of the Future Workshop we had papers with the intellectual work of the employees and, the most important, a paper with a proposal of a feasible and sustainable improvement for the problematic situation at hand. All these created an amount of text to analyze.

In qualitative research, one of the most common analysis procedure is to code words, phrases or chunks of text to arrive to themes. This process can be seen as one of organizing the material obtained during the inquiry and categorizing it to codes. The researcher starts with an amount of documented data and ends up with a number of themes to represent them. One limitation is that this procedure is working in a reductionist manner because we need to capture all information, thoughts and feelings of the participants written down and codify them in a specific number of themes.

The way the Interview and Future Workshop were transcribed and analyzed followed the approach Riessman (2008) calls the Thematic Analysis of narratives. According to Riessman (2008, pp.53-54) there are cases where we are interested in “what” is said, rather than “by whom” or for “what purpose”. This has been exactly our case, since by interviewing the coordinators our interest was focused on learning and exploring the goals, structures, and operation of the NCR, as well as in Future Workshop to explore problematic situations and possible solutions.

Writing about Thematic Analysis, Riessman (2008) does not provide some strict set of rules but gives guiding lines and examples. She points out that “Thematic analysis relies on categorizing accounts or aspect of accounts that are being told” (Lichtman, 2013, p.256). One objective is to come to a number of stable themes that will help to carry on with the research. As written in section 6.1 Interview, the interview was prepared to be a semi-structured one with a number of issues to discuss and analyze (see Table 6.1 Topics that were discussed during the interview). These issues provided an early basis of themes that led to a number of concepts for the data analysis.

According to Clarke and Braun (2017, pp.297-298) the researcher can organize and report his/her analytic observations using themes as a framework to do so. Thematic analysis aims at identifying and interpreting the significant features of the data gathered in qualitative research giving emphasis in high precision and quality analysis. It is flexible as it can be used in a variety of data collection methods and it can be used to analyze small or large data sets. It is a method that suits to any qualitative research question. The following Figure 6.4 illustrates the Thematic Analysis framework:
Figure 6.4 Thematic Analysis
7. Ethical Considerations

In this chapter I introduce the value centered nature of the PD methodology to the reader. This is a characteristic that makes PD suitable to confront the ethical considerations of this study. I describe the details about the information and consent form that informs the participants about what they should know for this study in order to participate in. Finally I present special ethical considerations that we faced during the research and how we decided to deal with them.

van der Velden and Mörtberg (2015, p.46) argue that “Participatory Design is a value-centered design approach because of its ethical motivation, which is “built on values”. PD is based on participation and democracy principle values (Bratteteig et al. 2012; Robertson and Wagner 2012 cited in van der Velden and Mörtberg, 2015, p.43). During the conduct of PD methods the values of participants emerged. These are to be maintained throughout the whole research and design processes and enable mutual trust among the participants, and they are finally materialized in the design artifact (van der Velden and Mörtberg, 2015, pp.43-44).

Researchers are responsible to protect participants from getting harmed either by the conduct of the research or by the dissemination of its results. They have to take care of “respect, confidentiality, privacy and anonymity” issues (Beazley and Ennew, 2006, p.196). PD frontloads a set of moral values that emerges according to the context of each particular project and thus differs each time. How these values are to be embodied in the final product as well as the confrontation of possible conflicts is an outcome of a dialogical process. We need to consider that the context of each value has not the same meaning for everyone.

We use the notion of the “contact zone” to understand the design process as a space where the participants respectfully overcome differences and meet on a common ground (van der Velden and Mörtberg, 2015, pp.47-48). This argumentation clearly proves that PD methodology natively confronts ethical considerations and respects participants’ values. In this study we made a considerable effort to address the ethical considerations before or during the time they emerged. Before the start of the research, all persons about to involve received written information about it. The information was included in an information and consent form.

This form contained everything the participants ought to know about the research in order to decide whether or not they wished to engage to it. The text of the form was in simple and clear language so as the persons who read it, were able to clearly understand its context and minimize the possibility of being tricked or uncertain by difficult or unknown scientific terminology. The text covered two and a half A4-sized pages. At the end it was signed by all parties included in the research. A copy of the final information and consent form has been added as Appendix B - Information for research participants / Consent form.
According to instructions provided by the Central Ethical Review Board (2016) and published at CODEX website (http://codex.vr.se), which is operated by the Swedish Research Council (http://www.vr.se) in cooperation with the Center for research ethics and bioethics (http://www.crb.uu.se) at Uppsala University, the information and consent form included the following parts:

1. **Background and purpose**: a brief and clear description about the purpose and respective background of the inquiry.
2. **Inquiry concerning participation**: a statement about the reason the specific practitioners has been chosen for conducting the study.
3. **Study methodology**: a simple description about methods and procedures that are going to be followed during the research; the description was based on participants’ point of view so that they would understand what is their engagement.
4. **Advantages of research**: a statement about the possible advantages of current study's outcomes and how the participants would be benefited by them.
5. **Confidentiality**: in this sections there was a detailed reference about how the data would be analyzed and stored, who (individuals and legal entities) was going to have access to them and how the researcher would ensure confidentiality and prevent unauthorized access.
6. **Availability of study's result**: a statement about participants' right to have access to stored data and results of the study.
7. **Voluntariness**: here it was clarified that the participation of all individuals was voluntarily; whenever any individual decided so he/she could end his/her participation at the research and ask to withdraw and destroy any data given by him/her.
8. **Responsibility**: in this part the researcher and the research body who were responsible for the completion of the inquiry were stated. There was detailed information (address, phone number, e-mail address) about how to contact the responsible researcher.

In his book “Digital Media Ethics” Charles Ess writes about Luciano Floridi’s description of private information as a part of human existence itself (Ess, 2013, p.52). In another part of his book, he refers to Herman Tavani who, among others, defines the notion of informational privacy (Ess, 2013, p.72). That is the ability of each person to fully control all information that he/she considers to be personal. Both interpretations outline the significance of private information at least in contemporary developed societies for individuals. From the beginning of the study special consideration was given for ensuring the participants about securing any kind of private data that would come into researcher’s possession.

No children members were intended to be invited to participate for two reasons. The first one was because of the more complex procedure of consent needed, that includes both children and their custodians to be involved. The second one was because the coordinators preferred to leave children away from activities that would possibly remind them unhappy memories of the past, e.g. questioning by police authorities. All
participants who signed the consent form were given the opportunity to ask questions about anything that they felt they needed to clarify or was not mentioned in the form and they wanted to know about. The form was open to be altered or completed with any information participants might have required in cooperation with the researcher.

During the study, the coordinators decided to work on the registry file of the organization. This is the file where NCR keeps personal information about the children members and the volunteers. The file is stored in one computer in the Culture Lab and a copy is stored in another one at the same place for backup. It can be accessed only by the members of the administration board, the general manager and the coordinators. There are periods of time when one volunteer undertakes to insert data or update the file. This volunteer is under Culture Lab coordinator’s surveillance.

The persons who can have access to these data are obliged by the Hellenic Data Protection Authority’s and NCR’s regulations not to distribute them by any means without the written consent of their owners. For this the participants decided to work on the file without the original data of the children and the volunteers but with imaginary – not real – ones just for test purposes. The original registry file was given to the researcher with no information stored. When the time came to test and evaluate the prototype imaginary information was used by the researcher.

This way we dealt with two problematic situations. The first one was a non-authorized person, such as the researcher, to have access to personal information without the written consent of the owners. This could have been solved by having written consent from some of the owners but this would have been very time consuming. The second one was the storage of these information in a computer outside the NCR’s facilities, something that is against organization’s internal regulations. Using the practice of inserting imaginary data into the registry file for designing and testing purposes we ensured that I, who didn’t get such authorization, had no access to the private information of members and volunteers kept by the NCR.
8. Data Analysis

In this chapter I present the data analysis results of the empirical data gathered. There are two separated data analyses, one for the problematic situations coordinates generally face in their workplace and one for the specific problematic situation they decided to work on and improve.

For data analysis the thematic analysis framework was followed (see section 6.4 Data analysis theoretical framework). The material gathered during the Interview and Future Workshop was codified and then grouped into themes that represent an overview of problematic issues coordinators face in their everyday work. In the next section all problematic situations that are present in the workplace according to the coordinators are presented. These situations were discussed during the Interview and Critique phase of the Future Workshop. Afterwards the aspects of the specific issue that the participants decided they are willing to improve is presented. These come from the Realization phase of the Future Workshop.

8.1 Interview – Critique phase of Future Workshop

Thematic analysis of the Interview and the Critique phase of the Future Workshop led to the following codes and themes:

<table>
<thead>
<tr>
<th>Codes</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundraising</td>
<td>Limited finance to support activities</td>
</tr>
<tr>
<td>Materials provision</td>
<td></td>
</tr>
<tr>
<td>Publicity</td>
<td></td>
</tr>
<tr>
<td>IT professional support</td>
<td>Lack of IS strategy plan</td>
</tr>
<tr>
<td>Library management software</td>
<td></td>
</tr>
<tr>
<td>Registry file</td>
<td></td>
</tr>
<tr>
<td>Warehouse management software</td>
<td></td>
</tr>
<tr>
<td>Temporariness of volunteers</td>
<td>Inadequacy of staff to fulfill tasks</td>
</tr>
<tr>
<td>Small number of permanent employees</td>
<td></td>
</tr>
<tr>
<td>Volunteers training</td>
<td></td>
</tr>
</tbody>
</table>

Table 8.1 Data analysis of the problematic situations

- **Limited finance to support activities**
  It has already been written that the funding of the organization is limited. The impact of this has consequences to several aspects of NCR’s operation. At the same time the organization tries to find ways to increase funding.
1. **Fundraising:** The employees strive to get financial help by the state, NGOs, public and private organizations, and individuals. These attempts are not always successful and there are tries to find ways that will lead to better results.

2. **Materials provision:** NCR has needs for materials to use either for its own internal operation or for organizing activities for the children. There are times when providers are not interested to give offers for materials provision because they find this not profitable and times when offers are found to be of high cost without cheaper alternatives.

3. **Publicity:** NCR needs to widely advertise its work to the public for several reasons. This will bring more people or organizations that will fund its work, more providers that will give offers for materials provision and more volunteers who will be registered. Even if today it is easy to have free publicity at the social media the organization does not seem to have taken much advantage of this until now. There is also the issue that it has to pay to have publicity on TV or radio stations.

   - **Lack of IS strategy plan**
     NCR has not created a plan for its IS strategy. Its IS has been formed on the basis of its needs as these come up during its operation. There is no IT professional support. No special software has been purchased. For this there are a lot of issues that create problems in the worklife of its employees and volunteers.

   1. **IT professional support:** employees sometimes face malfunctions of the devices or the software used. There is no professional technical support. From time to time there are external partners to help with this but this is temporary.

   2. **Library management software:** there is no special software to help employees and volunteers with the organization and management of the lending library.

   3. **Registry file:** information of children members and volunteers is kept in a Microsoft Excel file developed by the coordinators. Coordinators state that the file is not so user friendly and there are more functions that can be supported by it but they are not able to develop them.

   4. **Warehouse management software:** there is no special software to help employees and volunteers with the organization and management of the warehouse where provisions for NCR’s internal operation or for the help of children and their parents are stored.

   - **Inadequacy of staff to fulfill tasks**
     There is sometimes problem to fulfill everyday tasks or cancellation of activities because there is no time when other obligations are more significant to be done or there is lack of employees of volunteers to do them.
1. **Temporariness of volunteers**: volunteers are very crucial for NCR’s operation. There is a frequent change of volunteers (see *Mechanisms for consensus/agreement and representation* in 10.2.2 Criterion #2: Collaborative development for more details). There are times when there is lack of volunteers for certain tasks and others when activities are canceled because the volunteers involved leave the organization.

2. **Small number of permanent employees**: the low funding of the organization results, among others, to a small number of permanent employees who are working hard and sometimes cancel tasks as they don’t have time to fulfill them.

3. **Volunteers training**: besides the temporariness of volunteers, there is difficulty to properly train them, either because the employees don’t have time to do it or because there is no one capable to do it at that time.

### 8.2 Realization phase of Future Workshop

In realization phase coordinators co-decided which problematic situation they wanted to deal with and try to improve. The decision was made after discussion between all participants (coordinators and me) trying to decide what is that brings difficulties in their everyday work. Other factors taken under serious consideration were the time available to design the improvement and the absence of participation of other stakeholders like more employees or volunteers who should have been engaged in the research and design processes (see section *Mechanisms for consensus/agreement and representation* in 10.2.2 Criterion #2: Collaborative Development for details upon this limitation of the study).

Coordinators agreed that the registration process of children members and volunteers, and especially the registry file they use for this purpose has been causing problems from the beginning of NCR’s operation. As written in section 1.3 Problematic situations at NCR’s Information System registry file is a Microsoft Excel sheet developed by the coordinators alone to store information for both two groups of people who are registered. The following Table 8.2 Data analysis of the registry file problematic issues illustrates the analysis of the problems coordinators face when they use it:
Table 8.2 Data analysis of the registry file problematic issues

- **There is lack of features that help user to avoid mistakes when inserting data**

  1. **No data validation**: there are no checks whether the user inserts the correct type of data, for example if he/she inserts text in a phone or date field.

  2. **No list of values**: there are no defined lists that the user can use to insert values which are fixed like names of countries or school classes.

  3. **No user informing**: Microsoft Excel provides the functionality to have pop-up text boxes to inform user for what he/she can insert in a cell or for a mistake he/she made. This functionality is not implemented.

- **The application does not provide the information in an easy to read format**

  1. **Complex fields**: there are fields which contain data that are usually inserted in separated ones, such as father’s/mother’s name or home address/municipality.

  2. **Mixed fields order**: related fields in a registry should be grouped together. In the old registry file this does not happen and it is difficult when a user wants to retrieve data.

  3. **Mixing of groups**: in the application coordinators store information for both children and volunteers. They are stored in the same sheet. This makes difficult for coordinators to look for information regarding only children or only volunteers. Another issue is that a number of fields used for each group has no meaning for the other one.

<table>
<thead>
<tr>
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</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Mixing of groups</td>
<td></td>
</tr>
<tr>
<td>Unsoted information</td>
<td></td>
</tr>
<tr>
<td>Lack of graphs</td>
<td>The application does not provide all the information coordinators need for their work.</td>
</tr>
<tr>
<td>Not enough information stored</td>
<td></td>
</tr>
</tbody>
</table>
4. **Unsorted information:** right now the information stored for each child or volunteer is not sorted by any criterion. Even if Microsoft Excel provides tools for easy instant sorting these are not implemented and the user should know how to use the menus of the Microsoft Excel itself to do so.

- **The application does not provide all the information coordinators need for their work**

  1. **Lack of graphs:** coordinators need statistics to use in presentations and proposals. Microsoft Excel provides many type of graphs to visualize statistics. The registry file has no such functionality embedded. The coordinators are preparing the graphs in new sheets manually.

  2. **Not enough information stored:** the fields used in the old registry do not store enough information to satisfy the needs of coordinators. For example there is no field for the children to store whether they attend any educational course and which this is.

**8.3 Summary**

During Interview and Critique phase of the Future Workshop coordinators talked about problematic situations they faced in their everyday work. Thematic analysis (see section 6.4 *Data analysis theoretical framework*) was used to find out repetitive patterns on what was told, assign them codes and then group codes which have internal relations in the operation of NCR into themes. The analysis resulted to three themes: 1. Limited finance to support NCR’s activities, 2. Lack of strategic IT plan to support everyday tasks and 3. Inadequacy of staff to fulfill tasks because of certain reasons.

In Realization phase of Future Workshop coordinators were called to decide about one problematic situation that they found very important for their work-life, wanted to work on it and design feasible improvements for it. Data analysis showed that they focused on the registration process which had been problematic since the beginning or NCR’s operation and especially on the registry file where they store information about children and volunteers who are registered in the organization.

Analysis resulted to three themes about the registry application: 1. it does not provide functionalities to help user to avoid mistakes when he/she inserts data, 2. the way the fields are arranged does not help the user to read and retrieve data easily, 3. the application does not include all the data or provide all the information that coordinators need for their tasks. Data analysis of the Realization phase was the point where participants moved to the stage of design and started visualizing an improved registry file and setting down the initial specifications for it that would lead to an improvement of the problematic issue presented in *Table 8.2*. 
9. Design

In this section I present the way participants were actively engaged and cooperated to design and implement the prototype application. I include a small number of screenshots of the new Microsoft Excel application to give a clear overview of how practitioners worked for the visualized outcome at the Realization phase of the Future Workshop.

9.1 From vision to specifications

According to Löwgren and Stolterman (2004) during the design participants move from a vision of an outcome to an operative image and finally to its specifications. During the next meeting right after the Future Workshop, coordinators provided me a copy of the old registry file after they had deleted all information stored (see chapter 7. Ethical Considerations) to see how it was developed. A screenshot of the sheet¹ is shown in Figures 9.1 and 9.2.

Figure 9.1 Old registry file (left part)

Figure 9.2 Old registry file (right part)

Studying the old registry file we specified certain issues which are related to the codes and themes shown in Table 8.2 Data analysis of the registry file problematic issues:

- All fields (information) are organized in a simple horizontal list. They do not form a table (as it is defined in Microsoft Excel).
- Information for both children members and volunteers is entered in the same list. Information kept for each of the two groups is different. For example, fields as School (Σχολείο) and Class (Τάξη) have no meaning for the volunteers. When the record concerns a volunteer these kinds of fields are just left blank.
- Member’s Registration number (Α.Μ. Μέλους) is used to be the first field in a person’s record. In this list it is not. Registration number is used as a unique key field that represents each person in the organization’s registry file.

¹. Fields are shown in Greek language. The reader can see their translation in English in Appendix G – Translation of field names of the original registry file from Greek to English language.
• Some fields seem to be a combination of simpler fields and can be divided. For example, the Father/Mother Name (Όνομα Πατέρα/Μητέρας) field can be divided into two fields.
• There is lack of fields that are commonly used in registration files. For example, there is the Phone Number (Τηλέφωνο) field but there is no Mobile Phone or E-mail Address field.
• For each school year there is the field Card Renewal […] (Ανανέωση Κάρτας […] ) that informs whether the member has renewed his/hers registration for each school year. For this field the symbol @ is used to denote the renewal.
• There are no embedded tools for filtering and sorting of records. If the user wants to perform these kinds of operation has to be aware and use the menu commands of the Microsoft Excel application.
• The user is entering all fields using free text. There is no option to enter specific values (e.g. Boy/Girl) from a relevant list for certain fields.
• There is no data validation in any field when entering data.
• There are no statistics at all.

Then we moved forward to a discussion about their vision of a new improved version of the application and we wrote down an initial set of specifications to implement for an operative image of the final prototype. These are shown in the following Table 9.1:

<table>
<thead>
<tr>
<th>Initial specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Data verification</td>
</tr>
<tr>
<td>• Groups separation</td>
</tr>
<tr>
<td>• Fields braking</td>
</tr>
<tr>
<td>• Fields order</td>
</tr>
<tr>
<td>• Graphs</td>
</tr>
<tr>
<td>• Lists of values</td>
</tr>
<tr>
<td>• New fields</td>
</tr>
<tr>
<td>• Registration renewal</td>
</tr>
<tr>
<td>• Shorting</td>
</tr>
<tr>
<td>• User informing</td>
</tr>
</tbody>
</table>

Table 9.1 Initial specifications of an operative image of the prototype

• **Data verification**: There is no data verification when a user inserts a value. For example only yes or no values should be inserted in the field of registration renewal or only date format should be used in the field of date of birth. This would help users who insert data to avoid mistakes.
• **Groups separation**: information about children and volunteers are inserted in the same sheet. The groups are different and should be separated into different sheets. Fields of information used for each group are not the same.
• **Field braking**: some fields contain data that can be further separated into more than one fields. For example there is only one fielded for father's and mother's name or for family status.

• **Fields order**: fields sequence should be reordered so as group of fields that contain similar information to be together.

• **Graphs**: coordinators are creating graphs either for presentations or for proposals. Old registry file does not provide any statistics. Coordinators need them to be automatically generated for use.

• **List of values**: Some fields like country of origin or school class should accept certain values. These values can be set in a list and the user can use it to insert the value. This makes data insertion easier. The combination of this feature with data verification eliminates the possibility to insert any value different than those in the list.

• **New fields**: the coordinators need more information than this stored in the old file. New fields need to be added.

• **Registration renewal**: The field shows whether a child has renewed his/her registration for a given school year. This should accept only the Yes/No values.

• **Sorting**: there is no easy way to sort data according to one or more fields, for example to sort children according to country of origin or school class. The new application has to have tools for easy sorting.

• **User informing**: when the user goes to insert a value in a cell, a pop-up text box should inform him about accepted data types or about lists of values if available. If the user makes a mistake a pop-up text should give him information about how to insert a correct value.

9.2 Telling – Making – Enacting

In the next phase we started working on the prototype. We started developing the registry file according to the initial specifications. We had meetings where we discussed what we had done so far. There were six live meetings and a number of communications by phone or by e-mail. Before proceeding to tests I used to show them how to implement the new features using the Microsoft Excel tools forwarding mutual learning (see section 4.3 Core elements of PD). We were testing the prototype using imaginary data (see chapter 7. Ethical Consideration).

Coordinators were keep testing the prototype after the end of our live meetings to get a better insight of the prototype, trying to make small changes on their own, discovering malfunctions or thinking of more potentials. After the tests we were trying to solve malfunctions that appeared and we were discussing about changing or implementing new specifications. This circle of practices such as discussing about needs and specifications, implementing features, and testing and evaluating the prototype followed the circular model of Tell-Make-Enact by Brandt et al. (2012) which was discussed in chapter 6 Methods.

The same practices were also consistent with the model of circular iterative process of “developing the prototype, testing the prototype, and evaluating the experience”
Bødker et al. (2004) argued about (see section 6.3 Prototyping). Practitioners (coordinators and me), either separated or together, started developing the prototype. When development had reached to a level, we were testing the prototype. We were evaluating the results and we were discussing what we should change and which were the next steps to improve the prototype. Then we were moving back to the stage of development and starting over the repetition of those stages.

Both circular processes were not followed only in one way. There were times that they were followed the opposite way. There were times when we needed to go back and forth discussing changes and making changes before we go to tests. There were times when in order to have a more concrete evaluation we went back once or twice to test again the application. This competence to go back and forth to stages defined in the above Tell – Make – Enact and Prototype Development – Prototype Testing – Experience Evaluation models is depicted with the two-headed arrows which show the bidirectional flow of the processes.

9.3 Prototype application

In this section screenshots of the final form of the prototype are presented. A full set of screenshots of all improvements and functionalities of the prototype are presented in Appendix G - Screenshots of the prototype application. In these screenshots all field names are shown in Greek language. In Appendix H – Translation of field names of the prototype application from Greek to English language the reader can see their translation in English.

![Figure 9.3 Sheet of children members’ registration (left, middle and right part of the records)](image-url)
The above screenshots and those presented in Appendix G – Screenshots of the prototype application show the implementation of the specifications decided by the NCR employees and presented in Table 9.1 Initial specifications of an operative image of the prototype. As described before these specifications were evaluated, modified or changed during the Tell – Make – Enact and Prototype Development – Prototype Testing – Experience Evaluation cycles that were followed before we reached to the final version of the prototype.

9.4 Summary

Designing the prototype started right after the Future Workshop. We used the existing Microsoft Excel file to build the new form of the registry file. Coordinators and me set down the specifications and I helped them to decide about which functionalities can be implemented and how. Together we went on with the implementation. The process of prototyping went through stages that were repeated back and forth several times until the coordinators accepted the prototype as an outcome consistent with what they had visualized to improve the situation.
The two models of *Tell – Make – Enact* and *Prototype Development – Prototype Testing – Experience Evaluation* were followed during prototyping. All participants actively participated in the process of design by continuously discussing about and setting the specifications, implementing the improvements, testing and assessing the progress and finally by accepting it. The application went through the cycle of development, testing and evaluation. These stages were iterative. Practitioners went back and forth to those stages in order to have more concrete results in each one.
10. Discussion

In this chapter I evaluate the application built during the prototyping method. Next I evaluate this study using the three criteria set by Spinuzzi (2005). Both evaluations are qualitative. At the end of the second evaluation I’m attempting a quantification of it using a set of a four scale metric. The aim is to reveal the major obstacles faced so as to answer the research question.

In such difficult times, when NGOs like NCR have undertaken to provide children, who live in problematic situations, with food, medicines, clothing, education and entertainment, it is very important to help their employees to focus on primary goals. There is a number of tasks to be done, like the registration process, that are non-critical but important. However, it is not what employees should spend much time and energy on. Non-critical processes should be carried away as quickly as possible and leave employees time to organize more activities. Yet, there is no funding to hire a large number of people to share the work load. Small scale interventions could help the employees spend more time on helping the children and, looking at the big picture, on helping in a way to keep local communities cohesive.

In order to answer the research question that was introduced in section 1.4, together with the coordinators, we searched for potential problematic situations in order to improve them. This will hopefully be directly beneficial for them. It will result to fulfill tasks in more comfortable way and less time. Thus, they will have more time to spend for organizing actions for education and entertainment of the children, or other activities like providing the children and their families with food, clothes and health advisory. In other words, the direct stakeholders of the situation who will be benefited are the employees of the organization who will have more time to fulfill other, more significant to the NCR, tasks and the indirect stakeholders are especially the children members and their families who will get more time with the employees for cooperation, services and activities.

Possible changes of an aspect of the information system may impact on other aspects as well. There are many factors that need to be studied. Changes could create restructures of different nature. Employees need to be informed and be aware of this kind of consequences that a small reform on work practices or on information technology may result. As Grüner (2009) points out, there may need to be minor reformations in the structure of the organization on how steps are performed so as to achieve better results. The researcher should not only share technological knowledge with other participants but should inform them about possible consequences of the proposed solutions on organizational and managerial aspects as well.

Extra attention to unexpected side effects that would probably affect negatively the development or implementation cycle had to be paid (Ciborra, 2000 cited in Pan et al., 2008). For example, in earlier projects that took place in the same organization, employees faced postpones of some meetings that had been scheduled, but being flexible they rescheduled and succeeded to do some of them. Yeo (2002) draws our
attention to the fact that today the gap between theory and practice in IS studies particularly still remains. Several factors have to be considered carefully to ensure success. The new improved information system must correspond to agreed user requirements and design specifications, meet end users expectations and satisfy them with the way it operates (Yeo, 2002). Otherwise, we endanger the successful result of the proposed research.

In order to answer the research question certain criteria to explore if they were fulfilled or not during the research and design processes were set. A reference to these criteria has already been done in relevant literature. In this paper they are used in their original form and a discussion whether and in what degree this study has been consistent with them takes place. To have a better picture of the degree of consistency with these criteria, a table with a four scale quantification for each one of the characteristics (see below section 10.2.4 Evaluation table) is used. Of course, the assessment of this research according to the criteria set is subjective and it is probable the reader to have a different opinion on some aspects of it.

10.1 Evaluating the application

Before the evaluation of the whole process of the study, an evaluation of the application as the outcome of it is done. The purpose of this evaluation is to prove that the outcome turned out to create a feasible intervention which improved the problematic situation we dealt with. This is a necessary step to move forward to the answer of the research question. Feasible interventions is a prerequisite for a successful research and design project. The same applies in this case of designing intervention in this NGO.

During prototyping there were six meetings when employees tested and evaluated the application until that time. Each test and evaluation led to changes or further development of the prototype according to the Prototype Development – Prototype Testing – Experience Evaluation cycle (see Figure 6.2). At these meetings employees practiced the use of the application and discussed about which features they liked, which ones they would like to change and which new they would like to implement. The last phase of the Future Workshop and especially the work on the prototype led to the exact specifications of the application. At the end of the prototype we concluded to a comprehensive evaluation and wrote down the characteristics that were improved according to the employees.

10.1.1 Method of evaluation: Co-Discovery Exploration

In 1996 Kemp and van Gelderen introduced the Co-Discovery Exploration method to evaluate a particular product. The initial idea was that if someone wants to understand how consumers evaluate a product he/she has to look all the way that led them from the start to the purchase of it. For the evaluation during the use of the product, Kemp and van Gelderen emphasize to the following three characteristics during the use of the product: 1) if it (the product) can be operated with minimum effort (Efficiency), 2) if even after a period of time it is still easy to use (Convenience) and 3) if it meets
consumer’s needs (*Functionality*). In 2003 Patrick Jordan (pp.124-125) included Co-Discovery Exploration in a presentation of a number of methods for evaluation of design concepts.

According to Jordan (2003, p.124) the method involves two participants who are exploring a concept or a product. An investigator sits together with the participants and keeps notes of their verbal comments as they are working on the concept/product. The idea is to analyze these comments as they reflect their feelings, experience and opinion about the product. The investigator may work together with the participants giving instructions and answering questions during the use of the product or asking question to the participants about what they are experiencing and how they are feeling while working. Another action of the investigator may be to give certain instructions to the participants about what to do and then watch and write down their reactions while doing it.

### 10.1.2 Suitability of the method

The method requires two participants who are working on the product and one investigator to help or guide them and write down their discussion about it (Jordan, 2003, p.124). During prototyping method the two employees and me had six live meetings to test and evaluate the application. At these meetings the employees worked on the application and expressed their opinions weather the improvements so far met their visualization and needs. I helped them on how to use the new features. They worked on them, we (employees and me) discussed weather the implementations were satisfactory, if they needed minor changes and which new features they would like to implement. At this phase the role of the employees can be identified as the role of the participants who work on the product and my role can be identified as the role of the investigator who helps them and keeps notes of their conversations.

Allaboutux.org (2017) maintains a website that provides information about user experience evaluation methods of products. It includes Co-Discovery Experience as one of them. It states that it is suitable for qualitative evaluation of PC software products that are being used for a short period of time. This products may be in the status of a functional prototype. These characteristics suit very well to the phase of prototyping when the participants implemented new features, tested and evaluated the Microsoft Excel registry file application for a short period of around two months. The characteristics of the method mentioned here prove that Co-discovery Exploration is fruitful to use for registry file prototype’s evaluation.

### 10.1.3 Appliance and results

At prototyping employees tested and evaluated the application. The discussion during the evaluation revealed their thoughts and propositions about the use of it. The key points of their propositions, together with those formerly stated at critique phase of the Future Workshop, formed the specifications of the final product. After the end of the sixth meeting we had a discussion to explicitly summarize the key points at which the
employees felt the application was improved. These key points are directly related to the *Convenience, Efficiency* and *Functionality* characteristics that were aforementioned. They are shown in the next table and analyzed in the next paragraphs:

<table>
<thead>
<tr>
<th>Improved key points</th>
</tr>
</thead>
<tbody>
<tr>
<td>• More user friendly interface</td>
</tr>
<tr>
<td>• Quicker accomplishment of certain tasks</td>
</tr>
<tr>
<td>• Less people to accomplish tasks</td>
</tr>
<tr>
<td>• More information provided</td>
</tr>
</tbody>
</table>

*Table 10.1* Key points of the registry file application that were improved according to the employees

**More user friendly interface**
- The information for members and volunteers group consists of different field. The mixture of them in the old application caused confusion to the user who was inserting data and difficulty when tried to retrieve data. The information about each groups was moved to separated sheets.
- The first three columns on the left are now static when the user moves the sheet to the right to see non-visible data. It helps him/her not to mismatch member/volunteer and his/her information.
- Relevant fields (e.g. those regarding residency or family status) are put together.
- The user may choose values from lists.
- There is color coding in cells about the renewal of registration for quick visual recognition.
- There is data validation for certain fields to avoid wrong inputs.

**Quicker accomplishment of certain tasks**
- The data are now inserted in a table and it is quicker to apply filters for searching/sorting.
- There is an implementation of pies for creating statistics. The user may have statistics of the latest data for certain values (e.g. members per home country) in less than 10 seconds. The only action he/she has to do is to click on a button to renew the data and all statistics are produced at once.

**Less people to accomplish tasks**
- In the old application there was no implementation to produce statistics. Most of the times two employees were being appointed to accomplish this. One was retrieving the data and the other was calculating the sums and creating pies about them. Now statistics are produced almost automatically as written before.

**More information provided**
- The information stored for each member/volunteer now includes about 25% more fields compared to the old application.
10.1.4 Summary

According to the above evaluation the prototype registry was indeed an improvement of the old registry application in terms of user friendliness, less time needed and less people involved for the same tasks, and more information provided. This is a proof that the outcome of the co-design process reflects the vision and expectations of the coordinators who actively participated in its implementation. The prototype application has now replaced the old registry file and it is in use by NCR’s employees (see Appendix J – Statement by NCR). This in turn proves that the appliance of the PD methodology concluded to a feasible intervention in NCR’s workplace and permits to proceed to the next step which is the evaluation of the PD appliance itself so as to finally answer the research question.

10.2 Evaluating the study

Clay Spinuzzi (2005) introduces a set of criteria to assess the quality and success of a Participatory Design project. He states that each PD project by definition involves both research and design processes. According to him each study has to comply with three criteria in order to be consistent with the PD methodology and have internal integrity otherwise there is danger to make a study that looks like one but it is not (p.169). The criteria are consisted by two or more requirements each. Next, I am presenting these criteria and evaluating the present study by discussing how successful their appliance has been.

Besides the qualitative evaluation I am attempting a quantification of it so as to have one more point of view that will hopefully help the reader to understand better the degree of success of this study. The quantification is done using a four scale adjective evaluation followed by a metric (numeric weight):

<table>
<thead>
<tr>
<th>Adjective</th>
<th>Not applied</th>
<th>Poorly applied</th>
<th>Mostly applied</th>
<th>Fully applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 10.2 Quantified evaluation metrics

For each requirement I discuss and justify how much it was applied in the study. At the end of it I append one adjective evaluation with the corresponding numeric one that I believe best matches the qualitative evaluation.

10.2.1 Criterion #1: Quality of life with workers

According to Spinuzzi (2005, pp.169-170) most designers point to this criterion as the most important one. Among others, it stands for the fact that PD aims at making the performance of a given task easier for the workers, who critically reflect on the final product based on their own experience, organization and values. There are two requirements to meet in order to fully apply this criterion:
**Reflexivity and agreement:** workers and designer interact through the methods and work closely together to assess the activities and have a mutual interpretation of the facts under investigation. All methods chosen to be contacted as described in chapter 6. Methods are of those which forward engagement of the people who are affected by the changes of the research and design processes. As mentioned, many authors write about these methods to be among the most important used in PD (Bødker et al., 2004; Spinuzzi, 2005; Brandt et al., 2012; van der Velden and Mörtberg, 2015). During the first two methods (Interview and Future Workshop), and especially the second one, the coordinators were encouraged to have a voice with the help of the researcher. All methods were open for immersing, debating and finally creating a mutually agreed outcome on the fields inquired.

There was a special attention given in having at least one assessment at the end of each method so as to avoid misunderstandings or diverse viewpoints in certain areas. For example, the transcription of the interview was sent by e-mail to the coordinators so as to make corrections or fill in information left out by the researcher. Indeed, there were some areas that had to be clarified and two points that were wrongly interpreted and transcribed by me. The coordinators made the corrections and sent them back. During the Future Workshop, I made efforts to provide coordination and encouragement and to leave coordinators, as much as possible, to express their own needs, wishes and viewpoints without interfering in this part of the workshop.

Prototyping was also a method that the coordinators had the lead to express their will about how they wanted the application to be. I offered my technical background and knowledge so as to come to an application that was as much close to the needs and visions of the employees on the one hand and obtainable by technical terms on the other. This criterion is evaluated to have been fully applied.

*Assessment: Fully applied (3)*

**Codetermination:** the project must be co-determined both by the researcher and the coordinators. In this way the researcher does not own it but gives space for the coordinators to shape it according to their needs, goals and values. As written before, employees and I worked as much as possible together in both research and design phases to co-decide about the problematic situation and the ways to solve it. In fact there was a clear try to have consensus in all decisions. Coordinators were left to express their own needs, feelings and ideas during the workshop. After that, the prototype was based on their own perspective of what the situation should be to become easier for them.

I had been co-working with them mostly to help them transform their ideas and requirements into explicit knowledge. During the methods, the coordinators evaluated at least twice the reports and made corrections and additions. Of course there were limitations in this cooperation that prevented employees and
me to work physically together for more period of time. This lack of physical working together was substituted by other means of cooperation and communication like e-mail service and sharing docs in the cloud (using the Dropbox Internet cloud service). I write in details about the limitations later in this chapter.

Assessment: Fully applied (3)

10.2.2 Criterion #2: Collaborative development

Participants in a PD study are supposed to be co-researchers and co-designers. Doing so, the workers are facilitated to unveil parts of their knowledge and work that in another case would stay invisible. In this way the researcher can make explicit this tacit knowledge and encourage the workers to shape the design and forward their own empowerment. Tacit knowledge often turns out to be invisible during the research because people perform their daily activities in ways that often cannot be observed. These ways PD methodology is aiming to shape productively (Spinuzzi, 2005, p.163). Collaboration is a key to ensure that data collection and analysis in an effort to improve quality of work-life is conducted by all participants in conjunction (Spinuzzi, 2005, p.170). There are four requirements to meet in order to fully apply this criterion:

- **Involvement**: a PD study must provide methods for genuine participation of the workers and not only listen to them. Researcher should not only write down their opinions and then draw outside the group and design a solution as he/she thought it should be. The group has to interact and workers’ concerns have to define the requirements and shape the solution. In Criterion #1 it has been repetitively mentioned that coordinators worked together with me during the methods of the PD study. They had the lead to express their experiences, concerns and wishes about their work. They decided what was the main problematic situation to deal with and how they visualized an improved version of it.

They shaped the prototype application during a number of six meetings where they had the opportunity to work on it, to tell what more they would like the app to provide and what modifications they would like to have at the prototype in its form until then. We conducted an iterative evaluation that lasted six cycles where the coordinators had the chance to perform the Tell-Make-Enact cycle that was mentioned in section 6.3 Prototyping (see Figure 6.2). The main role of the researcher-designer in prototyping had been to support the employees with the needed technical know-how to help them move from visualization of the solution to feasible specifications and of course with the implementation of the prototype.

Assessment: Fully Applied (3)

- **Mechanisms for consensus/agreement and representation**: In most cases it is impossible for all people affected by the design outcome to participate in the design process. For this, they must be represented in the process so that people
with different interests will be able to affect and shape the study. This is analogous to the way elected politicians represent the citizens who vote for them in the parliament. Unfortunately, in this study this factor was barely fulfilled.

As seen in sector 3.3.3 NCR’s circles of involvement employees and volunteers of the organization are in the core of the design process. They are supposed to be the primary group of stakeholders that should be engaged and participate in the study as they are those who are affected directly by it. Children and their parents are in the periphery. Only a small group of the employees – coordinators – and none of the volunteers participated in the study. No children or parents participated also.

Next, I group the stakeholders of the core and periphery circles of involvement for the NCR into detailed groups and I write for each if it participated or not in the study. For each one that didn’t, I explain the reasons:

1. Administrative board: The contact with the administrative board was made indirectly through the coordinators. The board was informed about this study with a letter for approval (see Appendix A – Application letter to Administrative Board of “Network for children’s rights”) during a weekly meeting. The members gave the permission to conduct the study. They were asked if we could arrange a meeting for a face-to-face discussion about the study and for an invitation to participate. This meeting was never arranged. In section 3.2.5 Limitations I explain that the members have other professions and they are involved in the NCR during their free time. That made very much difficult for them to spend even more of their free time for this study.

2. Children: children are the members whom NCR has been formed to serve. It was clearly stated from the beginning of the study that children were excluded from it because of the strict legislation demands. To have children participate we needed to have permission by custodians and also their physical presence during the research. The coordinators evaluated that this would take a lot of time and communication to achieve in the first place, and that in practice there would be much danger for canceling meetings with children and their custodians.

3. Parents: it includes the parents or, in some cases where there are no parents alive or in the country, the custodians of the children members. They were not involved in the study because coordinators from their own experience believed that it would be difficult to find parents that would be willing, had the time and would not cause cancellations in meetings so as to participate.

4. Coordinators: they are employees of the NCR who are supervising and organizing the structures. There are four coordinators. Two of them actively participated in the processes.

5. Administrative employees: employees who administratively support the organization (e.g. accountants). Most of them are part time workers. Their work has no direct connection to the children members. Coordinators suggested to be
left out of the study for two reasons: 1) they don’t come to the NCR on regular basis every day so they would make harder to schedule the meetings, 2) it was presumed that they would not be affected by the outcome of the research.

6. Social support employees: they are psychologists and social workers who offer support to children, parents and families who need it. They work in a different location (see Appendix C – Detailed Presentation of NCR’s structure) and they also work in specific days of the week mostly during scheduled appointments. They also work in other organizations. The coordinators suggested that it would be a problem to schedule meetings with them because of difference at times being at work and of being very busy with appointments.

7. Volunteers: they are a group that constantly changes even monthly. They are important for NCR’s operation. Their presence in organization’s places is random and is mostly based on events scheduled each time. There are several volunteers who run long-term projects. However the majority of the volunteers is changing yearly because the educational, professional or marital status of these people change also and so it directly affects the way they participate in the organization. There are cases where volunteers who run the same long-term project are being substituted twice or three times during the same school year because for several reasons they can no longer be part of it. This group was not represented also.

Assessment: Poorly Applied (1)

◆ Common language games: workers and researchers should use a common “neutral” language to communicate and understand each other. The researcher must ensure that users are able and comfortable to use this language so as to critique the processes and express their ideas and solutions. There are tools that can be used for this purpose such as PICTIVE’s pictures or work diagrams. During the study there was a great effort to have collaboration, mutual understanding and consensus. Coordinators after each method had the opportunity to change, add and clarify things by evaluating the reports. This kind of evaluation took place twice for the Interview and Future Workshop and six time for the Prototype. Notes, sketches and diagrams were written down and substantially approved by all participants. However, no specific tool, like those mentioned above, was used to ease or further forward the mutual understanding of the things said and done.

Assessment: Poorly Applied (1)

◆ Common aims: Workers and researcher need to set a number of mutual aims at the beginning of the project which represent the interests of the first ones. These are a subject of critique throughout the whole process and may be altered according to the progress of the study. The aims of this research were discussed and agreed upon at the beginning. Before starting, I and the coordinators had a meeting where the latter were introduced to the methodology, methods and desirable goals of this study and they we discussed about possible outcomes that would interest and benefit them. The conclusion (aims) of this discussion were imprinted onto two documents: 1) the information for consent (see Appendix B -
Information for research participants / Consent form) and 2) the approval letter (see Appendix A – Application letter to Administrative Board of “Network for children’s rights”)

While the work was in progress, these aims became much more specific and transformed to requirements and at last to specifications. This happened at the end of the Future Workshop. Moving on to the design process, the specifications transformed to a working prototype application that had been the outcome of the try by the participants to make real what they had set as aims at the beginning of the study, aims which were set in common.

Assessment: Fully Applied (3)

10.2.3 Criterion #3: Iterative processes

Just collecting workers’ comments or responses for a number of aspects during the PD study like the prototype leads to caricature of the conduct of methodology. To have genuine participation and give workers the ability to respond, comment and critique effectively we need to do that iteratively. This way the researcher can extract the experience of the work practices and other kinds of tacit knowledge that the workers possess and is very valuable for the research and design but it is very hard to extract and transcribe (Spinuzzi, 2005, pp.170-171). There are three requirements to meet in order to fully apply this criterion:

◆ Continual participation: participants must be involved in the process in all duration of it. This involvement requires repetitive steps where participants will be able to reflect and reevaluate the progress. Discussing the two criteria above we described how the employees were given the ability to participate in the process with the use of the PD methods and to assess multiple times the outcomes of each one of them. Especially this requirement together with Involvement (Criterion #1) ensure consistency with the Participation, the first core element of PD (see section 4.3 The Core Elements of PD). For the first two methods (Interview, Future Workshop) the assessment took place after the end of them and it was repeated twice.

For the third method (Prototyping) the assessment was an ongoing process. There were six meetings where the coordinators had the opportunity to reflect on the prototype application, make comments and suggest modifications and additions. Indeed, there were many changes and additions at the application before the final form of it. There were times when coordinators asked for changes over the changes they had proposed in earlier meetings (e.g. the order of the fields of information for members). Even in the early stages of the study employees co-decided about aspects like the form of the Information for Consent paper and of the Application for approval letter.

Assessment: Fully Applied (3)
**Revisiting stages**: It is rare and difficult to get all the information and extract all tacit knowledge possible at the end of each method. A successful PD study must be the one that is flexible enough to revisit prior stages iteratively and cyclically so as to enrich the existing or gather new information. In this study there were times when we went back to prior methods to enrich or clarify information. This was done both in Interview and Future Workshop methods. Mostly in Interview method, I strove to learn from the coordinators about the organization, its operation and its structure. This was a difficult task since I had no prior in depth knowledge about NGOs.

There were many times when I had to go back to the Interview section and ask for clarifications or more information regarding the administrative structure of the organization. After these revisits the report about this section was enriched. Twice the participants went back to the Future Workshop method to refine the requirements. However, even if there were revisits to prior sections when needed, no specific mechanism was set to force an iterative and cyclical rework of the methods. The revisits were forced by necessity rather than predefined intention.

*Assessment: Mostly Applied (2)*

**Sustained reflection**: There is a danger, especially during the later stages of a project – e.g. during prototyping – the employees to focus on minor details rather than reflecting on the whole process. This decreases their involvement and their influence on the final outcome. On the contrary, they must be continuously encouraged to critically reflect on the implication of the final product for making their work life better. This requirement especially guide us to be consistent with *Design Process*, the fourth core element of the PD methodology (see section 4.3 Core Elements of PD).

It has been stated several times above, that there was a great effort to encourage the employees to participate, co-design and reflect on the whole process, even at the end of it. This was accomplished at a great degree. I will use the following fact as evidence to support this statement. For evaluating and reflecting on the prototype application six meetings took place. Normally someone would expect that in the last one or two meeting the coordinators would just affirm that the application is consistent with their visualization and needs. On the contrary, in the last two meetings they asked to redesign the statistical graphs in the application.

Following the *Telling-Making-Enacting* cycle (see chapter 6. *Methods*) coordinators working on the prototype and looking at the way it functions decided that it would be more helpful for their work to have statistical graphs in a different form. They asked for redesigning the graphs to be in pie rather than in column style. The critique and need for this change was that firstly, according to their experience, pies are easier to explain to an audience when doing a
presentation and secondly it is easier for a reader to understand when used in a report or a proposal.

Critically standing before the above statement I can argue that this effort for sustained reflection could have been more intense. As Bødker and Iversen (2002, p.17) suggest, reflection is crucial for both the PD itself and the progression of the ongoing design project. For example, I could have worked at the same physical location together with the coordinators so as to have direct interaction, cooperation and communication with them. On the other hand this practice could have had negatively affected other factors.

Coordinators had an already heavy daily schedule at work. To be available for this kind of cooperation they should had had to find more hours for the study to fit in their daily working program. This would had made much more difficult to arrange meetings and could had potentially led to postpones. In any case, what must be underlined is that there was potential space to further forward more sustainable reflection.

Assessment: Mostly Applied (2)

10.2.4 Evaluation table

Having discussed this study based on the three criteria set by Spinuzzi (2005), I am going to depict the evaluation. For the depiction a table is used where the requirements to meet the criteria and the quantified evaluation for each one of them are presented. The scope is to have a visualization of the evaluation and a metric to have a quick view of the level of success.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Requirement</th>
<th>Evaluation</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Quality of life for workers</td>
<td>1. Reflexivity and agreement</td>
<td>Fully applied</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2. Codetermination</td>
<td>Fully applied</td>
<td>3</td>
</tr>
<tr>
<td>#2 Collaborative development</td>
<td>1. Involvement</td>
<td>Fully applied</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2. Mechanisms for consensus/agreement and representation</td>
<td>Poorly applied</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3. Common language games</td>
<td>Poorly applied</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4. Common aims</td>
<td>Fully applied</td>
<td>3</td>
</tr>
<tr>
<td>#3 Iterative process</td>
<td>1. Continual participation</td>
<td>Fully applied</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2. Revisiting stages</td>
<td>Mostly applied</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3. Sustained reflection</td>
<td>Mostly applied</td>
<td>2</td>
</tr>
<tr>
<td>Sum of metrics</td>
<td></td>
<td>21 out of 27</td>
<td></td>
</tr>
<tr>
<td>Percentage of success</td>
<td></td>
<td>77.8%</td>
<td></td>
</tr>
</tbody>
</table>

Table 10.3 Concentrating evaluation table
On Table 10.3 besides the concentrated and quantified depiction of the evaluation, I sum up the metrics for each requirement and I compare it to the maximum sum of metrics that I would achieve in a fully successful PD study. The sum of metrics achieved is 21. The maximum sum that could be achieved is 27 (9 requirements x 3 metrics when each one fully applied = 27 maximum sum). Final score is 21 out of 27. If this transformed in percentage we come to an outcome that this study is by 77.8% successful.

10.3 More aspects for discussion

10.3.1 Mutual learning

In section 4.3 Core Elements of PD, I discussed about the four core elements of PD methodology: participation, mutual learning, practice and design. In section 10.2 Evaluating the Study I analyzed and evaluated the apply of three out of four elements, participation, practice and design, mostly in Criteria #2 and #3. The second core element, mutual learning, was not explicitly analyzed for this study. I am going to discuss it in this section.

Bratteteig et al. (2012, p.132) argue that one of the distinguishing elements of PD methods is to be committed to and guide how to achieve mutual learning. At the beginning of the study I, mostly during the Interview, strove to inquire and learn about the NCR, its goals, operation, activities and structures. At this stage coordinators shared with me their knowledge and experiences about the organization together with extra resources for information such us web-site links, organization structure graphs etc.

At that time, it is obvious that I was learning from the employees about the organization itself and other relative information like how NGOs operate, which are the most important problems children face in contemporary Greek society, which are the children’s right that are being violated the most today and so on. This was an extremely important process that helped me understand the working, social, financial and legal context inside which the employees are fulfilling their every day tasks. This has been a base for applying the PD methodology in the specific organization.

On the other hand, I tried to share my knowledge and my experience with the coordinators to conduct and support as successfully as possible, the selected methods to carry on the research and design processes. First of all I tried to share information about the methodology, a brief historical and philosophical background, its selected methods, which the goals and the requirements to achieve were. During the methods I strove to be consistent with the methodology as well as supportive and encouraging. Coming to the design process, another very important issue the participants faced was the technical aspects of the prototype application.

Supporting my role as an IT professional, I was responsible to explain technical possibilities and restrictions of the application so as together with the coordinators to
shape the prototype. I shared my knowledge with them in order to achieve a possible outcome that fitted their visualization and needs. In this stage I came before the challenge of how much knowledge I should share or better I should burden the coordinators with in order not to negatively affect the process. On the one hand, I willed to be a facilitator in the process rather than a educator to teach the coordinators all the technical aspects of the application.

On the other hand, coordinators should definitely learn some of these technical aspects for two reasons. The first one was because they should be aware for the major, at least, reasons why something was possible or not and why something could not be done in a certain way and should be implemented differently. The second one was because after the end of the study it would be beneficial for them to have gotten to know better the use of the application for their tasks as much as to have earned some new skills and competencies for themselves. The golden section was found somewhere in the middle and it was found in the progress of the design. We may conclude that the mutual learning of PD was applied in this study.

10.3.2 Criteria weights

In the previous section all the requirements of the criteria I used to evaluate the study have the same weight. This means that they are taken of equal significance for the final assessment of the study as Spinuzzi (2005) himself does not differentiate them in his work. However we can discuss about differentiate the weight of each one since through this study I came up to the personal view that some requirements are more important than others or the context of some of them is similar to others.

In specific, Codetermination in Criterion #1: Quality of life for workers and Common aims in Criterion #2: Collaborative development have similar context since both are dealing with the necessity for all participants to work together in the research and design processes and co-decide about common aims. Sustained reflections in Criterion #3: Iterative process can be seen as part of the Continual participation in the same criterion since the latter cannot be implemented if the the first is missed.

Common language games in Criterion #2: Collaborative development even if it is significant for the mutual communication and understanding among the participants, does not seem to be so important compared to the other requirements of the same criterion. It is more crucial to have as much participants of the organization as possible (Mechanisms for consensus/ agreement and representation in Criterion #2) involved (Involvement in Criterion #2) than trying to establish Common Language Games because if there is very small participation or the participants are not really involved in the research and design processes there is not consistency with PD’s Core Elements (see section 4.3 Core Elements of PD).

Criterion #1 Quality of life for workers requires mutual understanding to agree and co-determine the goals. This requires a mutual understanding since in the opposite case these requirements cannot be fulfilled. Common Language Games come to strengthen
mutual understanding but the lack of this requirement does not mean the lack of mutual understanding. As a conclusion it seems valid to apply different weights to the requirements when we attempt to evaluate a PD project since the lack of fulfilling some requirements seem more significant than others. If we do so, the issue of which value each weight should have arises. This can be the topic of a new discussion but it is out of the scope of this section.

10.3.3 Having a voice in Interview

As stated in section 6.1 Interview, the interviewees were two of the coordinators of the NCR. Besides the critical problem that there was very limited representation of the stakeholders, there is another one that comes up and ought to be discussed. The decision not to have individual interviews was taken mostly because the coordinators had big workload and did not have much free time for separate interviews. This may bring the interview up to an unwanted situation where one coordinator takes the lead of the conversation keeping the other with little or no participation.

Another possible disadvantage may be that one coordinator does not genuinely express his/herself because he/she feels pressure or discomfortability when the other is present. Both disadvantages lead to suppression of the right to have a voice that it is crucial when every participant should be engaged in the process. I felt that I tried to have a friendly conversation and be encouraging to the coordinators to help them express themselves when I took the interview. However I did not use any special technique to ensure that both interviewees would have the same opportunity to have a voice. Probably separate interviews are more preferable to deal with this issue.

10.3.4 Increasing productivity

As seen in section 8.2 Realization phase of Future Workshop, participants defined the old registry file, in the way it was developed and used, problematic because, according to the specifications they set, information for member children should be separated from this of volunteers, the fields used should be altered or new needed to be added, the way data were inserted should be redesigned and graphical statistics needed to be added. There were tasks that could be done automatically but the old registry file did not support this functionality. All kinds of statistics were produced manually.

All the above created a problematic situation when the participants had to use the old registry file to perform tasks. In terms of productivity this means that the organization should spend more resources (number of employees, work-time of employees) for certain tasks. For example, to create statistics in graphical forms at least one coordinator, sometimes with the help of another one or of a volunteer, was needed to manually retrieve numbers from the old registry file and then use the same application (Microsoft Excel) to insert these data and produce a graph. Using the new registry file this is done almost instantly because of the embedded graphical statistics that have been inserted.
In Appendix G - *More figures of the prototype application* reader can see four graphs that provide visualization of certain statistics that can be used to provide information for the Administrative Board’s meetings or create proposals and presentations. New fields’ design and data insert functionality make the way coordinators use the registry file easier (see section 9.3 *Prototype application*). This results in an increase in productivity of the coordinators in terms that they need less time or less employees to perform the same tasks. In certain cases, such as creating graphs, only one person can perform the same task almost instantly. These mean more time and people for other tasks and less effort and stress for the coordinators in their working life for tasks related to the registry file (see section 10.1 *Evaluating the application*).

10.4 Critical reflections

This study, as stated in chapter 5. *Research Paradigm*, follows the critical paradigm. According to Orlikowski and Baroudi (1991, p.6) a research can be classified as critical when a stance is taken to critique the situation about the organization and information system inside the current social system and structural contradictions it is exposed. In this section the elements of a critical research that were reflected in this study follow. Before moving to this, the reader needs to be aware of the small scale of the study in terms of the short time taken to be completed (about five months), the small number of participants and the inability to watch the long-terms consequences upon the direct and indirect stakeholder.

10.4.1 NGOs: an institution to improve social conditions

NGOs are typically great supporters for a state that try to increase the provision of social goods to people who are in need. However, nowadays in Greece the NGOs come to fill a gap that leaves the absence of the state in basic social services. In other words, the NGOs are substituting the government in certain areas such as food, clothing, health and medical supplies, education and entertainment. There are NGOs that have exclusively undertaken the sheltering and care of refugees under the surveillance of the Greek government.

Establishing or engaging in a NGO is mainly based on the values of humanity, solidarity and caring that people, who wish to help others in need, have. Each NGO may serve similar or diverse goals. The goals are defined by the people who are engaged in and depend on their personal experiences, professions, specialties, dreams and other factors. As stated in section 3.1 *Scope of the study* to answer the research question a PD study in NCR took place that would result to help its people provide better services to children and their parents.
10.4.2 Transformation and improvement

10.4.2.1 In individual level

The coordinators are under a lot of pressure at work. One reason is that there is limited funding and it is difficult to employee new personnel to share the work load. One is that even if there is an IS that can support the coordinators the way it is used doesn't seem to give the best possible results. Another one is that the volunteers who are very important in organization's operation come and go very often. This results to an inability to support coordinators in some administrative activities. On the contrary, the change of volunteers at the same job position causes problems at work.

In a short-term evaluation, we see that the use of the application that was co-designed by the participants helps the coordinators to organize in a easier, quicker and more convenient way the information the NCR needs to store for children members and volunteers. By participating in the prototyping method the coordinators became more familiar with the Microsoft Excel application. One benefit is that now they have acquired the necessary knowledge of Microsoft Excel's functionalities to use and extend the prototype application.

Another one is that they are able to train a new user (perhaps a volunteer or a new employee) how to use it. Their participation throughout the whole research and design processes has resulted to a prototype application that makes the work tasks for the registry file easier, as well as to an extension of their knowledge and skills upon the Microsoft Excel application. The latter gives them a degree of power and independence to visualize and create their own new Microsoft Excel tools to make their work easier.

10.4.2.2 In societal level

As stated before, the main goal of the NCR is to protect and support children's rights. For this it organizes activities that help and support children and their families who are in need. The coordinators were the direct stakeholders and unfortunately the only participants from the side of the organization in this study. Their role is to coordinate activities, supervise volunteers and children, and communicate with the other divisions of the NCR. We separated their work into tasks that had to do either with the activities for the children or with the administrative ones. Throughout this study we tried to make the second category easier and less time consuming. This leaves coordinators more time to organize activities for the children and work closer with the volunteers.

Children members are indirect stakeholders who are benefited by the outcome of this co-research and this co-design also. Because this study has been a small-scale one it does not dramatically change the way coordinators work but it brings a small improvement in the way they do their job. It is much probable that more interventions of this kind in the future will have even better results and will eventually lead to a more effective help and support of the marginalized members inside Greek society not only
to survive but to become more independent and emancipated (Brocklesby and Cummings, 1996) mostly through educational activities also.

10.5 Answering the Research Question

In section 1.4 Research Question of the Study the research question attempted to be answered through this PD study was introduced. After conducting the research and design processes, gathering and analyzing the data, and discussing and evaluating the empirical findings it is time to attempt to critically answer it.

RQ “Which major obstacles may come up when doing a Participatory Design study in a Non Governmental Organization?”

Looking at Table 10.3 Concentrating evaluation table it is clear that at this project we faced two major obstacles. They are both related to Criterion #2 Collaborative Development. The first one is that a mechanism for representation of all stakeholders in the project nearly failed to be applied. In section 10.2.2 Criterion #2: Collaborative Development I identified six different groups based on the organizational structure of the NCR. For the reasons analyzed in this section only one group had representatives in the study. All other groups did not have the possibility to be involved, express their needs, feelings, ideas and reflections on the outcome.

Someone may argue that the other groups were going to be very little or not at all affected by the outcome by the way this was finally decided and shaped, or may disagree with the basis for identifying the groups. However, these are not the issues that I am focusing on in this critical reflection. Involving as many stakeholders as possible even through representatives is a key issue in PD methodology. This is a crucial requirement to successfully apply more or less all four core elements described in section 4.3 The Core Element of PD.

The failure to achieve maximum representation in a PD study is not rare. In section 2.2 IS Implementation Failures I refer to examples where certain stakeholders either did not participate genuinely or not at all, or became barriers for a project. Kensing and Blomberg (1998, p.173) point out that in many PD projects it is not possible for all stakeholders to participate. In these cases researchers or workers alternatively identify participants. The challenge that comes up in this situation is to find ways to ensure that the maximum number of groups of stakeholders will be represented in the process.

The second obstacle faced has been the lack of Collaborative Language Games. Although there were no incidents of lack of communication or even misunderstandings among the participants, Spinuzzi (2005, p.170) supports that it is important to have planned for mechanism that will ensure mutual understanding between all the stakeholders. In this project the fact that communication had been fluent and without problems was a consequence of a number of factors that are not to be discussed here. It is very probable that in other projects, similar of different compared to this,
communication may be easily turned out to be problematic and the collaborative language games will come to solve this.

Based on the literature review (Chapter 2), the detailed presentation of PD methodology (Chapter 4) and the discussion (see section 10.2.3 Criterion#2: Collaborative development) we conclude that these two obstacles are not of the same significance for the conduct of a PD study. The very small representation of the stakeholder appears to be more significant that the lack of collaborative language games. This is argued for three reasons: 1. participation is a core element of PD, so failing to ensure participation means that a core element of the methodology is missed, 2. there are a lot of examples that describe failure of IS implementations because of the failure to ensure participation of the stakeholders but we don’t find information about the impact of the lack of collaborative languages, and 3. in discussion is already stated that the requirement of collaborative languages was not found of equal importance related to the other requirements.

Short answer: “Major obstacles that may come up when doing a Participatory Design study in a Non Governmental Organization are:

- the very small representation of all the stakeholders that should participate in,
- the lack of planning collaborative language games to prevent possible problem of mutual understanding among the participants.

The first obstacle is considered to be more significant than the second one.”
11. Conclusions

In this chapter I present a brief overview of the case and outcomes of this study. I write about how it can contribute in the research at the IS field, how we (participants) continue after the end of it and which parts a researcher may find fruitful to be based on for further studies.

This study aimed to seek for major obstacles that may come up when a researcher uses PD within an NGO to achieve feasible interventions in its workplace. For this scope a critical, qualitative PD study was conducted at the NCR to design feasible intervention together with its employees and help them improve the way of accomplishing work tasks. The research and design processes took place with the active participation of the coordinators and concluded at a prototype application, a registry file where the information of children members and volunteers are stored. This application comes to improve a problematic situation that has incommoded the users of NCR for about five years. As a consequence, the coordinators will be able to dedicate more time and energy to other, more important for the organization, activities for the benefit of the children in terms of services the latter get by the NCR.

Evaluation of the design outcome as well as the whole process revealed barriers that came up. The evaluation of the PD study at the NCR, based on the three criteria Spinuzzi (2005) set for this purpose, led to the conclusion that the major obstacles have been the lack of representation of most of the stakeholders’ groups that should participate and the absence of predefined communication language games to ensure a certain minimum level of understanding among the participants, with the first obstacle being more significant than the second one. This outcome may help the researchers in future projects to pay extra attention at these obstacles so as to confront them as well as to search for methods or techniques to minimize the possibility to appear.

11.1 Contribution of the study

The conduct of this study contributes in the following ways:

1. The practical evaluation of this PD study in the Network for Children’s Rights NGO based on Spinuzzi’s work (2005) provides an overview of potential obstacles researchers may generally face in other similar project.

2. It provides information and empirical data in applying Participatory Design to improve the working tasks in non governmental organizations. As presented in section 2.5 PD Applications in Non Governmental Organization there is limited research done in using PD within NGOs to make changes in their working routines or tasks. Research and design took place in a Greek NGO but its findings may be used as basis or theoretical part of a research in similar NGOs in other states as well.

3. The prototype application, which is the result of the participative design, helped the NCR coordinators to improve a problematic situation (see Appendix J – Statement by NCR) they have been dealing with for about five years (since 2012). Furthermore, the new form of this application provides them with new
tools that support them in a number of other tasks like making reports, presentations or proposals that include statistical information about the children members of the organization.

11.2 Next steps after the study

In this paper the research and design processes following the PD methodology, as well as its evaluation were described. However the effort of the participants (coordinators and me) to make feasible interventions does not end here. The next steps planned are the collaborative transfer of data from the old registry file to the new one, as well as the solution of potential problems that may appear in the operation of the application and the creation of new functionalities if needed. Following PD principles, we can always find space for improvements to support employees’ work-life. So we keep an open mind for more tries to solve other problematic situations by applying PD methodology as well. As Carroll and Rosson (2007, p.258) state, a chief challenge of the PD is to create a process of continuous learning that is sustainable and self-directed.

11.3 Further research

The answer to the research question provides a fine opportunity to further research ways (methods or mechanisms) that will hand over tools to the researchers for applying more successfully the PD methodology, avoiding the obstacles we faced in this study. One topic may be the inquiry for methods that will provide a framework to engage as many stakeholders or representatives of groups of stakeholders in the research and design processes as we can. Another topic may be the investigation of existing or the creation of new collaborative language games that will help researchers to ensure a minimum level of understanding among the participants. The effort to overcome the obstacles that came up will result in a more successful appliance of all PD core elements in future NGO projects.
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Appendix A – Application letter to Administrative Board of “Network for children’s rights”

To: Administrative Board of “Network for children’s rights”
Non Governmental Organization

Title: “Application for approving research conduct”

Honorable Ladies and Gentlemen,

my name is Emmanouil Syrengelas and I’m student in “Information Systems” master program that is held at Linnaeus University in Växjö, Sweden (http://www.lnu.se). I’m contacting you because at this period of time I am registered to accomplish my master thesis for the program and I wish to conduct my assignment at “Network for children’s rights” non governmental organization. My wish primarily comes out of my personal relations with Thomas Chiotis, who voluntarily supports organization’s website, and Foteini Avdelli, who is coordinator in “Culture Lab”.

A. Goal of master thesis assignment

Goal of each master thesis is the student to perform theories, methodologies and techniques that he/she has learned during program’s courses so as to successfully conduct a research, according to the criteria set in course syllabus. The vision of my own research proposal is double:
1. to conduct a research using a methodology called “Participatory Design”, which, according to Greek bibliography, is not widely performed in Greek academic research field,
2. this research and the design process that follows to hopefully create feasible and sustainable change(s) that will help organization’s employees and volunteers to perform some of their everyday tasks-routines better.

B. Methodology

Methodology that is going to be followed is called “Participatory Design”. It comes from Scandinavian academic and political tradition and has its roots back in 70’s. Its acceptance and application is spreading widely through time in global academic community. A world academic conference is held every year in different parts of the world to forward methodology’s evolution and documentation.

Central notion of this methodology is participation. The specialized researcher who is undertaking to conduct research and design in an organization is no longer “the expert” who has the final word in decisions taken. He/She rather has the role of cooperator-facilitator-emancipator who is sharing his/her knowledge and skills to co-research and co-design, together with the people of the organization, a solution to deal with a problematic situation. Significant notions of the methodology are:
• **Participation**
The most important condition is the active, voluntarily and spontaneous participation of the people who are directly or indirectly affected by the problematic situation under inquiry. “Participatory Design” is forwarding active engagement and equality during all inquiry, design and decision processes.

• **Human not user**
“Participatory Design” is not facing participants as users – people who are mechanically perform tasks-routines – but as humans. It acknowledges that every person has his/her own opinion, viewpoint, moral values, knowledge and skills that directly affects the way he/she performs everyday work. “Participatory Design” is a value-centered approach that places these factors in the center of the research and design processes. A solution correctly based on technical methodologies may fail because it has not taken under consideration critical human and social factors.

• **Mutual Learning**
All participants are sharing their knowledge and skills during the common effort of research and design. In this way everyone is benefited by gaining new knowledge and probably new skills by others. Researcher needs to learn about the goals of the organization, its structure, its infrastructure, its activities and tasks as much as personal experiences, viewpoints, emotions and needs. This is done through knowledge sharing by the personnel of the organization. On the other hand, researcher shares his/her own technical expertise, and methodology and methods knowledge with the participants to help them design the most possible fruitful way to improve a situation.

**C. Scope of current research**
Scope of the current research is researcher together with personnel of “Network for children’s rights” to search, inquiry and map in details situations in the organization that they find to be problematic. Then they will seek for and design solutions that they evaluate to be feasible and sustainable to improve these situations. These actions will be done according to the principles and methods of “Participatory Methodology”. Who is going to participate in this research and on which aspects of organization’s operation the research will focus is upon people of the NCR to decide. No situations to focus on are predetermined. This is for the participants to decide during the research.

• **Requirements**
Participants need to be in contact at least once a week so as to schedule the meetings to perform the activities of inquiry, decisions and design of changes to forward, give additional information and clarifications to the researcher if needed, evaluate or give feedback as a follow-up after performed activities. At least two face-to-face meetings will take place inside or outside organization’s workplace. Those that are going to be held inside the workplace will need to take place during working hours so as employees will help the researcher to gain in depth
understanding of organization’s activities and work tasks. This cannot be omitted otherwise the research methods won’t have the desirable outcomes. In any case there will be all possible efforts to cause the less possible inconvenience and disruption in daily operations.

- Advantages for “Network for children’s rights” organization

Main motivation and goal of this research is to be beneficial for organization’s operation. Inquiry and design of changes in the way employees are performing their tasks intend to create a better working environment to help perform task in a way that matches better their needs and will.

D. Dealing with data and confidentiality

All data that are defined as private and sensitive by domestic laws (law 2472/1997 etc.) and legislation will not be published by any means, oral or written. Data that employees will decide that they do not want to be published for any reason will not be published also. Researcher is responsible to keep all data that come from the conduct of this research in any means (oral, notes, writings, photos, documentation, audio/video recordings) safe under his possession. All data that are going to be published by the researcher will firstly become available to the employees to have their consent.

In case any employee feels that confidentiality of data is compromised in any way, is encouraged to explicitly state it. Compromise of confidential data is critical issue that if happens must be resolved before researcher proceeds to any kind of publication.

E. Information about the process and results of the research

All participants have the right to freely access information gained during the research. This information may regard any part of the research and may be in any kind of form: notes, writings, photos, documentation, audio/video recordings. Information that is stated as private or sensitive by its owner is explicitly excluded from free access by others. Researcher is responsible to keep all information under his ownership. A digital copy of the final master thesis paper will be publicly available.

F. Voluntarism

All persons will be voluntarily participating in this research. Any person has the full right to withdraw from participation any time during the conduct of the research without the obligation to explain the reason of leaving. At any time of the research all participants have the right to ask for further explanations or changes of the consent regarding storage, manipulation and publication of personal and confidential data.
By acknowledging this brief information about my purposed master thesis assignment to you, I kindly ask for your permission and consent to conduct my research at the “Network for children’s right” non governmental organization. I am available to answer any question arises, and provide with any oral or written clarification or further information about the research.

Zografou, 6/12/2016.

With honor,

Emmanouil Syrengelas

Student of Information Systems master program, Department of Informatics, Faculty of Technology Linnaeus University, Växjö, Sweden (http://www.lnu.se)
- Teacher of Informatics
2nd Vocational School of Elefsina – Keleos (http://2epal-elefs.att.sch.gr)
- Home address: 12 Gazias st., Zografou, P.C. 15771, Attica, Greece
Phone number: +30 210 770 7710
Mobile number: +30 697 743 9969
E-mail: emsyr@sch.gr
Appendix B – Information for research participants / Consent form

Information for research participants

1. Title of research

Seeking for obstacles to achieve feasible interventions within NGOs with the use of Participatory Design: A study in “Network for children’s rights” Greek NGO.

2. Background and purpose

The research to be contacted is the individual master thesis assignment of the researcher for the Information Systems master program being held in Department of Informatics, Linnaeus University, Växjö, Sweden (http://www.lnu.se). Its scope is to design change(s) in the working environment of the “Network for children's' rights” non governmental organization to help employees in performing their tasks better according to their needs and will. The research is meant to be conducted with the active participation of the employees in all stages so as to help the researcher during the inquiry and co-design desirable and sustainable solutions.

3. Inquiry concerning participation

The choice of “Network for children’s rights” N.G.O. is based upon prior personal relations between the researcher and the employees. One strong motivation for choosing it is, along with the completions of the research, to help organization’s personnel fulfill daily tasks better. In this way it will be able to better serve children that need organization’s support and services.

4. How the research will be conducted

One main goal of the research is to follow methodologies and methods, learned during the course of the master program, in the field. The research will engage stakeholders of the organization in a process of research and design solution to perform everyday tasks better. Researcher and stakeholders are expected to work together as a team. For this, they will be in face-to-face, by phone or by e-mail contact at least once a week. A number of three or four meetings are going to take place in order to perform activities to inquire organizational strategy, activities, infrastructure and tasks. During the last one or two meetings researcher and stakeholders will decide and design changes to face possible problematic situation(s) that will lead to a better working environment.

5. Requirements

Project team needs to be in contact at least once a week so as to schedule the meetings (three or four) to perform the activities of inquiry, decision and design of changes to forward, give additional information and clarifications to the researcher if needed, evaluate or give feedback as a follow-up after performed activities. The meetings will
take place inside and outside organization workplace. Those that are going to be held inside the workplace will need to take place during working hours so as employees will help the research to gain in depth understanding of organization’s activities and work tasks. This cannot be omitted otherwise the research methods won’t have the desirable outcomes. In any case there will be all possible efforts to cause the less possible inconvenience and disruption in daily operations.

6. Advantages

Main motivation and goal of this research is to be beneficial for organization’s operation. Inquiry and design of changes in the way employees are performing their tasks intend to create a better working environment to help perform task in a way that matches better their needs and will.

7. Dealing with data and confidentiality

All data that are defined private and confidential by domestic law and legislation will not be published by any means, oral or written. Data that employees will decide that they do not want to be published for any reason will not be published also. Researcher is responsible to keep all data that come from the conduct of this research in any means (oral, notes, writings, photos, documentation, audio/video recordings) safe under his possession. All data that are going to be published by the researcher will firstly become available to the employees to have their consent. In case any employee feels that confidentiality of data is compromised in any way, is encouraged to explicitly state it. Compromise of confidential data is critical issue that if happens must be resolved before researcher proceeds to any kind of publication.

8. Information about the process and results of the research

All participants have the right to access all information gained during the research. This information may regard any part of the research and may be in any kind of form: notes, writings, photos, documentation, audio/video recordings. Information that is stated as private or sensitive by its owner is explicitly excluded from free access by others. Researcher is responsible to keep all information under his ownership. A digital copy of the final master thesis paper will be publicly available.

9. Voluntarism

All persons will be voluntarily participating in this research. Any person has the full right to withdraw from participation any time during the conduct of the research without the obligation to explain the reason of leaving. At any time of the research all participants have the right to ask for further explanations or changes of the consent regarding storage, manipulation and publication of personal and confidential data.
10. Responsibilities

The research is being conducted under the supervision of Department of Informatics, Faculty of Technology, Linnaeus University, Växjö, Sweden (http://www.lnu.se), as individual master thesis of the researcher. Personal and contact information of responsible persons are as follows:

**Responsible researcher:**
Name: Emmanouil Syrengeias  
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**Responsible supervisor teacher:**
Name: Jeff Winter  
Role: Senior Lecturer in Department of Informatics, Linnaeus University, Växjö, Sweden  
Phone number: +46 470 76 75 70  
Mobile number: +46 72 522 56 40  
E-mail: jeff.winter@lnu.se

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**Consent Form**

All participants in the research have been given information, have been given the opportunity to ask questions, have received answers to them and have given their consent to participation in the research.

[Place],[Date]

[Signatures]
Appendix C – Detailed presentation of NCR’s structure

C.1 Goals

“Network for children’s rights” N.G.O. started forming back in 2000. It was officially founded in 2005. Its main goals are to help, inform or organize activities and campaigns about issues such as (Network for Children’s Rights, 2016):

1. dissemination and enforcement of the UN Convention about “the Rights of the Child” that has been signed by Greece and 191 other countries around the world
2. information for children themselves about the institutions that protect them at national, European and international levels
3. support of families at risk of poverty
4. mobilization towards fighting each forms of discrimination
5. provision for quality education
6. encouragement of access to education for nationally or socially excluded groups
7. information and fight against child labor
8. emergence of belonging to vulnerable groups of children problems, such as migrant children, refugee children, repatriated children, hospitalized children, children incarcerated in institutions or juvenile prisons
9. awareness of our society about all forms of violence, insult, abandonment, neglect, abuse, mistreatment or exploitation of minors
10. restrictions in smoking, alcoholism and substances consumption from children
11. safe use of the Internet

C.2 Administrative Structure

Figure C.1 Administrative structure diagram of Network for children’s rights NGO
• Administrative Board
On the top of the organization there is the Administrative Board. It consists of eight persons: a) President, b) Vice President, c) General Secretary, d) Vice Secretary, e) Cashier f) three members. The Board receives all main decisions that have to do with the activities and operations of the NCR. It comes together once a week, every Monday, to discuss weekly issues and take all necessary decisions.

• Project Coordinators
Coordinators are employees who are responsible for the programs NCR runs. Each coordinator is responsible for only one program. He/She organizes all activities required. The activities have to do with organizing, coordinating and administrating human, material and financial resources to achieve the goals set by the Administrative Board. Coordinators inform the Administrative Board monthly about the progress and problems faced in their program.

• Volunteers
Volunteers are official members of the organization and provide their services freely without payment to help run various programs. Their services regard a wide field of practice like education, entertainment, administrative or technical support, web page administration etc. They communicate with the coordinator to agree about the tasks they have to do according to their duties. They don’t have a formal place in organization’s administration but they informally effect its decisions through the coordinators.

• Organization's Structures
"Network for children's rights" runs at this time four programs. Each group of people (employees and volunteers) who run a program consists a unit that is internally called a "structure". Each structure has one coordinator who is responsible for it.

a) "Culture Lab" structure (located in a neighborhood near the center of Athens)
It is the oldest and main structure, for the time being, of the NCR. The Lab is open every working day from 9.00 to 19.30 and some weekends of the year for all children without any discrimination. Children that are registered in the NCR until today speak 27 different native languages. They mostly belong to families that are refugees or immigrants. There they can attend educational and entertaining programs conducted by volunteers. There is a lending library where children can borrow books for a certain period of time to read at home. There is also an itinerant library that is touring around primary and secondary schools in a wide area around the "Culture Lab" workplace. Students may borrow books to read at home from this library without moving out of their school.

There are groups of volunteers and children who create artistic artifacts. There are classes where children are taking extra courses to support them in the formal educational process taking place at school. There are two classes where children and
their parents learn two native speaking languages, specifically Albanian and Arabian. In "Cultur Lab" book presentations by the book writers take place. The Lab organizes speeches about human rights, especially concerning children, by professionals. Employees and volunteers concentrate foods and clothing to give to poor families, refugees and immigrants.

b) “Center for the Child” (housed in former Greek Army Garrison Headquarters building):
It offers social services to children and their parents through the program that is called Solidarity Now. This structure, besides its coordinator, is employed by one social worker, one psychologist and two pedagogues. Children, parents or other adults who need social or psychological support may go and get consultancy services. The employees there may forward people to other structures for more help and support, e.g. language classes, lending library, food and clothing. Consultancy services about family issues, health care and language education for adults are also organized. Professionals of different professions (health and social workers, psychologists, lawyers, teachers) are invited to give speeches and discuss with children and adults about issues mostly concerning human rights of all kinds (of children, adults, immigrants, refugees etc.).

c) "Network at Triber" (located at Triber\(^2\) square in Athens)
A relatively new center (started its operation at the end of 2015) for creative activities for children and adolescents that go to preliminary, primary and secondary school classes (ages from 4 to 15 years old). In this place the NCR organizes cultural events that aim to leverage social life and cultural participation and expression of children and adolescents who live in underexposed neighborhoods of Athens.

d) "Refugees" support program
One coordinator is organizing activities for children that take place in refugee camps. The activities are primarily educational and entertaining. There are also activities that have to do with the concentration of food, clothes and toys from other organizations or civilians to give to refugees or immigrants in need.

- Scientific team
It is a team consisted by members of the Administrative Board, coordinators and social scientists who are designing and supervising activities that the NCR carries out. One main activity of this team is to coordinate and supervise the cooperation of the NCR with the Nationwide Network of Schools, a network of about 30, for the time being, Greek schools which organizes solidarity actions.

- Supportive divisions of the NCR
The structures are supported by other divisions necessary for the operation of the organization. These divisions were not especially discussed and analyzed as the coordinators did not want to focus on them as they are characterized as supportive to the main goals of the NCR. A small explanation of their role follows.

\(^2\) The square was named after Eric Triber, a German philhellene doctor who serviced the Greek army during the national liberating revolution started in 1821 against the Ottoman empire (source [https://el.wikipedia.org/wiki/Έρικ_Τράιμπερ](https://el.wikipedia.org/wiki/Έρικ_Τράιμπερ)).
Financial manager
An full time employee who is managing the financial transactions of the organization

Fundraising, Public relations, Communications development
A department with two full time employees who are responsible for these activities of the organization.

Organization’s financial resources come mostly form two sources. The first one is the contributions and donations of members and friends. Friends may be individuals or public and private institutions like other NGOs or enterprises. The second one is by the participation in E.U. programs and synergies with international NGOs. There is also direct funding by the Greek state but this is very limited nowadays. All grants are posted on the web and announced in details at the "Network’s News" every 3 months.

C.3 IS strategy

There is no special IS strategy in the organization. There are basic instructions on the needs for IT infrastructure for every workplace that houses organization's structures. According to this strategy, each place must has at least:

- one ADSL Internet connection,
- one ground telephony connection,
- one desktop pc (Windows 7 O.S. is installed in all desktop pc’s),
- one laptop (Windows 10 O.S. is installed in all laptops),
- one printer.

On each desktop pc and laptop there must be installed for use

- one browser,
- one Microsoft Office suit.

The employees and volunteers of the NCR are using:

- Google Gmail service for the e-mail communication needs. All e-mail addresses and contact information of children and volunteers of the organization are set up in Google Gmail,
- Internet services to search for information,
- Microsoft Word processor to create documents,
- Microsoft Excel application where information about employees, volunteers and members of the NCR are stored.

Besides the basic requirements of the IS strategy, there are more and different IT devices in each workplace, that help in organizing the different activities. These devices are described in IT infrastructure section.

C.4 IT infrastructure

a) "Culture Lab":
In Culture lab, besides the infrastructure and equipment described in IT strategy, there are also:
• one more desktop pc,
• three laptops for use by the employees or the volunteers according to everyday needs,
• one multi-function wireless printer,
• one interactive white-board,
• one laptop connected to the interactive white-board. It is used to support educational activities,
• one projector,
• one video camera to take videos during educational and entertaining activities, or interviews of children, adults, book writers and other who have taken part in these activities,
• three photographic cameras being used for the same purposes as the video camera,
• forty tablets. Tablets are being bought from donations of other organizations or individuals. They run various versions of Android OS.

Networking:
  • there is one wireless router for Internet and LAN access where the laptops connect to,
  • desktop pc’s connect to the router with cables,
  • all pc’s may remotely access each other and the Internet.

Software:
  Applications, besides those described in IT strategy section, that are used are:
  • Movie Maker to process videos,
  • “Open sesame” application is installed in all of the tablets. Children are using various activities included in “Open sesame” application during educational or entertaining programs held in the lab. Children may also use the tablets to access the Internet.
Appendix D – Outcomes of the Future Workshop

• Critique phase

Situations that coordinators found problematic:

1. Registry file for children members and volunteers for all structures of the NCR (Culture lab, Center for the child, Network at Triber, Refugees program).

2. Creation of members’ card. Employees and volunteers create every year new cards for all children members but many members neglect to get them.

3. Books loaning and members identification: there is a monthly task to sum up how many children, boys and girls, loaned books.

4. Funding for supporting families with financial problems and needs for supplies for e.g. cleaning materials.

5. Communicating actions: the NCR needs to have publicity so as to communicate its goals, actions and activities, e.g. through mass media or press announcements.

6. Warehouse organization: recording of content, what comes in – what goes out. Right now they use a notebook for this.

7. Searching for offers: NCR requires materials for its operation. It is not easy to find suppliers who will make special financial offers for these products to buy.

A grouping of the situations:

Group 1: Registry file of members – volunteers
   Situations 1, 2, 3

Group 2: NCR’s promotion
   Situation 4, 5

Group 3: Warehouse supply and organization
   Situation 6, 7

• Fantasy phase

Ideas on how to improve the workplace without logical limitations:

1. When a child borrows a book, by leaving Culture Lab the book is detected at the door, is automatically registered and the information is store in the loaning catalog file in a computer.
2. When supplies arrive in the warehouse are automatically stored and organized in the warehouse contents file.

3. Employees beam up from their beds to the office (Beam me up, Scotty!!!

4. When a group meeting or a class is canceled, all the members are informed automatically without any action taken by the employees.

5. There are voice commands that a child uses to make his/her own registration.

6. There is a device that meters the sound level and when a person is shouting it produces a sound signal to lower down his/her voice.

- **Realization phase**

The final mutual decision on which problematic issue the participants will intervene to improve:

1. Registry file

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Appendix E – Handwritten notes from Future Workshop

Figure E.1 Notes from Critique phase

Figure E.2 Notes from Critique phase
Figure E.3 Notes from Fantasy phase

Figure E.4 Notes from Realization phase
Appendix F – Handwritten notes from Prototyping

Figure F.1 Notes from Prototyping

Figure F.2 Notes from Prototyping
Figure F.3 Notes from Prototyping

Figure F.4 Notes from Prototyping
Appendix G – Screenshots of the prototype application

Figure G.1 Sheet of children members’ registration file (part 1)

We have created a table to store and manipulate data.

On the right side of each field name there is a button to open the tool for shorting, searching and filtering the records.

The function of table provides the user with the ability to short, filter and search for certain values for each column. This can be done for multiple columns simultaneously.

Figure G.2 Embedded sorting, searching and filtering tools

This line separates the left three first columns that are static from the right columns that move and disappear when we slide the sheet to the right.

Figure G.3 Sheet of children members’ registration file (part 2)
The field for registry renewal becomes green when it is affirmative (Yes) and red when it is negative (No). The user easily recognizes the value by the color.

**Figure G.4 Registration renewal field**

The user can enter values to certain columns using predefined lists.

**Figure G.5 Use of list for values entry**

There are informative texts to guide the user how to enter value.

**Figure G.6 Sheet with predefined values for lists**

A warning dialogue box informs the user for entering a non acceptable value.

**Figure G.7 Warning dialogue box**
The user chooses the school year for which he/she wishes to have statistics.

Subtotals and total are shown in this table.

Figure G.8 Sheet of volunteers’ registration file

Figure G.9 Statistics for registration renewal
Figure G.10 Statistics per family status

Figure G.11 Statistics per school class

The pie represents the percentages of the values. The viewer can see the subtotals also
**Figure G.12** Statistics per gender

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**Figure G.13** Statistics per home country

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Appendix H – Translation of field names of the prototype application from Greek to English language

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<th>Field name in English</th>
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<td>Member’s R.N. (R.N.=Registration Number)</td>
<td>Number</td>
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<td>Τάξη</td>
<td>Class</td>
<td>Text (from list)</td>
</tr>
<tr>
<td>Ημερομηνία εγγραφής</td>
<td>Date of registration</td>
<td>Date</td>
</tr>
<tr>
<td>Όνομα πατέρα</td>
<td>Father’s name</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Όνομα μητέρας</td>
<td>Mother’s name</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Οικογενειακή κατάσταση</td>
<td>Parental status</td>
<td>Text (from list)</td>
</tr>
<tr>
<td>Εργασία πατέρα</td>
<td>Father’s profession</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Εργασία μητέρας</td>
<td>Mother’s profession</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Παρατηρήσεις</td>
<td>Notes</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Ανανέωση εγγραφής [σχολικό_έτος]</td>
<td>Registration renewal [school_year]</td>
<td>Yes/No</td>
</tr>
</tbody>
</table>

Table H.1 Translation of Members’ sheet field names
<table>
<thead>
<tr>
<th>Field name in Greek</th>
<th>Field name in English</th>
<th>Type of data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Α.Μ. Εθελοντή</td>
<td>Volunteer’s R.N.</td>
<td>Number</td>
</tr>
<tr>
<td>(R.N.=Registration Number)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Επώνυμο</td>
<td>Surname</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Όνομα</td>
<td>Name</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Ημερομηνία εγγραφής</td>
<td>Date of registration</td>
<td>Date</td>
</tr>
<tr>
<td>Ειδικότητα</td>
<td>Specialty</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Διεύθυνση</td>
<td>Address</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Τηλέφωνο</td>
<td>Phone number</td>
<td>Phone number</td>
</tr>
<tr>
<td>Κινητό</td>
<td>Mobile number</td>
<td>Phone number</td>
</tr>
<tr>
<td>E-mail</td>
<td>E-mail</td>
<td>Hyperlink</td>
</tr>
<tr>
<td>Μαθησιακή υποστήριξη</td>
<td>Learning support course</td>
<td>Text (from list)</td>
</tr>
<tr>
<td>Πρόγραμμα Γονέων</td>
<td>Course for adults</td>
<td>Text (from list)</td>
</tr>
<tr>
<td>Δημιουργική ομάδα</td>
<td>Creativity group</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Παρατηρήσεις</td>
<td>Notes</td>
<td>Text (free)</td>
</tr>
</tbody>
</table>

Table H.2 Translation of Volunteers’ sheet field names

<table>
<thead>
<tr>
<th>Field name in Greek</th>
<th>Field name in English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Σχολική χρονιά</td>
<td>School Year</td>
</tr>
<tr>
<td>Χώρα καταγωγής</td>
<td>Country of origin</td>
</tr>
<tr>
<td>Φύλλο</td>
<td>Gender</td>
</tr>
<tr>
<td>Οικογενειακή Κατάσταση</td>
<td>Parental status</td>
</tr>
<tr>
<td>Τάξη</td>
<td>Class</td>
</tr>
<tr>
<td>Μαθησιακή Υποστήριξη</td>
<td>Learning support class</td>
</tr>
<tr>
<td>Πρόγραμμα γονέων</td>
<td>Course for adults</td>
</tr>
</tbody>
</table>

Table H.3 Translation of Data sheet field names
**Appendix I** – Translation of field names of the old registry file from Greek to English language

<table>
<thead>
<tr>
<th>Field name in Greek</th>
<th>Field name in English</th>
<th>Type of data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Επώνυμο</td>
<td>Surname</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Όνομα</td>
<td>Name</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Ημερομηνία Γέννησης</td>
<td>Date of birth</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Φύλλο</td>
<td>Gender</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Α.Μ. Μέλους</td>
<td>Registration Number</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Ημερομηνία Εγγραφής</td>
<td>Registration Date</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Όνομα Πατέρα/Μητέρας</td>
<td>Father’s/Mother’s Name</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Σχολείο</td>
<td>School</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Τάξη</td>
<td>Class</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Τηλέφωνο</td>
<td>Phone number</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Χώρα Καταγωγής</td>
<td>Home country</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Στοιχεία Οικογένειας</td>
<td>Family details</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Διεύθυνση κατοικίας</td>
<td>Home address</td>
<td>Text (free)</td>
</tr>
<tr>
<td>Ανανέωση κάρτας [...]</td>
<td>Card renewal [...]</td>
<td>Text (free)</td>
</tr>
</tbody>
</table>

*Table I.1 Translation of original registry file field names*
Appendix J – Statement by NCR

From October 2015 to March 2016 our coordinators Foteini Avdelli and Viola Gjoka worked together with Emmanouil Syrengelas to co-design an improvement of the registry file application where information about the members and volunteers of our organization is stored. The final prototype application improves the old registry file in the following issues:

- it provides a more user friendly environment for inserting and retrieving data,
- it provides more functionalities,
- it allows to perform certain tasks in less time occupying less people,
- it stores more information about members and volunteers.

The organization is in the phase of transition from the old registry file to the new one. Members’ and volunteers’ data are being transferred from the old application to the new one. Work is being done on the prototype to add new functionalities.

This statement was written and delivered to be used in Emmanouil Syrengelas’ master thesis.

Tuesday, 19th of December 2017

Panos Christodoulou
Executive Director
Appendix K – Declaration / Submission of the Thesis

Linnaeus University
Sweden

Declaration – Submission of the Thesis

This form should be included in the thesis. Before you sign please see http://refero.lnu.se/english/what-is-plagiarism/ where you found information about plagiarism and check also the Harvard System of referencing http://libweb.anglia.ac.uk/referencing/harvard.htm

<table>
<thead>
<tr>
<th>Name</th>
<th>Emmanouil Syrnegelas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course</td>
<td>Course Code</td>
</tr>
<tr>
<td>Degree Project at Master Level</td>
<td>16HT - 5I50E</td>
</tr>
</tbody>
</table>

Did you write the thesis alone or in cooperation with someone? Tick one of the boxes

- [ ] I am the sole author of the thesis.
- [x] The thesis is co-authored with other students, and together we are responsible for the entire project.
- [ ] The project report is co-authored with other students, and I am responsible for part of it. The parts I am responsible for are specified in the project report.

I declare that in my/our thesis, I

1: did not re-use my previous work without referring to it
2: did not use others work without referring to their work (e.g. course literature, scientific publications, other types of articles, web sites or lecture material)
3: use the references and quotes in a proper way
4: included all references and resources in a reference list

I am aware that not citing and using references in a correct way may be considered as plagiarism

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>08/02/2018</td>
</tr>
</tbody>
</table>