



## Department of Information Engineering and Computer Science

MASTER'S DEGREE IN

**Computer Science** 

FINAL DISSERTATION

## Evaluating Usability of Communics Authoring Tool: Comparing Synchronous with Asynchronous Remote Evaluation when using Cognitive Walkthrough

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## Abstract

Usability Evaluation is essential for developing user-friendly interfaces that are welcomed by users. There are many types of evaluations, but Cognitive Walkthrough is a usability inspection method that is centred on evaluating the ease of learning of a program's interface. This attribute was the precise one that needed to be examined in the recently designed Communics' Authoring Tool; however no studies were found on the best way of how to conduct this method remotely.

Thus, this research had two main aims: The first one was to find the usability problems of the design and to re-design the interface according to the issues found. The second one was to compare the effects of carrying out a remote Cognitive Walkthrough synchronously or asynchronously and to conclude with some future recommendations for undertaking this method remotely. The comparisons made in the study were based on the number and severity of usability problems found, on the task performance and on the participant's satisfaction. In the end it was found that both methods have their advantages and drawbacks and a recommendation for improving the remote technique was made by combining the good elements of both methods.

*Keywords:* Authoring Tool, Usability Evaluation, Inspection Method, Cognitive Walkthrough, Remote Evaluation, Synchronous Evaluation, Asynchronous Evaluation.

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## **Chapter 1. INTRODUCTION**

## 1.1 CONTEXT

This project is part of a bigger one called Migrantech, which was started by the Fondazione Bruno Kessler in Italy and University of Haifa in Israel. Migrantech aims to identify the effect of computer-mediated contact in the acceptance of immigrants in society. The reserch hypothesis was that, under certain condition, the joint elaboration of a common narrative may help reduce the stereotypes and hostile attitudes. The approach is based on social constructionst theory (Zancanaro, Stock , Eisikovits, Koren, & Weiss, 2012).

At the heart of Migrantech was the creation of a tool called Communics, which sought to support the creation of joint narratives by two persons that don't speak the same language. With the use of Communics, two culturally different participants can create a narrative in the form of an illustrated story on the topic of the conflict. The illustrated story is created by taking turns when designing the vignettes with the aid of backgrounds, characters (with different expressions and body postures), objects and predefined language expressions (for translation purposes). As such, the tool seeks to foster interaction between any given pair of people with the objective of supporting collaborative storytelling in a multi-cultural and intergroup setting in order to facilitate reconciliation in social and ethnic conflicts.

At present, contributors to Migrantech have to upload content through a database that cannot be manipulated with ease by people with no technical skills. Contributors to Migrantech are demanding an interface to cover all possible needs that cultural mediators or intercultural practitioners with a background in Sociology, International Studies, and/or Counselling can have when uploading content. As such, to further the research accomplished by Migrantech to date, a tool (from hereon, the "Authoring Tool") that would allow users with no programming skills to be able to easily upload content to Communics is needed.

Consequently, the design of this Authoring Tool was carried out during the internship period following all the requirements of the team spurring Migrantech. This will be briefly explained in Chapter 4 for explanatory purposes because it is linked to the task definition in the evaluation. The evaluation of the Authoring Tool and the further research on remote Cognitive Walkthrough corresponds to this master thesis.

## 1.2 BACKGROUND

Software development is an iterative process and evaluating it in different stages of the process is very important for the future success of the program. This is why interface evaluation is recognised as a fundamental aspect of quality control and assurance in today's dynamic industry; having become subject of study by many scientific researchers of the Human-Computer Interaction (HCI) community.

Researchers have been reviewing and summarizing lots of evaluation techniques and methods in different books and publications: The Human-Computer Interaction Handbook, Testing and Evaluation (Sears, 2003), Evaluation of Human-Machine Interfaces and the development of their interactive system (Grislin & Kolski, 1996) and Evaluating user-computer interaction: a framework (Sweeney, Maguire, & Shackel, 1993). In between these evaluation techniques, Usability Evaluation method is found and many of the researchers have exhibited advantages of this technique during the Software's development life cycle. The most mentioned as regards to interfaces with high usability are: execution, security and high end user productivity (Scholtz, 2004).

Methods of Usability Evaluation can be divided into Usability Inspection and Usability Testing (Holzinger, 2005). The testing path involves a set of summative evaluation techniques that rely on real users to discover the usability problems of the interface. The inspection path is very much alike the procedure of quality control, but rather inspecting the product's issues, it identifies potential interface problems that users would



have when performing certain tasks (Cockton, Lavery, & Woolrych, 2003). The Usability Inspection method encompasses three techniques: Heuristic Evaluation, Cognitive Walkthrough and Task Analysis. They can be applied separately or combined and are normally executed by two to three evaluators with usability expert knowledge (Chou & Mustafa, 2014).

The Cognitive Walkthrough, present as Usability Evaluation technique in this Master thesis, connects the interface walkthrough to a cognitive model. Basically, the actions and reactions of the interface are evaluated by the expert depending on the user's objective using a series of predefined questions linked to the method's cognitive model. This method not only meets the basic usability principles, but also targets at the specific user's goals when operating certain tasks.

Finding experts that can evaluate the interface presents a number of difficulties. Hence, performing Cognitive Walkthrough remotely comes to the fore as a robust solution. Typically, remote evaluation is done to overcome the absence of end-users and a natural environment (Alghamdi, Alroobaea, Al-Badi, & Mayhew, 2013), but in this case it will be used to overcome the shortage of, and difficult access to, local experts. There are two main approaches to the implementation of remote methods: carrying out the evaluation synchronously (moderated by someone) or asynchronously (without moderator). Given the lack of research analysing the effectiveness of the two types of remote testing methods, this study will compare the differences between synchronous and asynchronous remote evaluation when using Cognitive Walkthrough.

## 1.3 MOTIVATION

On the one hand, the main purpose of this master thesis is to evaluate the usability of Communics' Authoring Tool and to identify potential improvements. As mentioned, the Authoring Tool was prototyped during the internship period, but it was not tested. There is a need for testing the usability of the tool before programming it because it saves costs, not just financial costs but also time costs (Nielsen, Usability Engineering, 1993) and, given the tool is being developed for a profit-oriented institution; resource efficiency is a significant consideration. Furthermore, representatives from the University of Haifa specifically asked for the tool to be intuitive for a user so data entry would constitute a straight-forward, fast process that caused minimal user frustration and required little if any user training. In addition, the testing is motivated by the demand of minimizing iterations during the actual development in order to accelerate adoption (Salesforce, 2011).

On the other hand, the aim is to find differences between synchronous and asynchronous remote usability testing when performing a Cognitive Walkthrough. This was prompted by the fact that the testing had to be done remotely because of the distancing of the team members. In addition, in usability experts were available for contributing in the evaluation acting as participants for testing the tool and the main usability attribute to test was the learnability. So, joining these two conditions it was apparent that the best solution would be to carry out an Inspection Usability testing method, in particular a Cognitive Walkthrough. Later on, after reading different papers on remote testing and Cognitive Walkthrough that will be mentioned later on in Chapter 2 it was not clear if the best way to carry out the testing was to do it synchronously or asynchronously. As it will be seen in that chapter, studies noticed that in other types of testing (not Cognitive Walkthrough) there are advantages and disadvantages for both. So, as no study was found on comparing the differences between synchronous or asynchronous remote testing when undertaking a Cognitive Walkthrough, it was decided that the only way to find out was to find self-conclusions and in this way contribute to the scientific community.

## 1.4 **PROBLEM STATEMENT**

The problem faced will be concentrated on the actual scientific research which is to find the differences of synchronous and asynchronous remote testing when doing a Cognitive Walkthrough. Then, as a consequence



of that research the usability problems that Communics Authoring Tool has will be discovered and some future recommendations will be made.

As the main goal of conducting usability studies is to find as many real and useful usability problems as the program has, it was decided to concentrate the problem statement on the things that most influence the effectiveness of the usability problems discovered. In this way we will find out which method (synchronous or asynchronous remote testing) is more effective for finding usability problems with Cognitive Walkthrough overall and/or to find out the particular differences depending on the metrics used. The best metrics according to most of the papers read are: Number and type of usability problems found, task performance and participant's satisfaction (Andreasen M. , Nielsen, Schrøder, & Stage, 2007) (Brush, Ames, & Davis, 2004) (Thompson, Rozanski, & Haake, 2004) (Sauro & Kindlund, 2005). So, according to this, the research questions are going to be:

1. What kind of difference is there in the number and type of usability problems found between synchronous and asynchronous remote testing when using Cognitive Walkthrough as evaluation method?

2. How does synchronous and asynchronous remote testing vary when using Cognitive Walkthrough with regards to task performance (time spent on tasks and task completion rate)?

3. How does synchronous and asynchronous remote testing vary when using Cognitive Walkthrough depending on participants' satisfaction level?

### **1.5 OBJECTIVES**

The objectives of this research are the following:

1. Review literature on usability methods for finding one that suits the whole project.

2. Design a methodology for comparing synchronous and asynchronous remote usability testing with each other with the help of the research questions.

3. Find out as many effective usability problems of the Authoring Tool as possible.

3. Choose the most important tasks that the Authoring Tool users will be doing for testing.

4. Refine the Authoring Tool Axure Prototype so that it fits the selected tasks.

5. Efficiently carry out the remote user tests.

6. Generate a list of future recommendations that will solve the usability problems found.

7. Make a list of differences between synchronous and asynchronous remote usability testing when undertaking Cognitive Walkthrough that can help people decide in the future.

8. Out of the lessons learnt, make a list of future recommendations when doing remote evaluation with Cognitive Walkthrough.

9. Outline opportunities for further research.

### **1.6 Methodology**

The methodology selected for finding usability problems in the usability inspection method of a Cognitive Walkthrough. This technique gives the designer the opportunity to have a formal framework that permits a

designer assess if there is enough information in the interface for the user to find out how to achieve a certain task. Particular scenarios are given to the evaluators so that they can use a set of guidelines for assessing the information existent in the interface (Virzi, 1997). This technique will be combined with remote testing because of dispersal reasons of the team, and this time will also be exploited to compare synchronous and asynchronous remote testing when undertaking the Cognitive Walkthrough technique.

The experimental methodology is described in Figure 1 and it was chosen as the most useful way for answering the research questions and carrying out the usability testing of Communics' Authoring Tool. This study is more qualitative, but will have some basic quantitative analysis. The methodology process was mainly inspired by (Granollers & Lorés, 2006) and (Alghamdi, Alroobaea, Al-Badi, & Mayhew, 2013)



Figure 1: Methodology Timeline



## 1.7 THESIS OUTLINE

The report will be structured in the following way:

Chapter 1: Introduction. An introduction that summarises the project in order to give a general idea.

*Chapter 2: Extended Background.* Deep literature research of the techniques used in the methodology to do the Authoring Tool's Usability Evaluation.

Chapter 3: Migrantech. Presentation of Communics Tool to understand its design and evaluation.

*Chapter 4: Design Process.* A summary of the design process in order to understand the task selection linked to the cognitive model.

Chapter 5: Research Methodology. Description of the steps carried out to accomplish the study.

Chapter 6: Analysis of Results. Transcribing the findings obtained and discussing them.

Chapter 7: Conclusions and Future Work. Reviewing the relevant research outcomes that are answers to the research questions and proposing future investigations on the subject.

### **1.8 DEFINITIONS**

Authoring Tool: Software that aids non-programmer users to upload their own content to a multimedia application or system (BusinessDictionary, 2018).

*Usability:* According to ISO 9241-11, "Usability is the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use." (ISO, 2018).

Usability inspection: The common name for a group of cost effective ways of evaluating user interfaces in order to find usability problems (Nielsen, 1994).

*Cognitive Walkthrough:* A usability inspection evaluation type that anticipates how easy it will be for users to learn to carry out particular tasks on a program (Blackmon, 2004). The evaluator, normally a usability expert, performs tasks that a typical interface user will do and evaluates the actions and responses of the system according to the user's knowledge through responding to some questions related to the method's cognitive model (Mahatody, Sagar, & Kolski, 2010).

*Synchronous remote testing:* A method of remote testing where the evaluator is not located in the same place as the participant but can see and interact in real time with him through video calls for example (Alghamdi, Alroobaea, Al-Badi, & Mayhew, 2013).

Asynchronous remote testing: A method of remote testing where the evaluator is not located in the same place as the participant and cannot see and interact in real time with him, but through a series of written instructions (Alghamdi, Alroobaea, Al-Badi, & Mayhew, 2013).





## **Chapter 2. EXTENDED BACKGROUND**

### 2.1 USABILITY

According to the ISO 9241-11 standard, usability is the term used to describe that a product is utilised by its users to obtain certain objectives with effectiveness, efficiency, and satisfaction. Effectiveness refers to accomplish the user's goals; efficiency regards the resources that the users need to achieve the goals (e.g. Effort and Time) and satisfaction has to do with their experience. But Nielsen's and Mack's usability definition, the one that has had a bigger impact on usability context, defines usability as: "usability is a fairly broad concept that basically refers to how easy it is for users to learn a system, how efficiently they can use it once they have learned it, and how pleasant it is to use" (Nielsen & Mack, 1994). In addition, they divide usability in five elements instead of three, he calls them usability attributes and are used to measure and specify usability objectives. They are: learnability, efficiency, memorability, errors and satisfaction, as seen in Figure 2. Based on the type of system, one attribute may be more important than other.



Figure 2: Nielsen's Usability Attributes (Sippola, 2017)

Learnability means that systems must be easy to learn as this influence the first impression that the user has with the software. Essentially this means that the user has to be able to interact with software as fast and effortless as possible; always taking into consideration the level of complication of the system and the user experience of the user.

Efficiency deals with the concept of how fast a user can complete a task once the system is known by the user. Sometimes there are users that don't need to know how to use the whole system and are just satisfied with knowing the basic functionality to complete their jobs; in this case the efficiency should take the tasks that the user needs to do into account.

Memorability enters into action when users previously manage the system properly but they stop using it very often. It tests how well the users recall the system's functions after they had already learnt how to use the system properly.



Errors must be prevented in the system as much as possible as it confuses the users. Errors are defined as functions done by the users that don't finish with the expected result. A system with as less errors as possible is the best to have; having a proper list of instructions is always useful to aid this.

Satisfaction has to do with how pleasing a system is to use by the user. This is directly correlated with the user's motivation and consequently the effectiveness of handling it, so it is quite important that the user is satisfied with the product when he is using it.

Poor usability of an interface can arouse errors that can bring about various types of risks (e.g. Achieving the wrong goal, having unexpected costs, inconvenience of spending too much time understanding the software...) (ISO, 2018). This is why over the years researchers have developed different usability evaluation techniques.

## 2.2 USABILITY EVALUATION

Usability Engineering in the field of study that presents controlled methods to accomplish usability in user interface design. Usability evaluation is a key component in this process that is composed by three basic stages: requirement analysis, design/testing/development and installation. Usability goals, sometimes also called pain points, are defined during the requirement analysis; iterative testing or inspection is carried out during the design, testing and development to compare the prototypes with the usability goals and in the end, installations are controlled with user feedback so that the functionality wanted is obtained. Usability Evaluations can be taken by end-users, usability experts or they can be model-based (Scholtz, 2004).

The main objective of usability evaluation is to find usability problems in the interface by providing qualitative and/or quantitative data during the software development life cycle. Usability evaluation methods can be described as any method or procedure that attempts to do a usability evaluation of a user interface in order to find usability problems. Some usability methods categorise the usability issues according to their type, map problems to specific features of the program that cause it or recommend a different design solution (Hartson, Andre, & Williges, 2001). During the past 30 years different evaluation techniques have been created and studied to try to detect and solve usability problems; a timeline of them was provided by Scholtz in 2004 and can be appreciated in Figure 3.



Figure 3: Main Usability Methods developed over the past 30 years (Scholtz, 2004)

Generally speaking, usability evaluation can be divided into two different approaches: formative evaluation and summative evaluation. Formative evaluation has more to do with the evaluation that must be done through the development phases, while summative evaluation is normally carried out when the development is finished.

Formative evaluations obtain feedback in early concepts of software design and are typically more informal as the goal is to collect as much information that benefits the next iteration of the design. They are used for



evaluating paper prototypes, initial screen designs, partial prototypes, non-functional prototypes, etc. Sometimes in further stages they even use logging software to capture the interaction design of the software. Furthermore, usability moderators often take note of incidents that happen throughout the evaluation and do a debriefing or a post-evaluation interview in order to clarify or expand some aspects of the evaluation. As evaluations need to be carried out quite often, they tend to focus on specific aspects of the design and use 2-3 participants.

Summative Evaluations tend to be more formal evaluations that are done to document the usability characteristics of software. The amount of participants needed for this type of evaluation varies between 5-7 per type of user group identified. This means that if for example a product is being designed for individuals and businesses, the product should be tested for both user groups. Effectiveness, efficacy and satisfaction are the metrics most commonly used and a properly planned experimental design is essential for the methodology. The tasks selected in the evaluation normally exemplify the main functionalities of the program, but sometimes new or improved functionalities are also included in the task definition. The requested level of usability has to be defined at the start of the usability engineering and the final results of the summative evaluation will be compared to that. If the results are negative sometimes the software release is postponed in order to do some modifications (Scholtz, 2004).

Apart from the formative and summative approaches, usability methods can also be divided into inspection and test approaches as illustrated in Figure 4 (Holzinger, 2005).



Figure 4: Usability Evaluation Methods

The test approach is part of the summative methods that depend on real users in order to discover usability problems that an interface has. The main element that characterises this approach is that real users normally retrieve more contextualised and defined feedback. The drawback of testing with real users is that, as not all answers from the users are reliable, the tests need a big number of participants for assuring the accuracy of the verdicts. This elevates the costs of the testing and could be the reason why the tendency of using the testing approach is decreasing according to the UPA Survey (UPA, 2009). However, they are methods that are very still used by professionals in projects that need a strong user feedback.

Usability inspection forms part of the formative techniques and is very alike to procedures they do in quality controls but they switch the product's bugs with the potential interface problems. Heuristic Evaluation, Cognitive Walkthrough and Task Analysis are procedures for the Inspection Approach. These techniques can be practiced together or apart and are evaluated by two or three evaluators that have experience in usability. This means that usual procedures do not imply real users because professional's opinion is enough for this approach (Chou & Mustafa, 2014). Inspection techniques are the chosen option in projects that have to reduce costs. As this project needs to use minimum resources, the methods that belong to the inspection approach will be detailed.

### 2.3 INSPECTION METHODS

Inspection methods started to emerge in the 80's as a consequence of bringing into practice the procedure of debugging a program's code into the graphical interface (Eagan, 1986). Using inspection methods brought alternatives to the market as it was very difficult to gather a great number of test participants; if testing needed for example thirty users, with the inspection method you would only need three (Nielsen, 1994).



Before the 90's, usability inspections didn't follow any specific criteria and only relied in the evaluator's experience (Nielsen, 1994). So, as doing informal inspections was a bit controversial because every evaluator took as reference a different thing, academics and industrial researchers decided to start formalising the usability inspection approach by creating new techniques that followed specific procedures (Shneiderman, 1987). So, from 1990-93 all the researchers started developing new evaluation methods based on inspection that were inspired by existing ones (Dumas, 2007). From then onwards, the main three inspection methods that were created and that still remain in use are Heuristic Evaluation, Cognitive Walkthrough and Task Analysis. All of those are considered as expert-based evaluations that investigate the usability of an interface.

Heuristic Evaluation is quite popular nowadays, it was first presented by Rolf Molich and Jakob Nielsen in 1990 (Nielsen & Molich, 1990). The procedure that they use is basically to evaluate the interface with the help of the heuristics usability principles and a small number of usability experts that note the importance of the usability problems found (Hollingsed & Novick, 2007). First tests done to heuristics evaluations showed that five to ten evaluators where needed to find out between 55% and 90% of the usability problems, so they concluded that it was a cheap and easy method for substituting user testing (Nielsen, 1992) (Nielsen & Phillips, 1993). Following these studies, others were made with diverse opinions. One said that heuristics can find many usability problems but not as relevant as empirical testing (Jeffries, Miller, Wharton, & Uyeda, 1991) and another study said that this was due to the differences in the evaluator's expertise (Karat, Campbell, & Fiegel, 1992). Nielsen investigated this further and concluded that if they are using regular usability experts and not double usability experts then you would need more experts for the inspection. But heuristics also have disadvantages collected by Jeffries and Desurvire (Jeffries & Desurvire, 1992). They are the following: evaluators must be experts in usability with years of experience which are sometimes hard to find, good usability experts are costly and some issues may be false as they are suppositions that experts do and may not bother the user in real life.

Task Analysis investigates user's actions when performing a task (Rogers, Sharp, & Preece, 2011). This is why it can also be called action analysis, in which the meaning of task is seen as a series of actions without inside structure (Holzinger, 2005). It was first developed for helping the labour force in occupational task performance, and later it was implemented in the Human-Computer Interaction field (Annett & Duncan, 1967). Task analysis divides the tasks in the lowest levels of action and experts analyse the sequence according to an objective and the type of user, as the same task can be done in two different ways depending on the user for example, and assemble the actions into the correct order. Task analysis can be supported by open-end interviews and questionnaires in order to gain more information about why people would perform the task in that way (Cooper, Reiman, & Cronin, 2007). End questionnaires can be face-to-face or a survey (Jonassen, Tessmer, & Hannum, 1999). All-in-all, Task Analysis just needs one experienced evaluator, but it is quite time consuming and very dependent on the evaluator's skills. Furthermore, it is a quite limited approach as it cannot predict what users will do when they have to carry out difficult tasks (Rogers, Sharp, & Preece, 2011).

Cognitive Walkthrough started with the idea of exploring the mental process that a user needs to do when leaning a new thing, specifically how to complete a task by exploring the possible options of a system (Lewis & Wharton, Cognitive walkthroughs, 1997). It then was applied to interfaces and began being used for desktop applications, although in the future it was expanded to web-based apps and other devices. This method assesses if an application has enough instructional hints for the user to do a task. It involves various evaluators and needs a person to walk through the different set of features of the program and to corroborate any usability issue they encounter with questions. Normally Cognitive Walkthroughs are done with a prototype that is very close to the future real one in order to explore effectively the design from the user's perspective (Rogers, Sharp, & Preece, 2011). The key for a successful result is to document every step in each task properly and give special attention to the problems so that in the future you can classify the severity of them. The strength of this technique is that it analyses every possible step that the user might do to complete the task; this is critical when it comes to evaluate safety systems for example. This methodology is contemplated as cost effective as it doesn't use real users and the development team, except for the designer, can play around between themselves for identifying problems. Cognitive Walkthrough is also considered time consuming as for each action the evaluator needs to answer lots of questions, this is why



some evaluators get a bit bored sometimes and don't pay lots of attention in the end of the inspections. As this is the selected method for the usability evaluation, more details about this technique will be given in the following section.

## 2.4 COGNITIVE WALKTHROUGH

Cognitive Walkthrough method was thought by Lewis, Polson, Wharton and Rieman in 1990 (Lewis, Polson, Wharton, & Rieman, 1990), however it has evolved into different variants. Nevertheless, the main principle of having a method that imitates the cognitive behaviour or a user by answering a series of questions related to the user's cognitive model remains intact in all variants (Mahatody, Sagar, & Kolski, 2010). The model was constructed based on the exploratory learning theory, that had 3 pillars; learning component, problem solving component and execution component (Polson & Lewis, 1990). The model believes that a user chooses an action among the other possible ones based on the analogous between goals and the expected result of the action. Then, after doing the action, the user evaluates the system's response according to their goal. If the aim was successful, the user memorises the steps taken by the system, but if it is not successful the problem-solving component appears in order to find the correct action. The execution component is the act of finding a general rule that matches the context.

In 1994 Wharton, Rieman, Lewis and Polson studied the history of this method (Wharton, Rieman, Lewis, & Polson, 1994). Meanwhile, the principal limitations that this method had were the repetitiveness of filling out forms and the limited number of problems found. Addressing these limitations, it was decided to use a small group of evaluators so that they could rotate the form within the group and to keep record of all problems found during the evaluation (Rieman, Franzke, & Redmiles, 1995). These new patches were described informally. Another inconvenient was that the method didn't had clear guidelines when talking about what makes an action available to a user and what type of actions are considered by a big enough range of users (Wharton, Bradford, Jeffries, & Franzke, 1992). To fix this, the answer is to describe the user population to the evaluator at the start of the inspection. Novick and Chater tried this method in operating procedures and found that it was a very good way for receiving feedback and completing documentation (Novick & Chater, 1999). Spencer found some difficulties when applying the method in a big software project that had to do with the development team (Spencer, 2000). His conclusions were that the usability specialist has to avoid design discussion and to defend team members.

Essentially, since its appearance and with its modifications, Cognitive Walkthrough has been an effective inspection method that can be easily applied. Nonetheless, the selection of task scenarios can be challenging as if the scenario is not properly described, the evaluation can be less effective. Despite this fact, Cognitive Walkthrough is still used in the present for tourist online guides, pda-based games, management tools, etc. (Hovater, Krot, Kiskis, Holland, & Altman, 2002).

Dix, Finlay, Abowd and Beale classified the differences between the different analytical techniques using the main factors for choosing a specific evaluation method (Dix, Finlay, Abowd, & Beale, 2004). They are detailed in Table 1 and helped in selection of an evaluation method for this project.



Cognitive walkthrough	Heuristic evaluation	Review based	Model based
Thursday	Thursday	Davies	Destau
Inroughout	Inroughout	Design	Design
Laboratory	Laboratory	Laboratory	Laboratory
No	No	As source	No
Qualitative	Qualitative	As source	Qualitative
Low level	High level	As source	Low level
N/A	N/A	As source	N/A
No	No	No	No
Medium	Low	Low-medium	Medium
Low	Low	Low	Low
High	Medium	Low	High
	Cognitive walkthrough Throughout Laboratory No Qualitative Low level N/A No Medium Low High	Cognitive walkthroughHeuristic evaluationThroughoutThroughoutLaboratoryLaboratoryNoNoQualitativeQualitativeLow levelHigh levelN/AN/ANoNoMediumLowLowLowHighMedium	Cognitive walkthroughHeuristic evaluationReview basedThroughoutThroughoutDesign LaboratoryLaboratoryLaboratoryLaboratoryNoNoAs sourceQualitativeQualitativeAs sourceLow levelHigh levelAs sourceN/AN/AAs sourceNoNoNoMediumLowLow-mediumLowLowLowHighMediumLow

Table 1.	Classification	of analytical	methods of	evaluation (Di	x Finlay Ab	owd & Beale, 2004)
ruore r.	clussification	ij unaryncar	memous of	craination (Di	л, 1 ттау, 110	ona, a Deare, 2001)

During the Cognitive Walkthrough the evaluators check for potential usability problems in all of the steps that the user needs to do in the interface to complete a task. The principal focus is to stablish how easy to learn a system is through user exploration. Experience in the field shows that normally users prefer to learn by doing than by needing previous training, so the questions that are asked to the evaluator have to do with exploratory learning. The same questions are asked in every step taken to complete the task and they try to solve if the step to be taken is good for a new user.

#### **2.4.1 GENERAL PROCEDURE**

#### 2.4.1.1 Before the inspection

For carrying out a Cognitive Walkthrough you need four things before the inspection starts (Dix, Finlay, Abowd, & Beale, 2004):

- 1. A prototype complete or incomplete, but quite detailed, prototype of the system. Details like wording and using real examples can be very important.
- 2. A task description that the users will normally have to do in the system. Consider realistic tasks and no more than five tasks per walkthrough session. Always start with simple to complex tasks and consider tasks that involve the use of multiple features and that are very important for the user's goals of using the program. Apart from these, Wilson's chapter of Cognitive Walkthroughs in the book "User Interface Inspection Methods", lists more factors to consider when choosing the tasks for the Cognitive Walkthrough (Wilson, Cognitive Walkthrough, 2014):
  - a. Client specific requests;
  - b. Product Constraints;
  - c. Parts of the interface that the design team is uncertain of;
  - d. Verify reputed problems;
  - e. Critical parts of the interface;
  - f. Parts of the interface that the user will constantly manage;
  - g. Important pain points;
  - h. New features.
- 3. A list of actions that the user has to do on the system in order to complete the tasks.
- 4. A description of who are the users, what kind of experience they have with similar systems and knowledge the evaluators can assume.

In addition, Wilson's chapter about Cognitive Walkthrough suggests (Wilson, Cognitive Walkthrough, 2014):

1. Develop rules for the Walkthrough. Phones in silent mode, no other computer apart from the one used to show the prototype, no design discussions during the walkthrough (only after to clear things),



if the designer is present he cannot defend the design during the walkthrough, participants are asked not to use bad language and the moderator can remind this rules during the test.

2. Select the evaluators, if they have experience in project with different backgrounds the better to get diverse opinions.

In the same chapter, Wilson illustrates very clearly and summarised in Table 2 the documents and materials that are needed for the evaluation (Wilson, Cognitive Walkthrough, 2014).

Table 2: Documents and Materials	needed for a Cognitive	Walkthrough (Wilson,	Cognitive Walkth	rough, 2014)

Document or Item Name	Description	Required or Optional	
User profile	Description of the primary users who perform the tasks that will be evaluated in a cognitive walkthrough.	Required	
Task list	The task list should describe the task in a realistic and concrete manner.	Required	
Action sequence for each task in the task list	Action sequence for each task in the task list • Date • Analysts • Users • Interface • Task • Comments.		
Problem reporting form	This is the form for recording the problems that emerge from the walkthrough.	Required	
Representation of the UI	Flip charts, electronic display of outputs from cognitive walkthrough, prototypes, or working features.	Required	

#### 2.4.1.2 During the inspection

When the evaluator receives all of the material they need, they will have to go over the entire list of actions with the modulator for the different tasks in order to judge the interface by answering the following four questions for each step taken:

- 1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)
- 2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.
- 3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.
- 4. After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.

It is very much recommended to prepare a document where to record all the evaluator's answers. The document must contain the date and time, the evaluator's name and the moderator's name. Filling the document can be done recording or writing and the evaluator can be invited to comment by the modulator at the start or can be directly questioned by the modulator for each step in the task. Whenever the evaluator finds a problem, it should be classified into another report called usability problem report sheet. It has to indicate the version of the system, the date, the evaluator, a detailed description of the usability problem, the severity of the problem (based on the occurrence of the problem and the seriousness for the users) and if the



problem is local or global. This last report helps designers easily prioritise the problems identified for future corrections.

Finally, it is recommended to record any design suggestion, problems that were not found as a direct output of the walkthrough, user assumptions, task comments and any other information that may be useful for a future design. In addition, as this form of evaluation is quite tedious, it is recommended to record more in deep only the actions that have or may have a problem, to use a data sheet that is easily recognisable and to select the most important tasks to inspect.

### 2.4.1.3 After the inspection

After the Walkthrough has taken place the person analysing the results should:

- 1. Classify all the repetitive usability problems found by different evaluators.
- 2. Give priority to the most urgent problems.
- 3. Discuss potential solutions with the designers.
- 4. Evaluate the problems that could have occurred during the walkthrough and see it there are any improvements that could be done for next time.
- 5. Give priority to learnability problems that are based in skill gaps that prevent a user to complete a task successfully.
- 6. Design suggestions should be kept in a different report.

#### **2.4.2 ADVANTAGES**

The advantages for carrying out a Cognitive Walkthrough as an interface evaluation method are:

- It does not require a totally working product.
- It does not require real end-users for testing.
- It can be applied in any phase of development that has enough information that describes what the system does.
- It provides detailed information to every problem found so it is easier to find a solution.
- It has a properly defined procedure that is task-based and focuses on the learnability attribute of usability.
- You avoid evaluating the system with users that are not into cooperating with the project and don't describe the reason for the actions they are taking properly.

#### **2.4.3 DISADVANTAGES**

The disadvantages of carrying out a Cognitive Walkthrough are:

- Cognitive Walkthrough focuses too much on the learning and leaves apart some other usability metrics that other evaluations methods consider.
- The method is quite tedious and slow and can influence in the participant's way of answering the questions.
- The method is limited to the tasks proposed by the one ideating the inspection method.
- It does not work very well for very complex tools that have two or more different paths to reach a goal.

### 2.5 **REMOTE EVALUATION**

According to Hartson et al., remote usability testing is a usability evaluation in which the person controlling the test is separated in space and/or time from the participant of the test (Hartson, Castillo, Kelso, & Neale,



1996). The word 'remote' illustrates the distance that exists between the participant of the test and the evaluator (Castillo, 1997). Remote usability testing can be synchronous (moderator present in real-time during the test) or asynchronous (moderator is not present during the test in real-time).

Lots of usability studies are carried out in a laboratory setting in which the participant is carrying out a task and the evaluator is looking at him from the distance. Taking the participant to the lab makes him move from his comfort zone to a lab, this implies costs for the lab and wasting the participant's time. However, remote testing avoids these issues; making the test more economic it the participant has the resources in order to take the test remotely. Moreover, sometimes you cannot find software specialists or users with the profile that you are looking for in your city or country and the costs of paying the travel to the participants does not make up for the test results that can be obtained, so in these cases remote testing is a very good solution. In addition, remote testing can provide data for tests in which a big number of participants are needed (Ratner, 2002). Finally, sometimes depending on the system tested, it is positive for the testing that the participant remains in his usual place in order to get more realistic results. As opposed to all of these positive opinions about remote testing, there are others that suggest that remote testing makes the interpretation of results more difficult to the evaluator as they may miss some contextual information of a facial expression that can be determinant.

### **2.5.1 GENERAL PROCEDURE**

An article in Nielsen Norman Group's web page explains the steps that have to be done before, during and after remote testing (Moran & Pernice, 2018):

#### Planning the study:

- 1. Decide what tool you are going to use to communicate with the participant. (e.g. Skype, Facetime, TeamViewer, Join.me, email, phone...) This must be decided according to the requirements of the test.
- 2. Plan how to explain the tasks to the participant. Use screen sharing, send the documents separately...
- 3. If it is possible, schedule a practice session to test the technology or make the participant connect a bit before the test time.

#### Day before the session:

1. Confirm/remind the assistance or day maximum for sending the test results.

#### During the session or after you received the test results

- 1. Start by thanking the participant and by signing the consent form
- 2. Run the session
- 3. Finish the session by thanking the user.

#### **2.5.2 Synchronous Remote Evaluation**

Synchronous remote evaluation occurs when the participant and the evaluator are in a different space but can interact with each other in real-time. It is also sometimes called collaborative or live remote testing. The main advantage of this type of remote testing is that it has lots of similarities with a normal lab usability evaluation (Selvaraj, 2004).



This evaluation allows the evaluator to study the behaviour of the participant in a natural condition by using a laptop. So that the evaluation can be done in real-time there has to be internet connectivity in the evaluator's and participant's space. For this method video calls, screen sharing applications and/or a speaker and a microphone are needed so that the evaluator can view how the user is doing with the tasks. Figure 5 shows a simplified version of the setup of a synchronous remote test.

Benefits of this type of testing come from the possibility of obtaining data of users in their normal habitat, reducing the inconvenience to the participant to move to a lab and the possibility of interacting with the participant in real-life even you are not in the same space. In addition, the situation of having a modulator seams more natural than talking to one self. The main drawback is that you depend on technology for doing this, not all people may have a good computer or a good internet connectivity to undertake a proper test.



Figure 5: Synchronous remote evaluation setup

### **2.5.3** Asynchronous Evaluation

Asynchronous remote evaluation is a way of remote testing in which the evaluator and the participant are in a different space and cannot interact with each other at the time that the test is taking place, meaning that the participant and the evaluator are not just separated by space by also by time. Most of these tests are carried out using an interactive program with a virtual moderator or in a survey form (Lima, Winckler, & Freitas, 2000) (Nielsen, Schroder, Stage, & Andreasen, 2007).

Instead of evaluators, questionnaires guide the users so the time pressure for responding to a question is reduces. The questionnaire or survey is normally sent by email or post together with a consent form, instructions for the test and sometimes the link to the prototype. An example of a setup for an asynchronous testing can be observed in Figure 6, we can see that the scenarios are divided into two different moments without mutual interaction in real-time.

This method is considered one of the most cost efficient and enables a faster analysis. In addition, as no time is employed by the evaluator to carry out the tests, a bigger amount of participants can take the test and more



true results will appear. As disadvantages, the evaluator needs to take more time preparing the questions of the test as no question can be improvised, so various pilot tests are recommended. Furthermore, observational data is not received directly by the evaluator so is a problem or something occurs there is no way of correcting it. Moreover, some participants don't pay a lot of attention to surveys as they get tired of them or they don't want to write the answers down so the validity of the test may be controversial (Bastien, 2008). Finally, there is a big chance that the participants get distracted by something and don't pay full attention to the test.



Figure 6: Asynchronous remote evaluation setup

## 2.6 RELATED WORK DIFFERENCE

Studies related to Cognitive Walkthrough and Remote Evaluation have been mentioned in this chapter separately, but no study has done a Cognitive Walkthrough remotely, so there is no way to know if they are compatible. Moreover, as there was no direct indication on whether it is better to do a synchronous or asynchronous remote evaluation; This study tries to evaluate the effect of the moderator (being present or not during the remote Cognitive Walkthrough) in the number and type of usability problems found, in the task performance of the participant and in this satisfaction level. This will give the scientific community and businesses the opportunity to benefit from remote testing when the decided usability evaluation is a Cognitive Walkthrough.





## **Chapter 3. MIGRANTECH**

### 3.1 OVERVIEW

Migrantech is a project started by the Fondazione Bruno Kessler in Italy and University of Haifa in Israel that aims at identifying the effect of computer-mediated contact in the acceptance of immigrants in society. Migrantech's research hypothesis is that Joint Narratives can reduce stereotypes and hostile attitudes; this is based on the social constructionist theory (Zancanaro M., et al., 2008). This theory says that intergroup dialogue is vital for the participant's transformative process through which participants deal with disputes using self-expression and listening to others. Digital software backing intergroup dialogue have shown positive effects, as well as cooperative tasks lead to more positive results than some meetings. Concerning this, using narrations to promote reconciliation is a recognised method that needs further research in the area of solving a violent conflict. This is why the principal part of the project is the creation of a tool called Communics which supports the creation of joint narratives by two persons that don't speak the same language in order to solve conflicts (Zancanaro, Stock, Eisikovits, Koren, & Weiss, 2012).

### 3.2 COMMUNICS

Communics is a desktop application designed to foster interaction by pairs of peers with the objective of supporting collaborative storytelling in a multi-cultural and intergroup setting. The final aim is to find reconciliation in social and ethnic conflicts. With the use of Communics, two culturally-different participants can create a narrative in the form of an illustrated story on the topic of the conflict. The illustrated story is created by taking turns when designing the vignettes with the aid of backgrounds, characters (with different expressions and body postures), objects and predefined language expressions (for translation purposes).

For login into Communics, the two participants of the storytelling must be given a session number so that the results collected by the software can be stored and properly labelled to be analysed by a professional at the end. This session number is provided by a session manager software (Figure 7), which links the resources that are available with the two participants and their corresponding language. The session number is sent to the participants that then, to enter Communics, have to log in filling the following fields observed in Figure 8.

COMMUNICS SESSION MANAGER					×
ecology_2018may_eng_i	ta				
+ C F P F F P F P F P F P F P F P F P F P	Nome della sessione 20180519T075451 Questa sessione é un test Inizio: 7:56 AM Termine: 8:27 AM Durata: 31m 20s Numero di turni: Numero di operazioni:	Nome del partecipante per la lingua Italian (Italy) insegnante 3 Descrizione Questa sessione ha testo libero, usa testo predefini visualizza il questionario	ito e		

Figure 7: Communics' Session Manager



NI NIC		_ =
COMMUNICS 2018		
VCI 2010.10.2.2.4030		
	Session Name	
	20181002T114124	
	Player	
	Benjamin	
	Join in	

Figure 8: Communics' Log-in page

When the participants are logged in they can start creating a short story with the resources they are given. Typically those resources will correspond to a certain topic in which the two participants may find some possible controversial disagreements. The resources are specially selected by a cultural mediator or intercultural practitioner with a background in Sociology, International Studies, and/or Counselling and are uploaded to the system with the aid of an Authoring Tool (the system designed and tested in this project).

Participants take turns for creating one vignette with all the resources they want to put, this resources include: backgrounds, emotions, characters, objects and speech bubbles with text in the appropriate language of the participant. A participant cannot create 2 vignettes in the same turn; he has to wait for the other participant to contribute first. As the two participants are connected remotely through the internet, the desktop application always shows the same content to both participants. Figure 9 shows a demonstration of a participant creating a story with another that is situated in another computer.



Figure 9: Participant working with Communics

Figure 10 shows a screenshot of Communics' interface. In Figure 10 you can observe that the creation panel is situated in the centre of the screen having the possibility of viewing the two previous vignettes. The resources are situated in the bottom part of the screen and are dragged and dropped on to the creating



vignette. Once the story is finished the participants indicate it by pressing the button marked with an X in the bottom right corner.



Figure 10: Communics' interface

Communics' main component, still in development and testing phase, is an automated mediator that is in charge of monitoring the progress of the story and of fostering participants to escalate or de-escalate their contributions to solve the points of conflicts. By using this, the participants can reach an agreement on a satisfactory joint narrative that is acceptable to both participants, reflecting their identities and points of view. Last research done by the FBK was in this specific component of the tool and they found out that an automated mediator was as useful as a human mediator.

### 3.3 AUTHORING TOOL

Currently there is no software that a non-technical person could use to upload resources to Communics' data base. Up until now the content has been uploaded directly using an excel file and a data base, and this is not understandable by people with no technical background. So, for the FBK and the University of Haifa to continue developing Communics and testing new approaches they need an Authoring Tool for non-programmer users to be able to easily upload all the necessary content to Communics in order to help them with the project.

The Authoring Tool will be software that basically provides the non-programmer user a visual interface in order to upload content into the system. It will also be a tool for them to view and check all the content they have uploaded and that other profession colleagues have uploaded. They could also start creating a new set of resources by using as a base an older set of resources or even create a new resource joining the resources of two existing ones. Later more detailed information about the main feature of the system will be described in the design section.

## 3.4 ARCHITECTURE OF THE SYSTEM

The Authoring Tool was designed taking into account the architecture of the system as it had to be integrated within the existent architecture of data bases and programs. The architecture scheme is as follows (Figure 11):





Figure 11: Diagram showing the Architecture of Communics project

Essentially, the non-programmer user gives a file with lots of images and a list of text bullet points to the technician to upload into the permanent data base. Then, whenever he wants to stat an experiment, he creates a session number for two participants and uploads it in the data base related to a specific resource. The participants have all the content available in their desktop application and can play around with the resources in order to create a story by logging in with that session number. The interfaces of both participants are connected to the internet so that they can see what the other is doing. When the participants finish the story the results are sent to the Permanent database so that they can be seen in the Session Manager by the cultural mediator or intercultural practitioner with a background in Sociology, International Studies, and/or Counselling.



## **Chapter 4. DESIGN PROCESS**

## 4.1 OVERVIEW

As mentioned before, this section was the one developed during the internship at the FBK. It is important to summarise the design process of the Authoring tool in order to understand properly the tasks selected in the usability evaluation, to identify false usability problems found that may be 'intentional' because of technical reasons and to make future improvements on the design after the Cognitive Walkthrough. The design process was supervised by Massimo Zancanaro, Gianluca Schiavo and Alessandro Cappelletti throughout a series of meetings in different stages of the design. In this chapter the design process will be summarised and explained in chronological order, starting from the information received in the first meeting until the final functional prototype developed in Axure.

## 4.2 **PROJECT DEFINITION**

In order to define the functionalities that the new Authoring Tool needed to work as desired, it was decided to meet a couple of times with the team that had been working on the project previously. First meetings were about the context of the Migrantech project. Later, Communics desktop application was presented and the functionalities and features of the program were described. In addition, the type of resources that had to be managed were given to the designer as an example. Having seen all of this, the instructions were to design an interface that allowed a person with no technical background administrate the resources that the participants of Communics will have to use in order to create a story.

In the beginning it was not very clear if the Authoring tool had to work online and offline or just offline, and if could aloe instant collaboration as for example Google Drive. It was decided to treat these questions further on, as the important thing was to create a first version of the software to continue investigating, and this type of features can always be implemented in the future if the first design allows it. In addition, examples of different Authoring Tools and Content Managers were searched on the internet in order to see what the common main features that these tools have.

## 4.3 FIRST PAIN POINTS

The first pain points were created more or less at the same time as the first fast paper prototype in order to help thinking about the actions that a person does when administrating some content. They were also created according to the type of content that had to be managed based on the resources that Communics' team members had supplied. Moreover, they were created for the interface to be as simple as possible for a non-technical person and contained the basics. They were thought specially in order to solve the problems of the previous method of having to use a data base and an Excel sheet. They were as follows:

- 1. It is difficult to know what the format of the elements uploaded has to be. It varies depending on the type of resource.
- 2. It takes time to know what types of elements are allowed to be uploaded.
- 3. It is not possible to have a general view of all the resources.
- 4. It is not possible to inspect the elements inside the type of elements in each resource.
- 5. It is difficult to edit a resource you are working on.
- 6. It is difficult to select what element you want to delete inside a resource without a general view.



## 4.4 PAPER PROTOTYPE

The purpose of the paper prototype was to help think about the pain points and to have something to show and to work on in the following meeting in order to elaborate on the functionalities. The paper prototype had the appearance shown in Figure 12 and Figure 13.

	Communics Q (8)
Communics	List of Resources Exemption - Helew Description -
D Remember me Forget pussual? LOGIN	automatics Emojis Text Objects
Communics R B	New Resource - Name Reary Adhils FALLSH Relegiounds Characters Emgis Objects Teat
HEW ERAT COPY	t open Search on web From AC R mm 2 selected BOXED

Figure 12: Paper prototype (Part 1)

New resource - Norme (Bone lokils FELLESH)	Na, lessure - Nome bosnaktis/ALASH)
Bickglauds Chanders Emgis Objects Text	Becksjounds Chambers Emojis Objects Teart
+ Search from on web From PC	
Play and Dop Files	A which dok the second
hav lesarce - Neme Resarce Ahis FARESH	New Resource - Dano
billionals chandes Empire Objects Text	N. A. V. F. J.
enstable Habren Egisst Set Adrew Sent. @	Petris Name
Wonkout Ibre akjons Delet kenns	Assuption Longinge 1 Longinge 2 DOWE

*Figure 13: Paper prototype (Part 2)*


Summarising the macro decisions, they were the following at this point:

- 1. When selecting the elements to upload, if some are not compatible with the type of element, an error message will be shown.
- 2. There is a menu bar in the top always indicating the type of resources that exist and showing in which one you are working on.
- 3. There will be a list of all the resources with some basic information displayed in some cards.
- 4. The elements inside a type of element (e.g. images of the backgrounds) will be displayed as if they were on a folder from a computer and will be displayed in small and if you click on them in big. The text will be treated as a table.
- 5. There will be a button that allows edit the resources.
- 6. It will be allowed to delete resources and elements inside resources.

#### 4.4.1 EXPERT CRITIQUE

After showing the paper prototype some of the recommendations/things to think about told by an expert in design were the following:

- A 'New' button cannot be repeated all over the program, it is not consistent.
- Careful with the vocabulary used, if a button says 'Finish', does it mean that the resource is completed? Or that you are saving? You have to define what functionality it has.
- Thing about hoe to difference resources that are completed from the ones you are still working on.
- It needs some overview statistics for the creator to evaluate how is he doing because if not there is no sense of classifying the sentiments individually.
- Think about the first thing the user needs to do when creating a resource and try to guide him in a coherent order on how to fill the content.
- In the text there has to be an area in which the text is always in English for everyone to understand the other languages.
- For adding a new row in the table it is not consistent that you have to right click if for the backgrounds there was a specific button for this.
- What if the person is working on the resource and the program crashes?
- When deleting for example, add some confirmation in case a button is pressed by error.

## 4.5 FIRST DIGITAL PROTOTYPE

The first prototype done with the computer was done using PowerPoint. This was because the aesthetics of the interface was not yet decided, so a fast an easy tool was chosen. As there were no indications in the start as of what style to follow, the first prototype was inspired by google design guidelines. The purpose of it was to explain add/change some macro decisions of the design in order to correct the last paper prototype and to start focussing more on the micro decisions.

The macro decisions that changed of that were added where the following:

3. There will be a list of all the resources with some basic information displayed in the cards. This information includes as summary of the positive/negative sentiments for each resource.

7. The list of resources will be divided into resources that are completed ('Finished') and the ones that still need to be completed ('not finished').

- 8. The menu on the top will direct the sequence of things to fill in for the user.
- 9. Add confirmation panels to important actions.

All of the decisions were taken into account for the new interface design. In the end, the next prototype had the following appearance (Figure 14) (Figure 15):





Figure 14: First Digital Prototype (Part 1)





Figure 15: First Digital Prototype (Part 2)

As it can be observed, some micro decisions are more visible with this prototype:

- The flipping of the cards in order to do an action on that card.
- Adding a new column for categorising the texts.
- Adding a new column for the description of text.
- Adding a '?' sign to help people remind in what language they have to write there.
- Putting a bottom of 'New' separate from the resource.
- Adopting google style of pivoting also for classifying the resources.



- Integrating the details of the resource in the top menu of the type of elements and putting it in first place so that the details are filled first
- Adding an error message if the user tries to upload content before putting a name to the resource.
- Add another button of 'save' so that the resources are added to the not finished section.

### **4.5.1 EXPERT CRITIQUE**

After making a presentation of the new functionalities and how to present them, an expert critique formed by the head of Intelligent Interfaces and Interaction research unit at FBK and a psychologist and user experience researcher in the FBK made the following suggestions:

- It is better to put things that the user can directly see than him to discover the new things by putting the mouse over.
- Try to maintain all the buttons and elements that have the same function in the same area of the screen.
- Design some command bars for common actions.
- Inside a category there can be more subcategories, think about how this can be solved in a table creation.
- The appearance of the program has to follow the Universal Design Windows Guidelines (Windows, Design Universal Windows Guidelines), because other programs of the suite use that and the coding was done with UWP apps.
- Try to think about how to implement this in the architecture of the whole system.
- Deleting a resource has to be hard for the user because it is not a normal action and you have to see if it is compatible with a possible future collaboration and offline working system
- Try to show as less number of errors as possible, instead try to block the actions the user cannot do.

# 4.6 NEW ARCHITECTURE OF THE SYSTEM

The architecture of the system will look in the following way:



Figure 16: Architecture of the system with the Authoring Tool

The changes that the system will receive are the ones coloured in orange in Figure 16. The temporary data base will be located in the local computer where the Authoring Tool is installed. Every time the Authoring



Tool is opened the temporary data base will be updated by the permanent data base in search of new finished resources, which will also be charged on the graphical interface of the Authoring Tool. Whenever the user saves a resource for continue working another day, it will be saved on the temporary data base so that the other users don't have access yet to it as it is not yet completed. The not finished resources will be charged into the graphical interface from the temporary data base that will be backing up the work every 1 minute. In case the Authoring Tool crashes, all the content will appear again in the graphical interface as the modifications were saved, even if the user didn't have internet.

# 4.7 PAIN POINTS COMPLETED

After some meetings to put together the functionalities of the interface, to make the interface fit with the other graphical user interfaces already implemented in the other applications and to know how to integrate the functionalities with the actual architecture of the system, some pain points were redefined and new ones appeared:

- 1. It is difficult to know what the format of the elements uploaded has to be. It varies depending on the type of resource.
- 2. It takes time to know what types of elements are allowed to be uploaded.
- 3. It is not possible to have a general view of all the resources.
- 4. It is not possible to inspect the elements inside the type of elements in each resource.
- 5. It is difficult to edit a resource you are working on.
- 6. It is difficult to select what element you want to delete inside a resource without a general view.
- 7. It is difficult to know how edit and create tables of text with categories and subcategories.
- 8. There is no way to have a detailed summary of the sum of all the positive and negative elements in a resource uploaded.
- 9. There is confusion about the minimum number of types of elements that a resource can have.
- 10. It is not possible to distinguish if a resource is finished and ready to use or not.

## 4.8 DESIGN DECISIONS FOR FUNCTIONAL PROTOTYPE

The functional prototype was designed with Axure Version 8 (Axure), which is a program that enables the designer to create and test a prototype without coding. The whole appearance of the prototype was done following the Universal Design Windows Guidelines. As a consequence, the page layout that fits the content that this project has to display is the one shown in Figure 17.



Figure 17: Windows Page layout (Windows, Page Layout)

As you can observe, the page layout is divided in:

- A navigation pane in which the list of resources will be displayed according to the category they follow. This panel can be expanded and collapsed.
- A content pane in which the content will be displayed according to the resource pressed in the navigation pane. The union of this two will form a Master Detail View in which both panes are fixed and have vertical scrolling. The scheme of a Master Detail View is recommended for lists that contain images and text (Windows, Windown Master Detail View) as it can be seen in Figure 18.

•===	-
•	
•===	

Figure 18: Windows Master Detail View (Windows, Windown Master Detail View)

In addition, inside the Content pane there will be a Top Navigation bar so that the users can navigate between the types of elements of a resource. It will have the following appearance (Figure 19):





Figure 19: Navigation Panel inside the content (Windows, Page Layout)

• A command bar for the general actions that can be done to the selected resource. If the commands are a lot you can also add an overflow menu as seen in Figure 20.



Figure 20: Command Bar (Windows, Page Layout)

This was the type of layout selected because it is a well-known layout by anyone that receives emails, so the interface will be easier to learn as they will find similitudes with email softwares. In addition, it was a god solution for the user to receive the most information at a glance without having to navigate a lot in the interface, as the main cognitive task for the user is to view the content available.

The appearance of the prototype showed to the experts previous the evaluation wasn't so detailed in content as the one that is going to be explained now. In the end, the prototype evaluated in this master thesis and the reasons for this design were the following:



Communics Authoring Tool										- 0	×
<u>ب</u> ج	Overview Text	Backgrounds	Characters	Objects	Emojis		Duplicate	Close Pane	ál	Statistics	
List of resources All V											
Not Finshed	Resource d	etails									
Searching for a Job 19/7/2018 For israeli students that are searching for a job in Italy.	Resource name The City										
Finshed	Percurse description										
The City 30/1/2018 This resource is for erasmus students that come from a small city to a big one.	This resource is for erasn come from a small city to	us students that a big one.									
	Language 1 English										
	Language 2 Italian										

Figure 21: Principal View 1

Figure 21 shows the real appearance of the program using the Master Detail View. The resources (Finished and Not Finished) are located in the left inside the Navigation Pane and they are listed and grouped according to their category. In the top of that pane you find a search bar in case there are many resources and you don't find the one you are looking for. There you can also find a tab to filter the resources according to the type and a '+' to create a new resource. The information displayed for the finished resources is the name, the description and the date in which the resource was finished. In addition, as we select one resource (The City in this case) the element gets highlighted in a grey colour that corresponds to the grey tone for selected items in windows. At the same time, the content pane switches to display the information regarding that resource, showing the overview information first. Then the users can inspect what is inside that resource using the pivots of the top navigation menu. Moreover, the Command Bar corresponds to the actions that can be done when selecting a finished resource. These are to: Duplicate the resource, Close Pane and view the statistics for that resource. In the case the user wants to duplicate the selected resource, the item of the navigation pane will be doubled and go up to the not finished section to get ready for being edited (Example in Figure 22).



Communics Authoring Tool			- 0	×
+ ٩	Overview Text Backgrounds Characters Objects Emojis	e 💽 Close Pane	Statistics	
List of resources $$\rm All$~{\ensuremath{\sim}}$$				
Not Finshed	Resource details Resource name			
(D)Searching for a Job (7/2018 For issaeli students that are sear inner r a job in Italy. from a small city to a big one.	Searching for a Job Resource description For israeli students that are searching for a job in Italy.			
Searching for a Job For israeli students that are searching for a job in Italy.	Language 1 English			
	Language 2 Hebrew			

Figure 22: Duplication action

When selecting a not finished resource from the navigation pane (Figure 23) the same things will happen as with the finished one with the exception of two things. The content displayed in the content pane will appear as if it was in edit mode but the fields were blocked. This was done so that the users recognise they can still edit the information. The other difference is that the Command Bar contains an extra button to edit the resource. This is basically because a resource that hasn't been finished has to be able to allow continue working on it. The finished resources cannot be edited as they are already in the main data base and can be in use by other sessions. The only way someone can 'edit' a finished resource is to duplicate it and then edit it by changing the name and the other elements. This was done so that users don't have to waste time uploading the same content for modifying small details.

If users are interested in downloading some of the elements inside the resources that someone else has uploaded into the system in order to add it to their set of resources they can also do so by selecting the element, then the download button will de-block and they can click on it to save it wherever they want in their computers for later uploading it (Figure 24).



Communics Authoring Tool							- 0	×
+ م	Overview Text Backgrounds	Characters Obje	ects Emojis	Dedit Edit	Duplicate	Close Pane	Statistics	
List of resources All V								
Not Einched								
NUTHISING	Resource details							
Searching for a Job 19/7/2018 For israeli students that are searching for a job	Resource name							
in Italy.	Searching for a Job							
Finshed	Resource description							
The City 30/1/2018 This resource is for erasmus students that come from a small city to a big one.	For israeli students that are searching for a job in England	9						
	Language 1							
	English							
	Language 2							
	Hebrew							





Figure 24: Download action

The overview for the statistics of a resource is displayed as a side right pane that slides left when clicking on top of the Statistics button (Figure 25). The statistics displayed show all the possible ways in which you can group the sentiment statistics.

Communics Authoring Tool	Overview Text Backgrounds	Characters Object	s Emojis	C Edit	Dupli	icate	Close	Pane	- fi Stati	stics
List of resources All ~				Statistics						
Not Finshed	Resource details				English + sent.	English - sent.	Italian + sent.	Italian - sent.	Neutral sent.	Total
The City V1 30/6/2018	D			Text	2	6	8	0		9
This resource is for erasmus students that come from a small city to a big one.	The Cite V2			Backgrounds	0		0	0	10	10
	The City V2			Characters	3	6		2	3	9
The City V2 29/6/2018 This resource is for erasmus students that come	Resource description			Objects	2	3	3		3	7
from a small city to a big one.	This resource is for erasmus students that come from a small city to a big			Emojis	2		2	1	2	5
Finshed	one.	4		Total	9	16	14	3	19	
There are no Finished resources	Language 1 English									
	Language 2									
	Italian					_	-			
					<					

università degli studi di trento

Figure 25: Statistics pane

When creating a new resource the tabs on top of the content will be blocked until the user has inserted all the required fields to document the resource (Figure 26). This is done so that the resources are well documented to avoid the user from forgetting this important step before completely finishing the resource (avoid error messages). When all the fields are filled, then the top pivots de-block. It happens the same with the 'Finished' and 'Save' buttons as you cannot save a resource with no content and you cannot finish a resource without the minimum elements added. For the saving button to de-block the user just has to fill in all the fields in the overview and for the finished button the user has to add at least one text and one background.

🗧 Communics Authoring Tool				- 0	×
Overview Text Backgrounds Characters Objects Emojis	Save	Delete	→ Open Pane	Statistics	
Resource details					
Resource details					
Resource name I					
Resource description					
Language 1					
Language 2					

Figure 26: Overview fields

For adding an element you can click the add button or you can drag and drop the elements. The buttons that are not available for using in that moment they are blocked to help the user work faster and to avoid misunderstandings (Figure 27).



← Communics Authoring Tool					-	o ×
Overview Text Backgrounds Characters Objects Emojis	🛱 Finished	Save	Delete	→ Open Pane	Statist	ics
+ Add Character						
						-
						i.
_						1
<b>—</b>						4
						i.
						1
Click Add Character or Drag it	Here					
						1
l						

Figure 27: Adding a character

When the elements are loaded into the system they are displayed like in Figure 28. Each card has its image and then the corresponding fields to be filled in (Name, language 1 sentiment and language 2 sentiment). In addition it has a checkbox that if selected, it de-blocks the delete and download buttons in the command bar corresponding to the type of element. All the checkboxes in the type of element can be selected at the same time by using the select all button. The filter tab helps users to display the elements according to their sentiment preferences in case they want to have a more detailed view of the elements when having big amounts of data. This interface is the same for all tabs except for the text.

Communics Authoring Tool							- 0	×
Overview Text Backgrounds Characters Obj	ects Emojis		🖄 Finished	Save	🗐 Delete	Open Pane	Statistics	
+ Add Character 👘 Delete 🗹 Select All 🚽 Downlor	ad 🗸 Filter 🗸							
								î.
	Add Characters			×				1
	Look in: 🧧 characters		G 🛊 📁 🗔-					
	1	1 0		^				1
	Quick access	•						i.
								i.
	Desktop Man4.png	poliziotto con Woman1 ( piedi.png	l).png					1
	i i i i i i i i i i i i i i i i i i i							1
	Libraries							i.
								i.
	This PC							1
	Network	ii		~				1
	File name:	"Man4.png"	~	Open				ł
	Files of type:	PNG (*.PNG)	~	Cancel				1
								1
								Į.
								1
								1

Figure 28: Limit formats

So that the users don't have problems with deciding what format they can upload the files on, the format for uploading will be already predefined for them (Figure 29) and the images that don't have that format won't appear in the options for uploading.





Figure 29: Element Display 1

If you want to delete an element a confirmation dialogue will appear in order to confirm you action, as this is an important in order to not loose information (Figure 30).

← Communics Authoring Tool			- • ×
Overview Text Backgrounds Characters Objects	Emojis	🗇 Finished 🔄 Save 🔟 Delete	→ Open Pane 📶 Statistics
+ Add Character 🗊 Delete 🗹 Select All 🛓 Download $ abla$			
Î 🕺			
Black Bodyguard.png Black Man	White Bodyguard.png Landlord	White Man	Black Man
English sentiment Negative <b>T</b> English sentiment Neutral <b>T</b>	English sentiment and the sector and	English sentiment Neutral V	English sentiment Neutral <b>V</b>
Hebrew sentiment Negative  Hebrew sentiment Neutral	Hebrew sent Delete file(s) permanently?	Hebrew sentiment Neutral	Hebrew sentiment Neutral V
	If you delete this file(s), you won't be able to r	ecover it.	
	Do you want to delete?		
	Delete Cancel		

Figure 30: Delete element confirmation

For the text section, the interface is more or less the same but it has an add category/subcategory button for classifying the test depending on different scenarios. This button changes from Add Category to Add Subcategory when a checkbox is selected because subcategories always belong to a category (Figure 31). The table quite straight forward with writing fields for inserting the text and selection fields for choosing the sentiment.



)vervi	iew	Text Backgrounds Characters O	bjects Emojis	🖓 Finished 📳 Save 🕅 I	Delete 🕞 Ope	n Pane / Statisti
– Ado	d Row	🖧 Add Subcategory 🔟 Delete 🗹 Sele	t All 🖓 Filter 🗸 🚺			
		Ruthie and Avi came for a job interview a the restaurant	t Ruthie and Avi came for a job interview at the restaurant	רותי ואבי הגיעו לראיון עבודה במסעדה 2	Neutral	▼ Neutral
-		Ruthie and Avi argued with the shift manager	Ruthie and Avi argued with the shift manager	רותי ואבי התווכחו עם מנהל המשמרת -	Positive	▼ Positive
-		Ruthie and Avi came for a meeting with t landlord	he Ruthie and Avi came for a meeting with th landlord	e רותי ואבי הגיעו למפגש עם בעל הדירה	Neutral	<ul> <li>Neutral</li> </ul>
2	Desc	Ruthle and Avi came for a meeting with t landlord	Ruthie and Avi came for a meeting with th landlord	e רותי זאבי הגיעו למפגש עם בעל הדירה	Neutral English sent.	Neutral     Hebrew sent.
2	Desc The Avia	Ruthie and Avi came for a meeting with the landlord	Ruthie and Avi came for a meeting with th landlord English text The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	e רותי ואבי הגיעו למפגש עם בעל הדירה Hebrew text בעל המסעדה קיבל את רותי ואבי לעבודה והתנצל על חוסר הנעימות	English sent.	Neutral     Hebrew sent.      Negative

Figure 31: Element Display 2

When the user wants to stop working and continue working the next day he can click 'Save' (Figure 31). The action for showing the user that his file has been saved properly will not only be to show him a message but also to open the navigation pane and physically show him the new resource appearing in the not finished section (Figure 32).

Communics Authoring Tool		- 0	×
+ م	Overview Text Backgrounds Characters Objects Emojis 🖉 Edit 🖺 Duplicate 🕞 Close Pane :	Statistics	
List of resources $\qquad$ All $\vee$			
Not Finshed	Information Resource details		
University 278/2018 Inside and Outside University Scenarios for foreign students	Resource name		
Finshed	University		
The City 30/1/2018	Resource description		
from a small city to a lig ine.	Inside and Outside University Scenarios for foreign students		
V	Language 1		
'	Italian		
	Language 2		
	Spanish		

Figure 32: Saving action

When the user wants to finish the creation of a resource for not modifying it more a confirmation message will appear warning him because it is a critical step that cannot be reversed unless duplicated (Figure 33). The action is confirmed by showing the resource move in the navigation pane from the not finished to the finished section.





Figure 33: Finish action

In the last expert critique it was decided that the prototype had to be adapted with the real content that will be uploaded to Communics so that a more detailed evaluation could be done about its usability (As most of the big design problems were already solved). In addition, it was agreed to concentrate on the learnability of the system as the project team wanted to avoid training sessions. So in the following chapter the methodology for doing the usability evaluation will be explained. The methodology section will also focus on preparing an experiment to answer the research question proposed at the start of the project.





# **Chapter 5. RESEARCH METHODOLOGY**

# 5.1 OVERVIEW

According to Matera et al. there are six main steps that have to be thought and planned before starting an evaluation (Matera, Rizzo, & Carughi, 2006). They are fundamental for minimising mistakes and to elevate the reliability of the collected results. In the following paragraphs the fundamentals of these six stages will be described.

**Defining the evaluation goals:** It is very important that the person that is designing the test has clear the objectives that he wants to achieve when completing the evaluation in order to design an evaluation that is suitable for achieving those goals.

**Choosing the appropriate metrics:** Before starting the test, the evaluator has to have clear what are the exact parameters they will need to measure. For example, task performance, number of problems found and satisfaction are the most commonly used ones.

**Choosing the appropriate data collection methods:** There are lots of methods for evaluating a system. The one that the evaluator chooses has to match with the type of usability problem you want to find. The procedures have to be followed as describe by experts.

Selecting the participants for the test: When selecting participants for the test, the evaluator has to think about the number of participants they need, the relevance of the participants and their experience. Other interesting data to document is their field of study, their age range and their nationality.

**Task Definition:** Normally, the tasks selected have to be correlated with the most important actions the user has to perform in the program. But this depends on the purpose of the evaluation, because maybe the tasks have to be more related to testing the innovative features of the interface, testing the features the designer are not sure about, testing critical tasks...

**Preparing the test materials and equipment:** before the experiment, the evaluator must check if all the necessary materials for the test are ready (consent forms, instructions, observation sheets, programs...). For checking this and for knowing how long the evaluation is going to take it is recommended to carry out a pilot test.

All of these points will be taken into account and adapted to this study for designing the experiment that will be detailed in the following sections. As there is a usability evaluation of an interface and a study on the variation of the methodology used to carry out that usability evaluation taking place at the same time, the details for each will be discussed separately on each section.

# 5.2 GOAL DEFINITION

### 5.2.1 FIRST GOAL

The main goal of this master thesis is to evaluate the usability of Communics' Authoring Tool (prototyped during the internship period) using the most appropriate usability method for the project conditions and to find out some usability problems to make future improvements to the interface.



## 5.2.2 SECOND GOAL

The second goal of this master thesis has more to do with experimenting with the evaluation technique used to evaluate the design interface. This is, to find differences between synchronous and asynchronous remote usability testing when performing a Cognitive Walkthrough. In other words, to see how the moderator of the test influences effectiveness of the inspection.

# 5.3 METRICS

### **5.3.1 METRICS REFERED TO THE FIRST GOAL**

The pain points of this project were related to the difficultness the non-technical users had in the past for learning how to upload content into Communics. So the main requirement that has to be fulfilled by the interface is that it has to be easy to learn how to use. This condition corresponds to evaluate the learnability of the interface, so the main usability attribute that a method has to evaluate is the learnability. If this attribute is optimal, the users are able to interact with software as fast and effortless as possible.

#### **5.3.2 METRICS REFERED TO THE SECOND GOAL**

In order to assess the value of a usability evaluation and to contrast the effectiveness of two evaluation methods it is vital to define what values have to be measured and compared. A literature review was carried out to examine what are the criteria that others used for comparing usability methods. The result of this search was that there are many different ways and that there is not a standard method for this as researchers focus their studies in different areas. Nevertheless, the metrics that were used by most of the studies were: the number and types of usability problems found, the task performance and the participant's satisfaction (Andreasen M. , Nielsen, Schrøder, & Stage, 2007) (Alghamdi, Alroobaea, Al-Badi, & Mayhew, 2013) (Brush, Ames, & Davis, 2004) (Thompson, Rozanski, & Haake, 2004). This is why in this study the three metrics mentioned are used.

#### 5.3.2.1 Number and Types of Problems Discovered

The number of problems discovered has to do with the total amount of usability problems found by each variation of the inspection method. The types of usability problems are classified according to the severity of them (crucial, important or minor) and according to the number of problems found that are unique for each method.

#### 5.3.2.2 Task Performance

Measuring the task performance implies to measure the task completion and the time spent on tasks. The task completion has to do with the percentage of tasks completed correctly by the evaluator. The time spent on tasks will start counting from the moment the participant sees the first screenshot, until he answers the last question.

#### 5.3.2.3 Participant Satisfaction

Participant satisfaction is a very important factor to measure how the participant has felt during the session that maybe could have influence the final results. It has been a key metric in most of the studies for trying to understand the results obtained.



# 5.4 METHODS

### 5.4.1 METHOD REFERED TO THE FIRST GOAL

As the usability attribute chosen is Learnability, the method that focuses on colleting problems for this attribute is the Cognitive Walkthrough (Table 3) and for logistic reasons, the inspection method selected is taking place remotely. All of the details about the procedure of this method were previously mentioned in Section 2.4 and 2.5 and the way of combining them will be precisely detailed in the experimental procedure of Section 5.8. As a reminder, the Cognitive Walkthrough involves a process in which the participant goes through every step the user has to do in order to complete a task (tasks defined in Section 5.5) and for every step he has to answer the following questions:

- 1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)
- 2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.
- 3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.
- 4. After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.

The document prepared for the Cognitive Walkthrough session that shows the steps for every task that the participant has to evaluate can be observed in (Appendix E – Document For Asynchronous Evaluation).

Regarding the detection of usability problems, they are detected by a negative answer to any of the four questions the participant has to answer during the Cognitive Walkthrough. Then, the usability problem is first recorded in an individual usability problems report sheet (Appendix G – Template for Usability Problem Report Sheet (Individual)) that each participant has. Later, all the usability problems found by each individual participant that are the same are grouped together, classified according if they are considered crucial, important or minor usability problems and listed in the global usability problem report sheet (Appendix I – Template for Usability Problem Report Sheet (global)). The classification of the usability problem is chosen by the number of times it has been detected and by the seriousness for the users. According to the global list of problems found, the design changes are recommended.

Method	Phase of Product Development	Usability Attributes	Training	Overall Costs	Requires Users?
Heuristic evaluation	Requirements Conceptual design Detailed design Implementation	Learnability Efficiency Consistency Errors Flexibility	Low	Low	No
Perspective-based UI inspection	Conceptual design Detailed design Implementation	Learnability Efficiency Consistency Errors	Low to medium	Low	No
Cognitive walkthrough	Conceptual Design Detailed Design Implementation	Learnability	Medium to high	Medium	No
Pluralistic walkthrough	Conceptual design Detailed design Implementation	Learnability Efficiency Consistency Errors Flexibility	Medium	Medium to high	Yes
Formal usability inspection	Requirements Conceptual design Detailed design Implementation	Learnability Efficiency Consistency Errors Flexibility	High	High	No

Table 3: Aspects that help choosing an inspection method (Wilson, 2014)



At the end of the Cognitive Walkthrough, the participant has to answer two questions in a short interview that have nothing to do with the walkthrough itself but with the general functionalities of the system. This is done to gain further understanding about the ease of interaction and to collect further relevant information about future functionality improvements. The questions are the following:

- 1. Could you summarise what you've seen and analysed by saying two good and two bad things about the product?
- 2. Not thinking about practical terms, what would you think a system like this should do that it doesn't?
- 3. In general, do you think the functioning of the system is easy to learn as regards to the similarity with the interface of other programs?

#### 5.4.2 METHOD REFERED TO THE SECOND GOAL

As mentioned before, the values that are measured are: the number and type of usability problems, the task performance and the participant satisfaction. These metrics will be collected by the use of the following techniques.

#### 5.4.2.1 Number and Types of Problems Discovered

The number of problems discovered for each variation of inspection is shown in the synchronous vs. asynchronous usability problems report sheet (Appendix H – Template for Usability Problem Report Sheet (2 methods)). The problems are collected from the individual usability problems report sheet (Appendix G – Template for Usability Problem Report Sheet (Individual)) that each participant has and grouped according to similarity and type of test variation. The synchronous vs. asynchronous usability problems report sheet also includes a classification of the type of usability problems found (crucial, important or minor) according to the severity and the number of times it has been detected. Evaluating the level of usability problems found by a specific variation of the inspection helps for pointing out the degree of problems that method can detect. The unique number of usability issues found by one method is also noted by selecting the usability problems that the other has not.

#### 5.4.2.2 Task Performance

The task completion percentage is identified by going through all the questions of one task of the Cognitive Walkthrough for a participant and seeing if there are some questions that have not been answered correctly. A question that is not answered correctly is one that is empty, one that it is a simple 'no' with no explanation or one that has a wrong answer because of a misunderstanding of the task from part of the participant. The task completion is calculated as the total number of questions answered correctly per participant per task divided by the total number of questions per participant per task x 100. After the individual task completion percentages are calculated the average is done grouping all the individual percentages of one method by doing the mean. In the end the average task completion rate for synchronous and for asynchronous method is calculated so that they can be compared.

The time spent on tasks is measured by recording the starting and end time of every task for each participant while doing the Cognitive Walkthrough. Then the difference in time is calculated and the total number of minutes for doing a task is noted. The time for each task per participant is plotted in a graph to compare the evolution of the results. The average time for both types of Cognitive Walkthroughs is also calculated.

#### 5.4.2.3 Participant Satisfaction

The participant satisfaction has to do with what the participant feels while doing the Cognitive Walkthrough that may have influence his performance. This has been a metric used in most of the studies for trying to



understand better the results obtained. For evaluating this, an online survey done with Google Forms is sent to the participant to fill out just after the walkthrough (Appendix F – Post Questionnaire about the Cognitive Walkthrough). The evaluation form designed has five Likert Scale questions that asses the length, the pressure, the distraction, the comfort and the boredom of the participant. The question uses a 5 point scale that starts in "not at all..." and finishes in "extremely...". This method is used because it is one of the most reliable methods to measure perceptions and opinions (SurveyMonkeyAuthors, 2018).

After each Likert Scale question the following question is asked: "Do you think this feeling influenced the completeness of your answers in a positive, neutral or negative way? (Regarding the previous question)". This question wants to find out if what they are feeling during the test influences or not the participant's performance. In addition, they are asked if they feel they have contributed to finding usability problems and if they would be willing to do a remote Cognitive Walkthrough in the future. Finally, participants are asked to write some comment/suggestion about the Cognitive Walkthrough.

### 5.5 TASK DEFINITION FOR THE WALKTHROUGH

The task definition focuses on the main activities the end user would perform while using Communics' Authoring Tool. The tasks chosen are related with the pain point definition used for the design of the prototype as it is very important to evaluate the key functionalities of the interface. The tasks are also designed to last no longer than 15 minutes so that the length of the test in normal conditions is approximately 1 hour. In addition, they are written in the form of a narrative story so that the evaluator takes into account the persona (Peter) described at the start of the walkthrough.

The prototype designed during the internship period was adapted and divided into five different Axure files<sup>1</sup> that were ready to perform every step of the five tasks designed. The tasks that are evaluated by the participant of the synchronous and asynchronous remote Cognitive Walkthrough are the following:

- 1. Peter left a resource incomplete last week and now he wants to complete it and upload it into Communics. In order to complete it he has to delete all the characters that are classified as "neutral" and change the predefined name of the remaining characters.
- 2. Peter wants to create a similar resource to "Searching for a job" resource but changing some text categorisation. He wants to change the Hierarchy of the table titles:

From:	<u>To:</u>
1.Narration	1.Narration
1.1. The Couple	1.1. The Couple
1.2. Other Characters	2. Other Characters
	2.1. Restaurant Crew

Then add a new table called "2.2. Officers" with one complete row of text. The resource has to be uploaded into Communics.

- 3. Peter has to compare "The City V1" and "The City V2" and eliminate the one with the highest total number of neutral elements.
- Peter has to create a new resource with 3 text examples categorised as "1.Introductory Words" and "2. Asking for directions"; and 2 backgrounds. Then save for continue working another day because he has run out of time today.

<sup>&</sup>lt;sup>1</sup> https://drive.google.com/drive/folders/10tGVqov4snoWwX8GTr37ZQdZKI0opaGR?usp=sharing



5. Peter wants to download a background from "The City" into his computer and upload it in "Searching for a Job" another day.

## 5.6 SELECTION OF PARTICIPANTS

As mentioned in the Cognitive Walkthrough theory in Chapter 2, inspection type of evaluation methods need around 2 to 3 participants. For this study we used 2 for the remote synchronous Cognitive Walkthrough and 2 for the remote asynchronous Cognitive Walkthrough. All the selected participants have prior experience with carrying out usability tests. The participants were asked to fill in an online questionnaire to obtain some background information about the participants such as country of origin, gender, previous experience with Cognitive Walkthroughs, years of usability experience and job position. This online Google Form questionnaire was Part A of the whole study and was sent before the participants were divided into synchronous or asynchronous groups. The questions asked in the questionnaire can be seen in Appendix C – Participant Survey and the information gathered was analysed and divided into the following:

	Synch	ronous	Asynchronous		
Evaluator N°	1	2	3	4	
Origin	Spanish	Dutch	Dutch	Spanish	
Gender	Female	Male	Female	Male	
Job Title	UX Consultant	UX Researcher	HCI Researcher	UI/UX Designer	
Years of Usability Experience	3	2	3	3	
N° Usability projects per year	5	7	5 6		
Cognitive Walkthrough experience?	Yes	Yes	Yes Yes		

Table	4:	Particip	ant Cla	ssification
1 4010	<i>'</i> · ·	1 an neup	and Crea	ssification

As you can observe from Table 4, the participants are equally divided according to expertise, gender and origin. In addition all of them had done a Cognitive Walkthrough before. The level of usability expertise of the participants is medium and enough to carry out a Cognitive Walkthrough.

# 5.7 MATERIAL AND EQUIPMENT

All the material was prepared and tested by doing a pilot test before the real evaluation was carried out. The material that was prepared for the test was the following: emails with important information and reminders, participant Google Form questionnaire (Appendix C), consent form (Appendix A and Appendix B) for both type of evaluation, Axure prototypes, synchronous remote Cognitive Walkthrough script (Appendix D), asynchronous remote Cognitive Walkthrough questionnaire (Appendix E), open questions (Appendix K) and a post online Google Form questionnaire about the walkthrough (Appendix F). For the synchronous test the video call program used was Skype as it was easy to share the screen with the participants and all the participants has a Skype account. The recording program used was Apowersoft Screen Recorder that recorded the video and audio from the computer and the sound from the microphone's computer also.

Before the real evaluation started, all the materials and equipment were tested in a pilot test with another person that acted as a participant of the test and had nothing to do with the study. No information about this test was saved; just the sections of the corresponding material were corrected according to what had



happened in the pilot test and the time for carrying out the evaluations was noted. The pilot test showed that some of the tasks were not explained properly and were reformulated in a more understandable way giving more details about the context. It also showed that more information about the context of use of the Authoring Tool was needed and that some of the questions of the post questionnaire needed reformulation.

### 5.8 EXPERIMENTAL PROCEDURE

The procedures for the synchronous and asynchronous remote evaluation are quite similar in terms of information, but the way of displaying the information and of carrying out the study changes. The part that is exactly the same for both is the part of participant identification. First an email was sent to the participants with some general information about the study and asking them if they were interested in participating in the study, together with a link to the online questionnaire "Part A – participant survey" (Appendix C) in order to evaluate if they had the profile for participating. Later, the participants that responded to the email were classified for doing the synchronous or the asynchronous test according to their expertise and characteristics. Then, an email was sent to inform them what type of Cognitive Walkthrough they were going to do, how much time they were going to need and asking them when they had spare time to do the evaluation. After this the procedure for both evaluation methods diverged. The common timeline can be seen in Figure 34 above.



Figure 34: Common Experimental Procedure Timeline

#### 5.8.1 SYNCHRONOUS REMOTE EVALUATION

Once the available dates from the participants of the synchronous evaluation were received, an email confirming the date and time for the Skype was sent together with a Consent Form (Appendix A – Consent Form for Synchronous Evaluation) that had to be read, signed and sent back before the session. The day before the evaluation session, a reminder was sent to the participant to remind him the appointment.

On the day of the evaluation session, the moderator checked 1h before all the Axure files for the evaluation and printed the script that had to be followed during the session, she was 5 minutes before the time with the Skype prepared for starting the evaluation. The first step was to thank the participant and to ask him how he was by doing an informal chat. The next step was to start recording Part B – Cognitive Walkthrough until Part C – Open Questions finish and to follow the script prepared (Appendix D – Script For Synchronous Evaluation). The moderator started by reminding the participant the rules of doing a Cognitive Walkthrough and explaining him the layout of the elements in the screen; with the prototype in the left and the questions that have to be read and answered by the participant for every step in the right (Figure 35). Later on, the background information about Communics was explained so that the participant could imagine better where the content uploaded through the Authoring Tool was going to be displayed. In addition, the participants listened to a description about the users of the Authoring Tool that included their knowledge with computer interfaces so that the participant had this into his mind when testing the cognitive factor.

Once all the information was clear to the participant, the Cognitive Walkthrough started by reading the first task to the participant and assuring he had it clear. Then the moderator read aloud the action of the user and



performed it in the prototype so that the participant saw the response of the system. The moderator then had to wait patiently for the participant to answer the four questions of the Cognitive Walkthrough and had to be prepared for answering any doubts about the interaction without influencing the user. This last instruction was repeated over and over again for every step that the interface had to do until the task was completed. When the task was completed, the next task was read and the same action response procedure followed until the fifth task was read and completed. The problems that were observed during the walkthrough were noted in an observation list. Finally, the open questions of Part C were asked, a final questionnaire about the walkthrough (Part D) was sent to be completed and the participant was thanked. All of the process described above can be summarised in the steps shown in Figure 36.

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$\leftarrow$	$\rightarrow$ (	3 127.0.0.1:32767/start.html#p=	home&g=1&c=1	S O	☆ ∾	🕒 🔤 🐻 i 🦓 🗄	i Ostenar 1
A	olicacio	ones M Gmail 🝐 Drive 🔀 Thesaur	us 峰 Traductor de Google <table-cell-rows> UWP [</table-cell-rows>	🖞 Esse3 📧 Blackboard 🕕 Osiris 🕌	MyUnitn	» Otros favorito	s TANA ST
← Co	nmunics	Authoring Tool				- 0 ×	
Ove	rview	Text Backgrounds Characters Object	ts Emojis	🖓 Finished 🔚 Save 🗎 D	elete 🕞 Ope	en Pane 🚮 Statistics	elp
		👸 Add Category 🗍 Delete 🗹 Select All					lode • 🧭 Delay • 📊 📑 🔗 • 🖊 •
		Ruthie and Avi came for a job interview at the restaurant	Ruthie and Avi came for a job interview at the restaurant	רותי ואבי הגיעו לראיון עבודה במסעדה ,	Neutral	▼ Neutral ▼	
		Ruthie and Avi argued with the shift manager	Ruthie and Avi argued with the shift manager	רותי ואבי התווכחו עם מנהל המשמרת 	Positive	Positive	<ol> <li>Is the effect of the action the same as the user's goal at that point?</li> </ol>
		Ruthie and Avi came for a meeting with the landlord	Ruthie and Avi came for a meeting with the landlord	רותי ואבי הגיעו למפגש עם בעל הדירה 	Neutral	▼ Neutral ▼	(e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?
		1.2. Other Characters					2. Will the user see that the action is available? (For example, if they view in that moment the
$\leftarrow$		Description	English text	Hebrew text	English sent.	Hebrew sent.	<ol> <li>Once the users have performed the action,</li> <li>Will there have users the user of the users of the use</li></ol>
		The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	בעל המסעדה קיבל את רותי ואבי לעבודה והתנצל על חוסר הנעימות	Negative	▼ Negative ▼	(For example, they know they have to press that button and the effect it will have.)
		The rest of the waiters protested against the racism of the shift manager	The rest of the waiters protested against the racism of the shift manager	שאר המלצרים מחו על הגזענות של מנהל/ת המשמרת	Positive	▼ Positive ▼	4. After the action has finished, will the users understand the feedback they get?
							(For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.)
					Crahando - 00	001/51	19:19

Figure 35: Screen layout during the Skype





Figure 36: Synchronous Experimental Procedure Timeline

#### 5.8.2 ASYNCHRONOUS REMOTE EVALUATION

When the available dates from the participants of the asynchronous evaluation were received, an email was sent for confirming the date in which the documents for the test would be sent and the day limit they had for filling them. In that same email the Consent Form corresponding to the asynchronous evaluation (Appendix B – Consent Form for Asynchronous Evaluation) was sent so that it could be read, signed and sent back to the researcher before the next email. After that, an email was sent on the agreed date containing the word document with all the instructions and spaces to fill for the participant to carry out the study (Appendix E – Document For Asynchronous Evaluation). They had to carry out the test without the aid of anything and with no distractions. In the end, when the participant sends the word document filled, an email is sent to him to thank him for his participation. A simplified timeline of this type of evaluation can be observed in Figure 37.



Figure 37: Asynchronous Experimental Procedure Timeline





# **Chapter 6.** ANALYSIS OF RESULTS

### 6.1 FINDINGS

After collecting all the information from the participants, the results were classified according to the different metrics described in the methodology (Chapter 5.).

### **6.1.1 USABILITY PROBLEMS DISCOVERED**

The usability problems discovered were found by analysing for all the participants, all the negative responses to the four questions for each step of the Cognitive Walkthrough. Then the usability problems are collected in the different usability report sheets that can be observed in the following paragraphs.

#### 6.1.1.1 Usability report sheet per participant and task

The individual usability report sheet in which you can observe the usability problems found by each participant for every task can be found in Appendix J – Individual Usability Problem Report Sheet Completed. In it you can see the exact words that the participants used to describe the issues. The summary from that sheet is the following:

- Evaluator 1 found 8 usability problems, 1 is unique with respect to all usability problems found.
- Evaluator 2 found 10 usability problems, 1 is unique with respect to all usability problems found.
- Evaluator 3 found 13 usability problems, 4 are unique with respect to all usability problems found.
- Evaluator 4 found 11 usability problems, 1 is unique with respect to all usability problems found.

Evaluator 1 and Evaluator 2 did the synchronous test and Evaluator 3 and Evaluator 4 did the asynchronous one.

#### 6.1.1.2 Usability report sheet classified by method

Synchronous		Asynchronous		
Problem Identified	Severity	Problem Identified	Severity	
Textboxes are not clear in image cards.	3	Textboxes are not clear in image cards.	3	
Not clear meaning of Finished	3	Not clear meaning of Finished	3	
The arrow near the text tables is not identifiable as indent symbol.	3	The arrow near the text tables is not identifiable as indent symbol.	3	
The table selection is not consistent with the other item selections in the program.	2	The table selection is not consistent with the other item selections in the program.	2	

Table 5: Usabillity problems classified by method



Word "Add" near subcategory is confusing	2	Word "Add" near subcategory is confusing	2
The title of the column '[Language] + "sentiment"" needs further explanation.	2	The title of the column '[Language] + "sentiment" needs further explanation.	2
Text boxes are not clear in tables.	3	Textboxes are not clear in tables.	3
Checkbox in image card is maybe not visible.	2	Checkbox in image card is maybe not visible.	2
Textboxes are not clear in table titles.	3	Textboxes are not clear in table titles.	3
The word "Text" is not recognised as a piece of text for a dialogue.	1	Missing identification of the sections that need to be finished.	1
Filter dropdown is not clear.	1	Two 'Delete' with the same symbol and everything in the same page can be confusing.	2
Confirmation message hides too fast	2	Filter button has no indication of being active or not.	3
		Missing confirmation message when elements have been deleted.	1
		Missing indication of required empty fields.	2
		When side menu is closed and you work on a pivot that is not the overview there is no possibility of knowing what resource you are working on.	2
		The "+" button is not clear that it is for a new resource	2
		Inconsistency in creating subcategories with indent and button.	3

A total of 12 usability problems were found by the 2 participants carrying out a synchronous remote Cognitive Walkthrough, and there were 3 of those that were not found by the participants that were doing the asynchronous method. The ones doing the asynchronous remote Cognitive Walkthrough found a total of 17 usability problems and 8 of them were not discovered by the other method.



# 6.1.1.3 Global Usability report sheet

Problem Identified	Severity
Textboxes are not clear in image cards.	3
Not clear meaning of Finished	3
The arrow near the text tables is not identifiable as indent symbol.	3
Textboxes are not clear in tables.	3
Textboxes are not clear in table titles.	3
Filter button has no indication of being active or not.	3
Inconsistency in creating subcategories with indent and button.	3
Checkbox in image card is maybe not visible.	2
The table selection is not consistent with the other item selections in the program.	2
Word "Add" near subcategory is confusing	2
The title of the column '[Language] + "sentiment" needs further explanation.	2
Two 'Delete' with the same symbol and everything in the same page can be confusing.	2
Confirmation message hides too fast	2
The "+" button is not clear that it is for a new resource	2
Missing indication of required empty fields.	2
When side menu is closed and you work on a pivot that is not the overview there is no	2



possibility of knowing what resource you are working on.	
Missing confirmation message when elements have been deleted.	1
Missing identification of the sections that need to be finished.	1
The word "Text" is not recognised as a piece of text for a dialogue.	1
Filter dropdown is not clear.	1

# 6.1.2 PERFORMANCE

### 6.1.2.1 Task completion percentage

Tahlo	7.	Task	compl	otion	norcon	tage f	or.	ovor	ovali	uator
uoie	/ ·	1 ush	compi	cuon	percen	ugej	01	every	evun	raior

	Evaluator 1	Evaluator 2	Evaluator 3	Evaluator 4
Task 1	100%	100%	92%	92%
Task 2	100%	100%	93%	96%
Task 3	100%	100%	96%	91%
Task 4	100%	100%	93%	98%
Task 5	100%	100%	96%	100%
TOTAL	100%	100%	94%	95%

### 6.1.2.2 Time spent on tasks

Table 8: Time spent on tasks for every evaluator

	<b>Evaluator 1</b>	Evaluator 2	Evaluator 3	Evaluator 4
Task 1	9 min	7 min	26 min	27 min
Task 2	11 min	10 min	17 min	18 min
Task 3	2 min	3 min	7 min	5 min
Task 4	4 min	7 min	14 min	11 min
Task 5	2 min	2 min	6 min	3 min
TOTAL	28 min	29 min	70 min	64 min





Figure 38: Graph comparing the time spent on tasks for every evaluator (red synchronous, blue asynchronous)

Looking at the graph we can see that the asynchronous evaluation participants (blue line) took longer than the synchronous evaluation participants (red line) for all the tasks the participants were asked to evaluate.

### **6.1.3 SATISFACTION**

### 6.1.3.1 Participant Satisfaction with the Authoring Tool

The participant satisfaction with the Authoring Tool was measured qualitatively by asking three questions to each evaluator found in Appendix K – Open Question Responses.

All of the participants thought the design of the interface helps to be quickly familiarised with the program as it has similar functionalities and symbols of other well-known programs. This makes the program to be easy to learn that was the main objective of the design.

The things that they most liked about the Authoring Tool were the clear feedback that the system gives when an action is performed and the help it gives to the users the fact that the actions that are cannot be used are disabled to the user. In addition, apart from the interface to be familiar, they appreciated that all of the elements were well structured in the interface as a whole with fixed positions depending on the functionality.

In general, the things that have to get better are the vocabulary used for some of the buttons and labels and the fact that most text fields are not visible for aesthetic reasons, but the user cannot know if he can write there some text or not. The 'Text' section was the one that generated most of the problems, especially because the categorisation was not very consistent with a button that said 'Add subcategory' and an arrow symbol that pretended to act as an indent symbol.

The recommendations for future functionalities that could be added to the tool were to create a space for painting own characters, objects and emoji or to have a function to upload them directly from google without having to download them first into the computer. Also, it would be interesting to have more space for leaving comments about the resources, rather than just a simple description in the start. Moreover, an automatic translation between columns of the tables for the text was mentioned, but always allowing the users to modify the translations as translations are not fully reliable. In addition, a Ctrl Z function would also help to fix possible mistakes. Finally, the possibility of downloading a not finished resource and send it via email to another person for him to upload it in the Authoring Tool for finishing it was also proposed.



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# 6.1.3.2 Participant satisfaction with the method of testing

The satisfaction levels in the different areas asked were the following:

#### Table 9: Summary of participant satisfaction with the method used

Perceived Length: 1 not long at all, 5 extremely long.				
Synchronous	Asynchronous			
<b>2,5</b> (Ev.1: 2, Ev.2: 3)	<b>4</b> (Ev.3: 4, Ev.4: 4)			
The fact that it did not feel a long evaluation	The fact that it felt long produced a negative			
was positive	perception			
Perceived Pressure: 1 not at all pressured, 5 extremely pressured				
Synchronous	Asynchronous			
<b>4</b> (Ev.1: 4, Ev.2: 4)	1 (Ev.3: 1, Ev.4: 1)			
The fact that the participant felt pressured for answering was negative for the completeness of the answers.	The fact that they didn't feel pressured was positive			
Distraction: 1 not at all distracted, 5 extremely distracted				
Synchronous	Asynchronous			
<b>1</b> (Ev.1: 1, Ev.2: 1)	1 (Ev.3: 1, Ev.4: 1)			
The fact that the participant was not	The fact that the participant was not distracted was			
distracted was positive	positive			
Comfortable: 1 not at all comfortable, 5 extremely comfortable				
Synchronous	Asynchronous			
<b>2</b> (Ev.1: 2, Ev.2: 2)	<b>3</b> (Ev.3: 3, Ev.4: 3)			
The fact that the participant was just a bit	The comfortableness had a positive effect in this			
comfortable caused a negative effect	case			
Bored: 1 not at all bored, 5 extremely bored				
Synchronous	Asynchronous			
<b>1.5</b> (Ev.1: 2, Ev.2: 1)	<b>4</b> (Ev.3: 4, Ev.4: 4)			
The fact that the participant was only a bit	The fact that the participant was bored caused a			
bored caused a positive effect	negative effect.			
Contribution to find issues: 1 not at all contributed, 5 extremely contributed				
Synchronous	Asynchronous			
<b>3</b> (Ev.1: 3, Ev.2: 3)	<b>4</b> (Ev.3: 4, Ev.4: 4)			
Future participation in Cognitive Walkthrough: 1 not at all willing, 5 extremely willing				
Synchronous	Asynchronous			
<b>4</b> (Ev.1: 4, Ev.2: 4)	<b>2.</b> 4) <b>2,5</b> (Ev.3: 2, Ev.4: 3)			



#### **Comments:**

Synchronous	Asynchronous	
Didn't feel pressure by the moderator doing	Couldn't see the motion of some actions	
something but his actual presence made the	Seeing that the document was 64 pages was	
participant think that someone was waiting	desperate in the start, it created a negative effect of	
for him to answer so he did it faster without	laziness.	
thinking a bit more in some cases. This was	There was no one that could answer any doubts	
not comfortable for the user as he felt	about the interface.	
observed.		
The motion of the actions was helpful.		
The help of the moderator was useful to		
clarify some doubts.		

We can see that there are good and bad things about both methods used that influenced the satisfaction of the participants. In the discussion this results are going to be discussed individually and in comparison to other metrics.

### 6.2 DISCUSSION ABOUT THE DIFFERENCE BETWEEN METHODS

The participants that were carrying out the remote synchronous Cognitive Walkthrough found a total of 12 usability problems, while the participants doing the asynchronous evaluation found 17 issues. In this case the interesting thing doesn't come from the total amount of problems found for each method because the number of participants is not high enough in order to confirm that the asynchronous evaluation finds more usability problems in general. The interesting part comes from analysing the uniqueness of the problems found and the severity of them. From this we can say that the asynchronous evaluation found. In addition, the participants of the asynchronous evaluation explained more the answers given. This indicated that the participants were more committed to find usability problems as they gave more explained answers and tried to find more usability problems.

When comparing the performance we can see that the participants doing the synchronous evaluation responded to all questions correctly, so they had a 100% task completion percentage. This was expected because the moderator was present to clarify any possible doubt the participant could have and the moderator was using a script in order not to miss any questions. The task completion percentage was approximately 95% for the asynchronous evaluation; the questions not answered correctly didn't come from leaving in blank the answers but from answering things that didn't have sense and that were cause of not having memorised the task or the initial instructions properly. This demonstrates that the figure of the moderator is especially important to clarify any possible doubts, to make sure that the participant knows what the instructions are and to remind the objective of the tasks in some cases. In terms of time performance, the asynchronous participants always took more time to go through all the steps of the tasks. The difference was expected to be just a bit higher because of the fact that the participant has to write the answers instead of telling them out loud, but the differences were from more than expected, meaning that the participants took more time to think about the interaction and the design. Looking at the graph in Figure 37: Asynchronous Experimental Procedure Timeline we can see that more or less the time difference in the start is much bigger than at the end. This is due to the fact that participants doing the asynchronous evaluation found more usability problems than the synchronous participants because they spent more time thinking, especially in the first tasks because they were not so bored in the start and more motivated. This motivation decreased as time passed and the number of questions answered augmented.



Some observations that were noticed during the synchronous evaluation that influenced the performance were the fact that prototyping program (Axure) was very slow in opening and closing and there was time lost between tasks. In addition, in one occasion the program blocked and had to be restarted. This cannot happen when doing asynchronous evaluation as the action and reactions are seen directly in the document, but the interactions are not so clear because they lack motion. A good thing about the synchronous evaluation is that the participant can ask for clarifications to the moderator and in this way answer to the questions with more confidence. The drawback of this is that for responding to the questions we depend on internet connection, and in the synchronous tests it was lost 4 times, this can hinder the evaluation.

When analysing the different factors that influence the satisfaction of the participants we can see that the moderator helps the participant feel that the evaluation wasn't so long. Whereas without a moderator the person feels that the evaluation is taking longer than usual. This feeling started from the start as participants stated that before even answering any question they had the perception that the test was going to be very long by having a look at the number of page of the document. The pressure perceived is none for the participants that did the asynchronous testing and very high for the ones that did the synchronous one. According to the participant's explanation, this is because although the moderator doesn't do anything special for pressuring them, the fact that someone is waiting for them to answer makes them nervous. The participants were not distracted in both tests, meaning that they respected the rules of the Cognitive Walkthrough and that the results were not compromised by external factors. Moreover, the participants doing the asynchronous evaluation felt more comfortable than the others, probably because of the 'presence' factor. Nevertheless, the comfort in the asynchronous evaluation was not very high probably due to the length of the evaluation perceived that made the participant bored. Boredom was the next factor evaluated and in this case the participants were much more bored in the asynchronous evaluation because of the repetitiveness of the task. Having at least someone you can talk with to ask questions makes this boredom disappear a little bit. Both type of participants thought they contributed to find usability problems, but the perception of the asynchronous participant was higher because he could actually go through the questions and see how much he contributed. Finally, the participants are more willing to repeat a synchronous test than an asynchronous one because of the fact that the asynchronous test felt very long and they ended up very bored; the synchronous evaluation made them pressured but that just influenced the results of the evaluation and not their actual satisfaction with the evaluation. But what we are interested in is in the factors that influence the usability problems found so we can sum up that most influential factor is the one of the participant feeling pressured to answer.



# **Chapter 7. CONCLUSIONS AND FUTURE WORK**

### 7.1 CONCLUSIONS

### 7.1.1 MODIFICATIONS TO THE INTERFACE

According to the usability problems found in the whole interface by all participants (Table 6) and the satisfaction with the authoring tool discussed in section 6.1.3.1. The changes that should be made to the interface in order of priority are the following:

1. When in edit screen, change the text fields on the cards to a white background with border so that the users recognise they can edit the name of the character.



*Figure 39: Interface Change (1)* 

2. When in edit screen, change the text fields of the title of the tables to one with a border to recognise that the title is editable.



Figure 40: Interface Change (2)



3. When in edit screen, change the text fields inside the tables to one with a border to recognise that a user can write inside the table.

Description	English text	Hebrew text
Ruthie and Avi went out to a nightclub on a Friday evening	Ruthie and Avi went out to a nightclub on a Friday evening	רותי ואבי יצאו ביום שישי למועדון
Description 🛛	English text	Hebrew text
Ruthie and Avi went out to a nightclub on a Friday evening	Ruthie and Avi went out to a nightclub on a Friday evening	רותי ואבי יצאו ביום שישי למועדון

Figure 41: Interface Change (3)

4. Change the symbol of the arrow to indent symbol and allow increase and decrease indent.





5. Change "Add Subcategory" to "Create Subcategory"



Figure 43: Interface Change (5)


6. Change "Not Finished" and "Finished" to "Locally Saved" and "Uploaded" in the Navigation Pane and distinguish them with a colour to difference them faster

List of resources All ~		List of resources A	al v
Not Finshed	Posourco dotails	Locally Saved	Resource details
Searching for a Job 19/7/2018 For israeli students that are searching for a job in Italy.	Resource name	Searching for a Job 19/7/2 For israeli students that are searching for a in Italy.	nota ljob Resource name
Finshed	Resource description	Uploaded	Resource description
The City 30/1/2018 This resource is for erasmus students that come from a small city to a big one.	For israeli students that are searching for a job in England	The City 30/1/2 This resource is for erasmus students that of from a small city to a big one.	For israeli students that are searching for a job in England
	Language 1 English		Language 1 English
	Language 2 Hebrew		- Language 2 Hebrew

Figure 44: Interface Change (6)

7. Change the name of the button "Finished" to "Upload"



Figure 45: Interface Change (7)

8. Add a "1", "2"... next to the filter to indicate the filter is active with X number of filters.



Figure 46: Interface Change (8)

9. Make the images in the cards selectable instead of only selecting them by clicking on top of the checkbox.



Figure 47: Interface Change (9)

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### 10. Change the way of selecting tables as the one of selecting cards.

#### I.2 Other Characters

	Description	English text	Hebrew text	English sent.	Hebrew sent.
•	The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	בעל המסעדה קיבל את רותי ואבי לעבודה והתנצל על חוסר הנעימות ,	Negative <b>•</b>	Negative <b>v</b>
•	The rest of the waiters protested against the racism of the shift manager	The rest of the waiters protested against the racism of the shift manager	שאר המלצרים מחו על הגזענות של מנהל/ת המשמרת ,	Positive <b>v</b>	Positive <b>v</b>
•	1.2 Other Characters	Ļ			
	Description	English text	Hebrew text	English sent.	Hebrew sent.
	The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	בעל המסעדה קיבל את רותי ואבי לעבודה והתנצל על חוסר הנעימות	Negative	Negative ▼
	The rest of the waiters protested against the racism of the shift manager	The rest of the waiters protested against the racism of the shift manager	שאר המלצרים מחו על הגזענות של מנהל/ת המשמרת	Positive	Positive <b>v</b>

Figure 48: Interface Change (10)

11. Change the Title of the sentiment column to "Sentiment for English Text" for a better understanding.



Figure 49: Interface Change (11)

12. Change the name of "Delete" in the general command bar to "Delete Resource" as 2 delete buttons in the same page can be confusing.



Figure 50: Interface Change (12)

13. Keep the Confirmation and Warning messaged for 3 more seconds in order to give time for the user to read them.



14. Change the position and add text to the '+' button.



Figure 51: Interface Change (14)

15. Add \* near required fields

Resource details	Resource details
Resource name	Resource name *
Resource description	Resource description *
Language 1	Language 1 *
Language 2	Language 2 *

Figure 52: Interface Change (15)

16. When the side menu closes indicate the title of the resource the user is working on.

	Overview	v Text	Backgrounds	Characters	Objects	Emojis	
	+ Add B	ackground	Delete	Select All	Download	🏹 Filter 🗸	
			Į				
The C	ity:	Overview	Dialogues	Backgrounds	Character	s Objects	Emojis
+ Add Bad	kground	Delete	Select All	$\downarrow$ Download <b>V</b>	🗸 Filter 🗸		

Figure 53: Interface Change (16)



### 17. Add a confirmation message when elements have been deleted.



Figure 54: Interface Change (17)

18. Add an \* where there are empty fields that need to be eliminated of filled.

Characters	Objects	Emojis	Characters *	Objects	Emojis

Figure 55: Interface Change (18)

19. Change the Pivot name "Text" to "Dialogue" so that the name is more close to the function.



Figure 56: Interface Change (19)

20. Put a border to the filter dropdown for better visibility.

Filter 🔨	$\nabla$ Filter $\wedge$
<ul> <li>English Positive</li> <li>English Negative</li> <li>Neutral</li> <li>Hebrew Positive</li> <li>Hebrew Negative</li> <li>Selected</li> </ul>	<ul> <li>English Positive</li> <li>English Negative</li> <li>Neutral</li> <li>Hebrew Positive</li> <li>Hebrew Negative</li> <li>Selected</li> </ul>

Figure 57: Interface Change (20)

21. Add a button that allows the user to download a full resource and another one to upload it into the local application.

	Communics Authoring Tool			
Download Resource		Q		
	H New Resource	⚠ Add Resource		
	List of resources	All $\checkmark$		

Figure 58: Interface Change (21)

# 7.1.2 SUMMARY OF DIFFERENCES

For summarising the differences between methods the problem statement questions will be answered:

1. What kind of difference is there in the number and type of usability problems found between synchronous and asynchronous remote testing when using Cognitive Walkthrough as evaluation method?

According to the number of participants used for comparing both evaluation methods we cannot guarantee that the asynchronous evaluation finds more usability problems, but we can say that in general the unique problems found by this method were more difficult to detect and more important than the unique ones found by the other method. In addition, we found out that this fact was influenced by the unlimited time with no pressure the participant had to answer the questions, as the participant took more time to deeply analyse each action.

2. How does synchronous and asynchronous remote testing vary when using Cognitive Walkthrough with regards to task performance (time spent on tasks and task completion rate)?

As regards to performance, the synchronous evaluation allows the evaluation to be carried out faster, because of the natural interaction when talking, and with no incorrect answers, because of the presence of the moderator. The asynchronous evaluation lasts a bit longer but it obtains better results due to this fact. The possibility of finding more usability problems if all answers of the asynchronous evaluation were answered correctly exists, so it would be a good idea to do something to avoid incorrect answers.

3. How does synchronous and asynchronous remote testing vary when using Cognitive Walkthrough depending on participants' satisfaction level?

On the one hand, in terms of boredom, perceived length and willingness to repeat the test, the synchronous evaluation method makes the participant more satisfied. But in terms of pressure and comfort the method does not give positive results as it influences the usability problems found negatively. On the other hand, comfort and pressure perceived play a positive role in the asynchronous evaluation as it allow the participant to have full concentration. However, one has to be careful with the factors of perceived length and boredom as it can make lazy participants miss some important usability problems.

# 7.1.3 RECOMMENDATION

Out of all the lessons learnt from carrying out this research, it can be concluded that the best way for doing a remote Cognitive Walkthrough would be to get for the base the technique of the asynchronous remote Cognitive Walkthrough and to add to it the possibility of immediately calling a moderator to solve doubts in case of necessity. Furthermore, for controlling the perceived length of the test, the document shouldn't be a word document, but a web page that allows you to see only one page/step at a time, without knowing the total physical length of the test. Moreover, the use of videos instead of screenshots could be a good idea to entertain more the participant and to let him see the interaction of the design better. Finally, a virtual agent could also help for explaining in the start the general context of the program and the type of user of it. In this way, if the participant decides not to read the instructions, he has heard them at least.

# 7.2 FUTURE WORK

In the near future, the design suggestions found for improving Communics' Authoring Tool have to be taken into account for updating the document given to the developer of the program. Once the program is developed, a follow up of how the users interact with the program should be done. Then, according to how the users respond to the program more changes should be done to the interface. If the users are not happy with the program, a think aloud test could be done in order to find out the problems they encounter. If the



users are happy with the interface, new versions of the program containing new functionalities should be developed.

Some possible new functionalities can be the ones suggested by the participants after the Cognitive Walkthrough in the open questions. The most interesting were: to add a tool for users to create their own characters, objects and emoji (like a paint), to have the possibility of automatically translate the dialogues and then edit them to correct them, to allow online collaboration with other users and to receive automatic suggestions for the resources to upload depending on the title of the resource and some keywords.

For corroborating the research proposed it is suggested to repeat the exact same research with more participants, but the research do is strong enough to claim that the recommendation of using the asynchronous evaluation as a base is a success. So, in reality, the next step for this research to continue would be to see what is the effect that the recommendations detailed in the conclusion of this report cause.



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# **APPENDIX A – CONSENT FORM FOR SYNCHRONOUS EVALUATION**

	Group PP nr.
Consent form	5 ×
UNIVERSITÀ DEGLI STUDI DI TRENTO	
The University of Trento and the Fondazione Bruno Kessler support the practice of protecting research participants' rights. Accordingly, this project was reviewed and approved ethically. The information in this consent form is provided so that you can decide whether you wish to participate in our study. It is important that you understand that your participation is considered voluntary. This means that even if you agree to participate you are free to withdraw from the experiment at any time, without penalty. The aim of the session is to carry out a Usability Evaluation of Comm Walkthrough. An Authoring Tool is software interface that helps n own content to a multimedia application or system. In addition, y questions regarding the interface and to complete two surveys. The study will be divided into 4 parts: Part A: Participant Survey (Done); Part B: Cognitive Walkthrough with 5 tasks; Part C: Open questions; Part D: Survey about the Cognitive Walkthrough. Please, during the session, put your phone in silent mode so that th look at any other file of your computer apart from the Skype screen. be voice recorded and video screen recorded. For assuring your and from the moment the session starts being recorded. Only the main researcher and her advisors will have access to ident stored for at most five years (until September 2023). Non-identifiabl researchers in an anonymized dataset. This experiment poses no kno questions not addressed by this consent form, please do not hesita <b>Declaration of consent</b> (please tick each checkbox if you consent by i 1. I agree to participate in this study 2. I have read the instructions above and understand that my pa I am free to withdraw at any time, without giving any reason. 3. I understand that my identifiable data is recorded for researc and can be stored until September 2023. 4. I agree for my non-identifiable data to be made available to c anonymized dataset. 5. I agree for my anonymized data to be used in the Researcher' 6. I agree for the researcher to use anonymised video	Contact information Amaya Manzano Ibarra Human Computer Interaction student amaya.manzanoibarra@studenti.unit hon-programmer users to upload their you will be asked to answer a series of only part B and part C of the test will onymity you will be called <i>Evaluator X</i> tifiable data. This data will be carefully le data can be made available to other own risks to your health. If you have any ate to ask. inserting the balls into the circle) •••••••••• articipation is voluntary and that th purposes as described above, other researchers in an 's Master Thesis. o data of me collected during the
	×X/09/2018
Name and signature participant          Amaya Manzano Ibarra         Name and signature researcher	Date XX/09/2018 Date



# **APPENDIX B – CONSENT FORM FOR ASYNCHRONOUS EVALUATION**

	Group PP nr.
Consent form	
UNIVERSITÀ DEGLI STUDI DI TRENTO	
The University of Trento and the Fondazione Bruno Kessler support the practice of protecting research participant's rights. Accordingly, this project was reviewed and approved ethically. The information in this consent form is provided so that you can decide whether you wish to participate in our study. It is important that you	<b>Contact information</b> Amaya Manzano Ibarra Human Computer Interaction student
understand that your participation is considered voluntary. This means that even if you agree to participate you are free to withdraw from the experiment at any time, without penalty.	amaya.manzanoibarra@studenti.unitn.it
The aim of this study is to carry out a Usability Evaluation of Communi- Walkthrough. An Authoring Tool is software interface that helps no own content to a multimedia application or system. In addition, yo questions regarding the interface and to complete two surveys.	cs' Authoring Tool doing a Cognitive n-programmer users to upload their u will be asked to answer a series of
The study will be divided into 4 parts:	
Part A: Participant Survey (Done); Part B: Cognitive Walkthrough with 5 tasks; Part C: Open questions; Part D: Survey about the Cognitive Walkthrough.	
Please, while you are answering the questions put your phone ir distractions and try not to look at any other file or message of your cor you will be named as <i>Evaluator X</i> in all the documents and presentations and presentations.	n silent mode so that there are no mputer. For assuring your anonymity tions apart from this consent form.
Only the main researcher and her advisors will have access to identifi stored for at most five years (until September 2023). Non-identifiable researchers in an anonymized dataset. This experiment poses no know questions not addressed by this consent form, please do not hesitate	iable data. This data will be carefully data can be made available to other m risks to your health. If you have any e to send an email to the researcher.
Declaration of consent (please tick each checkbox if you consent by ins	serting the balls into the circle)
<ul> <li>1. I agree to participate in this study</li> <li>2. I have read the instructions above and understand that my part I am free to withdraw at any time, without giving any reason.</li> <li>3. I understand that my identifiable data is recorded for research and can be stored until September 2023.</li> <li>4. I agree for my non-identifiable data to be made available to oth many independent.</li> </ul>	•••••••• ticipation is voluntary and that purposes as described above, ner researchers in an
<ul> <li>anonymized dataset.</li> <li>5. I agree for my anonymized data to be used in the Researcher's</li> </ul>	Master Thesis.
Name and signature participant	XX/09/2018 Date
Amaya Manzano Ibarra	XX/09/2018 Date



# **APPENDIX C – PARTICIPANT SURVEY**

Part A - Participant Survey
Please answer the questions bellow *Required
Name and Surname *
Your answer
Gender *
O Female
🔿 Male
Country of Origin *
Your answer
Job Title *
Your answer
Years of experience with usability *
Your answer
Number of proyects involving usability per year *
Your answer
Have you had experience with Cognitive Walkthroughs before? *
⊖ Yes
○ No
SUBMIT



# **APPENDIX D – SCRIPT FOR SYNCHRONOUS EVALUATION**

## Informal Chat

Hello, my name is Amaya Manzano. Thank you for the time you are going to spend to do this session.Do you have any questions about the consent form you signed?[Show first screen of interface]Can you see my screen properly?How are you? Are you ready to start? Just as a reminder, we will be talking for about 1h and 30 minutes.

### **Instructions of Walkthrough**

### https://www.youtube.com/watch?v=Edqjao4mmxM

I just send you a video through Skype chat in order to refresh the memory of how to do a Cognitive Walkthrough, could you watch it?

For our particular inspection, the screen that you are going to see is going to be divided in [show screen]: left the prototype in which you can see the actions and reactions and right, the 4 questions you have to answer after a reaction. Take your time to think and to answer as much as you need. You only need to explain the answers that are a no. You don't need to read the question out loud, you can just reply the answer directly. Do you have any questions? Do you want to do a practice question?

### **Background Information**

Part B of the session starts now and I will start recording until the end of part C. If you have any questions you can interrupt me whenever you want.

The type of interface you are about to evaluate is an Authoring Tool. This is a software interface that helps non-programmer users to upload their own content to a multimedia application or system, in this case into Communics.

Communics is a desktop application designed to allow the creation of a collaborative storytelling in a multicultural setting. With the use of Communics, two culturally-different participants that don't live in the same country can create a story in the form of a comic about a topic of the conflict selected by a cultural mediator or intercultural practitioner with a background in Sociology, International Studies, and/or Counselling. The illustrated story is created by taking turns when designing the vignettes with the aid of backgrounds, characters, objects, emoji and predefined language expressions. In the image I am showing you now [show image bottom] you can see a person creating those illustrated stories with another person that is located in another part of the world.

Basically, a cultural mediator or intercultural practitioner with a background in Sociology, International Studies, and/or Counsellin has to prepare a session for the 2 persons to create a story. Part of this preparation has to do with uploading to Communics the set of resources the persons will use to design the story: backgrounds, characters, objects, emoji and language expressions. So the Authoring Tool has to provide an easy to learn interface for non-programmer users to upload the resources in to Communics and to categorise each element inside a resource as positive, neutral or negative.

## **Type of User**

The type of user of this Authoring Tool is a person that is used to use the basic programs of a computer (e.g. email, internet, word...) but has no technical background on programming or data bases. From now on this user will be named Peter. Do you have any questions?

Now the Cognitive Walkthrough is going to start.



## <u>Tasks</u>

So the first task is:

Peter left a resource incomplete last week and now he wants to complete it and upload it into Communics. In order to complete it he has to delete all the characters that are classified as "neutral" and change the predefined name of the remaining characters.

[Write the time:\_\_\_] Peter searches the incomplete resource and clicks on top of it Peter clicks "Edit". Peter clicks on top of "Characters Peter clicks on top of "Filter" Peter ticks the neutral checkbox. Peter clicks on "Select all" Peter clicks on "Delete" Peter clicks on "Delete" Peter clicks on "dfdfv.png" Peter selects dfdfv.png and deletes it Peter writes the new name Peter repeats actions 9 to 11 for each element, then: Peter selects "Finished" Peter selects "Finish" [Write the time: ]

The second task is:

Peter wants to create a similar resource to "Searching for a job" resource but changing some text categorisation. He wants to change the Hierarchy of the table titles

From:	To:
1.Narration	1.Narration
The Couple	The Couple
1.2. Other Characters	Other Characters
	2.1. Restaurant Crew

Then add a new table called "2.2. Officers" with one complete row of text. The resource has to be uploaded into Communics.

[Write the time: \_\_\_] Peter clicks on top of "Searching for a Job" Peter clicks on top of "Text". Peter clicks on top of "<-" next to the table of Other Characters Peter clicks on top of "<-" next to the table of Other Characters Peter clicks on "Add Subcategory Peter clicks on the checkbox of Other Characters Peter clicks on the checkbox of Other Characters Peter clicks on "Add Subcategory" Peter clicks on the white space under the column and writes text for the corresponding column. (x3) Peter clicks on top of New Category text and writes the corresponding title. (x2) Peter clicks on top of a selection box. Peter selects "Neutral" Peter selects "Finished" Peter selects "Finished"



[Write the time:\_\_\_]

The third task is: Peter has to compare "The City V1" and "The City V2" and eliminate the one with the highest total number of neutral elements.

[Write the time:\_\_\_] Peter clicks on top of "Statistics" with The City V1 selected Peter memorises the total amount of neutral elements and clicks "The City V2". Peter clicks on top of "Statistics". Peter compares the number memorised to the number of neutral elements in this one and decides to eliminate this one, so the clicks on "Edit" Peter clicks "Delete". Peter clicks "Delete" [Write the time:\_\_]

The forth task is:

Peter has to create a new resource with:

3 text examples categorised as 1.Introductory Words and 2. Asking for directions

2 backgrounds,

Then save for continue working another day because he has run out of time today.

[Write the time: ] Peter clicks on top of "+" Peter clicks on top of the first textbox. Peter writes on all the textboxes the corresponding text". Peter clicks on top of "Text" Peter writes the title for the category and fills the table with text. Peter clicks on a selection box. Peter selects Neutral Peter clicks on "Add Category" Peter writes the title of the new category of texts. Peter wants to write another line of text in the category of Asking for directions. He clicks the Checkbox near Asking for directions. Peter clicks on top of "Add Row". Peter fills the second table with the same procedures as before (don't want you to waste your time evaluating the same actions) Peter doesn't want to write more text for now so he clicks on "Backgrounds" Peter selects "Add background" Peter finds the file where his pictures are and selects the 2 images he wants to upload. Peter clicks "Open". Peter clicks "Save" [Write the time: ] The last task is:

Peter wants to download a background from "The City" into his computer and upload it in "Searching for a Job" another day.

[Write the time:\_\_\_] Peter clicks on top of "Backgrounds" Peter selects the checkbox of the image he wants to download Peter clicks on top of "Download". Peter clicks on top of "..."



Peter clicks "Select Folder". Peter clicks "Download" [Write the time:\_\_\_]

### **Open Questions**

Part C of the session starts now. You will have to answer to some general questions.

Could you summarise what you've seen and analysed by saying two good and two bad things about the product?

Not thinking about practical terms, what would you think a system like this should do that it doesn't? In general, do you think the functioning of the system is easy to learn as regards to the similarity with the interface of other programs?

### **Post Survey**

The session is not being recorded anymore. I just sent you a link to the Skype chat, could you please fill the survey?

https://docs.google.com/forms/d/e/1FAIpQLSdvwtK\_wcXI3cgQOQzc\_GHFoKeVwHeYVramLY3H8uqpA g5p3Q/viewform?usp=sf\_link



# **APPENDIX E – DOCUMENT FOR ASYNCHRONOUS EVALUATION**

Note: The view of the screenshots is smaller in this document for printing reasons, in reality the original Word Document had smaller margins as it was only going to be used in the computer.

Evaluator number:

# Part B – Cognitive Walkthrough

### Instructions and relevant information for the Walkthrough

Please watch the following video carefully. It will refresh your memory about how to carry out the Cognitive Walkthrough. You can repeat it as many times you want.

#### https://www.youtube.com/watch?v=Edqjao4mmxM

#### Please, read the following contextual information:

The type of interface you are about to evaluate is an Authoring Tool. This is a software interface that helps non-programmer users to upload their own content to a multimedia application or system, in this case into Communics.

Communics is a desktop application designed to allow the creation of a collaborative storytelling in a multicultural setting. With the use of Communics, two culturally-different participants that don't live in the same country can create a story in the form of a comic about a topic of the conflict selected by a cultural mediator or intercultural practitioner with a background in Sociology, International Studies, and/or Counselling. The illustrated story is created by taking turns when designing the vignettes with the aid of backgrounds, characters, objects, emoji and predefined language expressions. In the image bellow you can see a person creating those illustrated stories with another person that is located in another part of the world.



Basically, a cultural mediator or intercultural practitioner with a background in Sociology, International Studies, and/or Counselling has to prepare a session for the 2 persons to create a story. Part of this preparation has to do with uploading to Communics the set of resources the persons will use to design the story: backgrounds, characters, objects, emoji and language expressions. So the Authoring Tool has to



provide an easy to learn interface for non-programmer users to upload the resources in to Communics and to categorise each element inside a resource as positive, neutral or negative.

The type of user of this Authoring Tool is a person that is used to use the basic programs of a computer (e.g. email, internet, word...) but has no technical background on programming or data bases. From now on this user will be named Peter.

#### **Evaluation Starts**

Now is the moment of evaluating the Authoring Tool described above. You will have to do it following the Cognitive Walkthrough method explained in the video you watched before.

You will have to evaluate a total of 5 tasks. The structure of the document will help you to answer the questions, just write the answers to the 4 questions bellow each individual question, you can write as much as you want. The set of questions will appear every action and response of the system.

The action of the user is shown in the screenshot of the left and indicated in red. A description of the action is also provided underneath the screenshot. The response of the system is shown in the screenshot of the right and the changes are numbered and indicated in the same image with roman numbers.

You also have to write the time at the start and at the end of every task in the section indicated in green. I recommend you to **zoom in** the document in order to see better the screenshots.

Task 1:

Peter left a resource incomplete last week and now he wants to complete it and upload it into Communics. In order to complete it he has to delete all the characters that are classified as "neutral" and change the predefined name of the remaining characters.

Write what time it is: \_\_\_\_\_



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Action 1: Peter searches the incomplete resource and clicks on top of it

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.



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Action 2: Peter clicks "Edit".

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.



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Action 3: Peter clicks on top of "Characters".

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.







Action 4: Peter clicks on top of "Filter"

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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Action 5: Peter ticks the neutral checkbox.

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.





Action 6: Peter clicks on "Select all"

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.







#### Action 7: Peter clicks on "Delete"

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.





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Action 8: Peter clicks on "Delete"

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.



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Action 9: Peter clicks on "dfdfv.png"

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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Action 10: Peter selects dfdfv.png and deletes it

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.





Action 11: Peter writes the new name

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.

4. After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.

Peter repeats actions 9 to 11 for each element, then:



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Action 12: Peter selects "Finished"

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.





### Action 13: Peter selects "Finish"

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.

Write what time it is: \_\_\_\_

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



## Task 2:

Peter wants to create a similar resource to "Searching for a job" resource but changing some text categorisation.

He wants to change the Hierarchy of the table titles

From:	To:
1.Narration	1.Narration
1.1. The Couple	1.1. The Couple
1.2. Other Characters	2. Other Characters
	2.1. Restaurant Crew

Then add a new table called "2.2. Officers" with one complete row of text. The resource has to be uploaded into Communics.

Write what time it is: \_\_\_\_\_



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Searching for a Job 11/7/2018 For israel students that are searching for a job in Italy.	Leopoge 1 Erglish
	Language 2 Historiev

Action 1: Peter clicks on top of "Searching for a Job"

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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Action 2: Peter clicks "Duplicate".

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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Overview Text Backgrounds	Characters Objects	Emojis	Finished	🛱 Save	🗍 Delete	Open Pane	á	Statistics	
Resource details									
Resource name									
(D)Searching for a Job									
Resource description									
For israeli students that are searching for a job in England									
Language 1									
English									
Language 2									
Hebrew									

	III		A robust R ros R r	alata 🖂 Oraca Da	- a
erview	Text Backgrounds Characters Object	ts Emojis	Prinsned (E) save (i) b	Herete [[2]] Open Ha	ne <u>all</u> preconc
	a 🚓 Add Category 🔢 Delete 🗹 Select All	$V$ Rec $\sim$			
1.N	larration				
	1.1.The Couple				
•	Description	English text	Hebrew text	English sent.	Hebrew sent.
0	Ruthie and Avi went out to a nightclub on a Friday evening	Ruthie and Avi went out to a nightclub on a Friday evening	רותי ואבי יצאו ביום שישי למועדון ,	Neutral	Neutral
0	Ruthle and Avi were looking for work as waiters in a restaurant	Ruthie and Avi were looking for work as waiters in a restaurant	רותי ואבי חיפשו עבודה כמלצרים במסעדה ,	Neutral	Neutral
8	Ruthie and Avi came for a job interview at the restaurant	Ruthie and Avi came for a job intensiew at the restaurant	רותי ואבי הגיעו לראיון עבודה במסעדה ,	Neutral •	Neutral
0	Ruthie and Avi argued with the shift manager	Ruthie and Avi argued with the shift manager	רותי ואבי התווכחו עם מנהל המשמרת ,	Positive •	Positive
	Ruthie and Avi came for a meeting with the	Ruthie and Avi came for a meeting with the landlord	רותי ואבי הגיעו למפגש עם בעל הדירה	Neutral •	Neutral

Action 3: Peter clicks on top of "Text".

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.


view	Text Backgrounds Characters Objec	s Emojis	Finished C Save III D	elete 💽 Oper	n Pane 🔝 Stat	isti
	🗸 🚓 Add Category 📋 Delete 🗹 Select All					
0	Ruthie and Avi came for a job interview at Ruthie and Avi came for a job interview at the restaurant		רותי ואבי הגיעו לראיון עבודה במסעדה ,	Neutral	<ul> <li>Neutral</li> </ul>	
	Ruthie and Avi argued with the shift manager	Ruthle and Avi argued with the shift manager ,	רותי ואבי התווכחו עם מנהל המשמרת ,	Positive	Positive	
	B	Ruthia and Avi came for a meating with the	בותי וארי בניעו לתפגע את בעל בדיבה			
	Rutrie and Avi came for a meeting with the landlord	landiord		Neutral	<ul> <li>Neutral</li> </ul>	
0	I.2. Other Characters	landord ,		Neutral	Neutral	
1	Ruthe and wis came for a meeting with the Lindford	landerd ,	Hebrew text	Neutral English sent.	Neutral     Hebrew sent.	
	Indiana da vacciane for a meeting kittor the fundional meeting with the fundional meeting with the fundional meeting of t	English text	י Heberer Kott בעל המסידה קבל את רותי ואבי לעבדה התכל על היסי העימות	Neutral English sent. Negative	Veutral     Hebrew sent.     Negative	

	iew Text Backgrounds Characters C	bjects Emojis	Finished (E Save ()) L	Selete 🕒 Ope	n Pane <u>all</u> i Stat	10
	id Row 🎄 Add Category 📋 Deleter 🗹 Seb	et All				
	Buthie and Avi came for a job interview the restaurant	e and Avi came for a job interview at Ruthie and Avi came for a job interview at הגיען עבודה בכסעדה (און עבודה nterview at the restaurant , the restaurant		Neutral	Neutral	
	Ruthie and Avi argued with the shift manager	Ruthie and Avi argued with the shift manager	רותי ואבי התווכחו עם מנהל המשמרת ,	Positive	<ul> <li>Positive</li> </ul>	
	Ruthie and Avi came for a meeting with	the Ruthie and Avi came for a meeting with the	רותי ואבי הגיעו למפגש עם בעל הדירה	Neutral	<ul> <li>Neutral</li> </ul>	
	landlord	landiord				
2	2. Other Characters	English text	, , , , , , , , , , , , , , , , , , ,	English sent.	Hebrew sent.	
2	C. Other Characters  Description  The restances and possigned fluthie and Ard for work and possigned for the unpleasantness	Figlish heat The restaurant owner accepted Buhle and will for work and applogized for the unpleasantness	י Helenev text בעל הספורה קיבל את התי אבי לעבודה התכבל על חוסי העיכוות	English sent. Negative	Hebrew sent.	

Action 4: Peter clicks on top of "<-" next to the table of Other Characters

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.



	inn 🚓 Add Category 📋 Delete 🗹 Selec	All V Filer V				
1	Ruthie and Avi came for a job interview at the restaurant	t Ruthle and Avi came for a job interview at the restaurant	רותי ואבי הגיעו לראיון עבודה במסעדה ,	Neutral	•	Neutral
1	Ruthie and Avi argued with the shift manager	Ruthie and Avi argued with the shift manager	רותי ואבי התווכחו עם מנהל המשמרת י	Positive	•	Positive •
-	Ruthle and Avi came for a meeting with the landlord	he Ruthie and Avi came for a meeting with the landlord	רותי ואבי הגיעו למפגש עם בעל הדירה ,	Neutral	•	Neutral
2.0	Puthie and Avi came for a meeting with the landord Other Characters escoption	Ruthie and Avi came for a meeting with the Jundlord	יותי אבי הגיע למפגש עם בעל הדירה , Hebrew text	Neutral English sent.	•	Neutral •
2.	Ruthis and Avi came for a meeting with the landord	Ruthie and Avi came for a meeting with the	רותי ואבי הגיעו למפגש עם בעל הדירה	Neutral English sent.	• H	Neutral •
2.	Rinking and Aut care for a meeting with the function     Cother Characters     workplice     The restaurant covers accepted fluths and als for work and galonggiest for the memory accepted fluths and the for work and galonggiest for the memory accepted fluths and the for work and galonggiest for the memory accepted fluths and the for work and galonggiest for the memory accepted fluths and the for work and galonggiest for the memory accepted fluths and the for work and galonggiest for the memory accepted fluths and the for work and galonggiest for the memory accepted fluths and the for work and galonggiest for the memory accepted fluths and the for work and galonggiest for the memory accepted fluths and the for work and galonggiest for the memory accepted fluths and the for work and galong galong fluths and galong galong galong fluths and galong galong fluths and galong gal	English and Air came for a meeting with the Lindford English text The restaurant owner accepted Ruthie and Air for each and apologized for the unpleasanters	רותי ואבי הגיש למפצו עם בעל הדרה איר Hetewer Heat בעל הספעדה קיכל את רותי ואבי לעבודה	Neutral English sent. Negative	• 1 Hi	ebrew sent.
2.	Rinhie and Air care for a meeting with the Individed  Other Characters  weekpite	Ruthie and Air came for a meeting with the Londord      English text      The restaurant owner accepted Ruthia and Air for work and pologized for the Longetasantees      The restaurant owner accepted Ruthia and Air for work and pologized for the Longetasantees	חתי ואני הגיעו לתפוש עם בעל הדירה איי איי הגיע הערכי הערכי איין אייני אייני והתובל על חסר העיפות אייני הארוכה פוג על הדיוניים אי מנאלי	Neutral English sent. Negative	•   Hi	veutral •

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	Ruthie and Avi came for a job intervie the restaurant		Ruthie and Avi came for a job interview at Ruthie and Avi came for a job interview at the restaurant		Neutral	Neutral	
		Ruthie and Avi argued with the shift manager	Ruthie and Avi argued with the shift manager	רותי ואבי התווכחו עם מנהל המשמרת ,	Positive	<ul> <li>Positive</li> </ul>	
-		Ruthie and Avi came for a meeting with th	e Ruthie and Avi came for a meeting with the	רותי ואבי הגיעו למפגש עם בעל הדירה	Alexand		
	0	landlord	landlord		Neutral	Neutral	
2	2.O	ther Characters	I and/ord	, , ,	English sent.	Hebrew sent.	
2	Desc The Aui	Iandiord ther Characters  i reption  restaurant owner accepted Ruthie and for work and apologized for the keasantness	Indiand	י . Helveew text	English sent.	Hebrew sent.     Negative	

Action 5: Peter ticks the Other Characters checkbox.

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.





Action 6: Peter clicks on "Add Subcategory"

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.





Action 7: Peter clicks on the checkbox of Other Characters

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.



Add Row	An Add Subcategory III Delete 🖓 Select All	V riter v				
	the restaurant	the restaurant		INEUTRA	• Neutrai	•
0	Ruthie and Avi argued with the shift manager	Ruthie and Avi argued with the shift manager	רותי ואבי התווכחו עם מנהל המשמרת ,	Positive	<ul> <li>Positive</li> </ul>	•
	Ruthie and Avi came for a meeting with the	Ruthie and Avi came for a meeting with the	רותי ואבי הגיעו למפגש עם בעל הדירה	Neutral	<ul> <li>Neutral</li> </ul>	
2.0	ther Characters	ienouro ,				
2.0	ther Characters 2.1.New Category	English text	, Hobrew test	English sent.	Hebrew sent.	
2.0	Indeed  ther Characters  2.1.New Category  Description  The restaurat owner accepted fulfile and Ari for evit and apologies for the operasitives	English text The restaurant owner accepted Ruthe and Ari for work and goolgoed for the unpressamines	י Motivew last בעל המסעדה קיבל את רותי ואבי לעבודה - התבעל על דוסר העיפות	English sent. Negative	Hebrew sent.	

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	2.	.0	ther Characters				
	0	1	2.1.New Category				
~	·		Description	English text	Hebrew text	English sent.	Hebrew sent.
			The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	בעל המסעדה קיבל את רותי ואבי לעבודה והתנצל על חוסר הנעימות ,	Negative •	Negative •
			The rest of the waiters protested against the racism of the shift manager	The rest of the waiters protested against the racism of the shift manager	שאר המלצרים מחו על הגוענות של מנהל/ת המשמרת ,	Positive •	Positive •
i	i		2.2.New Category				
÷	1		Description	English text	Hebrew text	English sent.	Hebrew sent.
						Select	Select

Action 8: Peter clicks on "Add Subcategory"

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.





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0	2.C	ther Characters				
	Β	2.1.New Category				
$\leftarrow$		Description	English text	Hebrew text	English sent.	Hebrew sent.
	0	The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	בעל המסעדה קיבל את רותי ואבי לעבודה והתנצל על חוסר הנעימות ,	Negative •	Negative •
		The rest of the waiters protested against the racism of the shift manager	The rest of the waiters protested against the racism of the shift manager	שאר המלצרים מחו על הגזענות של מנהלי,ת המשמרת ,	Positive •	Positive •
		2.2.New Category				
$\leftarrow$		Description	English text	Hebrew text	English sent.	Hebrew sent.
	0	The security guard refused to let Ruthie and Avi in the nightclub.	The security guard refused to let Ruthie and Avi in the nightclub.	המאבטח סירב להכניס את רותי ואבי למועדון ,	Select.	Select •

Action 9: Peter clicks on the white space under the column and writes text for the corresponding column. (x3)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.



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• 2	2.0	ther Characters				
		2.1 New Category				
$\leftarrow$		Description	English text	Hebrew text	English sent.	Hebrew sent.
		The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	The restaurant owner accepted Ruthie and Axi for work and apologized for the unpleasantness	בעל המסעדה קיכל את רותי ואבי לעבודה והתנצל על חוסר הנעימות ,	Negative	Negative •
	0	The rest of the waiters protested against the racism of the shift manager	The rest of the waiters protested against the racism of the shift manager	שאר המלצרים מחו על הגיענות של מנהל/ת המשמרת	Positive •	Positive •
		2.2 New Category				
$\leftarrow$		Description	English text	Hebrew text	English sent.	Hebrew sent.
		The security guard refused to let Ruthie and Avi in the nightclub.	The security guard refused to let Ruthie and Aul in the nightclub.	המאבטח סירב להכניס את רותי ואבי למועדון ,	Select	Select

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	= 2	2.0	ther Characters				
			2.1.Restaurant Crew				
	$\leftarrow$		Description	English text	Hebrew text	English sent.	Hebrew sent.
		0	The restaurant owner accepted Ruthle and Avi for work and apologized for the unpleasantness	The restaurant owner accepted Ruthle and Avi for work and apologized for the unpleasantness	בעל המסעדה קיבל את רותי ואבי לעבודה והתגעל על חוסר הגעימות ,	Negative	Negative
		0	The rest of the waiters protested against the racism of the shift manager	The rest of the waiters protested against the racism of the shift manager	שאר המלצרים מחו על המענות של מנהל/ת המשמרת ,	Positive •	Positive •
			2.2.Officers				
	$\leftarrow$		Description	English text	Hebrew text	English sent.	Hebrew sent.
		0	The security guard refused to let Ruthie and Avi in the nightclub.	The security guard refused to let Ruthie and Avi in the nightclub.	המאבטח סירב להכניס את רותי ואבי למועדון ,	Select	Select

Action 10: Peter clicks on top of New Category text and writes the corresponding title. (x2)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.



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2.	01	ther Characters				
0	1	2.1. Restaurant Crew				
-		Description	English text	Hebrew text	English sent.	Hebrew sent.
		The restaurant owner accepted Ruthle and Avi for work and apologized for the unpleasantness	The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	בעל המסעדה קיבל את רותי ואבי לעבודה והתבעל על חוסר הנעימות ,	Negative	Negative •
		The rest of the waiters protested against the racism of the shift manager	The rest of the waiters protested against the racism of the shift manager	שאר המלצרים מחו על הגזענות של מנהל/ת המעמרת ,	Positive	Positive •
		2.2. Officers				
÷		Description	English text	Hebrew text	English sent.	Hebrew sert.
	_	The security guard refused to let Ruthie and Avi in the nightclub.	The security guard refused to let Ruthie and Avi in the nightclub.	המאבטה סירב להכניס את רותי ואבי למועדון	Salars	1

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$\leftarrow$		Description	English text	Hebrew text	English sent.	Hebrew sent.
		The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	בעל המסעדה קיבל את רותי ואבי לעבודה. והתנצל על חוסר הנעימות ,	Negative •	Negative •
	0	The rest of the waiters protested against the racium of the shift manager	The rest of the waiters protested against the racism of the shift manager	שאר המלצרים מחו על הגזענות של מנהל/ת המשמרת	Positive •	Positive •
	0	2.2.Officers			Select Negative	
$\leftarrow$		Description	English text	Hebrew text	Positive	Hebrew sent.
	0	The security guard refused to let Ruthie and Avi in the nightclub.	The security guard refused to let Ruthie and Avi in the nightclub.	המאבטח סירב להכניס את רותי ואבי למועדון ,	Neutral Select	Select.

Action 11: Peter clicks on top of a selection box.

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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	2.0	Other Characters						0	2.0	ther Characters					
	0	2.1.Restaurant Crew								2.1.Restaurant Crew					
	←	Description	English text	Hebrew text	English sent.	Hebrew sent.		~		Description	English text	Hebrew text	English sent.	Hebrew sent.	
		The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	בעל המסעדה קיבל את רותי ואבי לעבודה. והתנצל על חוסר הנעימות ,	Negative	• Negative	•		0	The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	The restaurant owner accepted Ruthie and Avi for work and apologized for the unpleasantness	בעל המסעדה קיבל את רותי ואבי לעבודה והתגעל על חוסר הנעימות ,	Negative	Negative	•
	0	The rest of the waiters protested against the racism of the shift manager	The rest of the waiters protested against the racism of the shift manager	שאר המלצרים מחו על הגזענות של מנהל/ת המשמרת ,	Positive	Positive	•			The rest of the waiters protested against the racism of the shift manager	The rest of the waiters protested against the racism of the shift manager	שאר המלגרים מחו על הגזענות של מנהל/ת המשמרת ,	Positive	Positive	•
	0	2.2.Officers			Select Negative					2.2.Officers					.
	←	Description	English text	Hebrew text	Positive	Hebrew sent.		~		Description	English text	Hebrew text	English sent.	Hebrew sent.	
		The security guard refused to let Ruthie and Avi in the nightclub.	The security guard refused to let Ruthie and Axi in the nightclub.	המאבגוח סירב להכניס את רותי ואבי למועדון ,	Neutral Select	• Select	•		0	The security guard refused to let Ruthie and Avi in the rightclub.	The security guard refused to let Ruthie and Avi in the nightclub.	המאבטח סירב להכניס את רותי ואבי למועדון ,	Neutral	Neutral	•

Action 12: Peter selects "Neutral"

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



		💼 Add Category 📋 Datate 🗹 Select All				
1	. N	arration				
1		1.1.The Couple				
-		Description	English text	Hebrew text	English sent.	Hebrew sent.
	0	Ruthie and Avi went out to a rightclub on a Friday evening	Ruthie and Avi went out to a nightclub on a Friday evening	רותי ואבי יצאו ביום שישי למועדון י	Neutral	Neutral •
	0	Ruthie and Avi were looking for work as waiters in a restaurant	Ruthie and Avi were looking for work as waiters in a restaurant	רותי ואבי חיפשו עבודה כמלצרים במסעדה ,	Neutral •	Neutral 🔻
	0	Ruthie and Avi came for a job interview at the restaurant ,	Ruthie and Avi came for a job interview at the restaurant	רותי ואבי הגיעו לראין עבודה במסעדה ,	Neutral •	Neutral •
	0	Ruthie and Avi argued with the shift manager ,	Ruthie and Avi argued with the shift manager ,	רותי ואבי התווכחו עם מנהל המשמרת ,	Positive •	Positive •
	0	Ruthie and Avi came for a meeting with the landiord	Ruthie and Avi came for a meeting with the landlord	רותי ואבי הגיעו למפגש עם בעל הדירה	Neutral	Neutral •

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u 1	. N	arration							
	0	1.1.The Couple							
÷		Description	English text	Heb	rew text		English sent.	Hebrew sent.	
	0	Ruthie and Avi went out to a nightidub on a Friday evening	Ruthie and Avi Friday evening	Finished with resource? If you click finish, you won't be able to n this resource again. Do you want finish?		רותי ואבי יצאו ביום שישי למו ,	Neutral •	Neutral	•
	0	Ruthie and Avi were looking for work as waiters in a restaurant	Ruthie and Avi waiters in a res	Finish Car	val	רותי ואבי חיפשו עבודה כמלצ ,	Neutral •	Neutral	·
	0	Ruthie and Avi came for a job interview at the restaurant ,	Ruthie and Avi the restaurant	came for a job interview at	מסעדה	רותי ואבי הגיעו לראיון עבודה ו ,	Neutral •	Neutral	•
	0	Ruthie and Avi argued with the shift manager	Ruthie and Avi manager	argued with the shift	משמרת	רותי ואבי התווכחו עם מנהל ה	Positive •	Positive	•
		Ruthie and Avi came for a meeting with the landlord	Ruthie and Avi landlord	came for a meeting with the	ל הדירה	רותי ואבי הגיעו למפוש עם בע ,	Neutral •	Neutral	•

### Action 13: Peter selects "Finished"

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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	-	Ruthie and Asi went out to a nightclub on a Friday evening	Ruthie and Avi Friday evening If y this	nished with resource? you click finish, you won't be able to modify is resource again. Do you want finish?	רותי ואבי יצאו ביום שישי למו -	Neutral	Neutral	•	from a small city to a bog one Searching for a Job RE7/2016 for insell students that are reaching for a job in the.	For inself students that are searching for a job in Expland		
	1	Ruthie and Asi were looking for work as waiters in a restaurant	Ruthie and Avi waiters in a ret	Finish Cancel	חתי ואבי חיפשו עבודה כמלע י	Neutral	Neutral	•	[D]Searching for a Job 11/07/2018 For inself students that are earthing for a job in final and	English Language 2		
	-	Ruthie and Avi came for a job interview at the restaurant	Ruthie and Avi cam the restaurant	ne for a job interview at יעדה ,	רותי ואבי הויעו לראיון עבודה במכ י	Neutral	Neutral	•				
	1	Ruthie and Axi argued with the shift manager	Ruthie and Avi argo manager	ued with the shift . ,	רותי ואבי התווכחו עם מנהל המש	Positive	Positive	•	<b>□</b> ]> iii			
	1	Ruthie and Avi came for a meeting with the landlord	Ruthie and Avi cam landlord	ne for a meeting with the מדירה ,	רותי ואבי הויעו למפגש עם בעל ר י	Neutral	Neutral	•				

Action 14: Peter selects "Finish"

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.

4. After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.

Write what time it is: \_\_\_\_\_



# Task 3:

Peter has to compare "The City V1" and "The City V2" and eliminate the one with the highest total number of neutral elements.

Write what time it is: \_\_\_\_



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			English Longuage 2 Nalian	i <

Action 1: Peter clicks on top of "Statistics" with The City V1 selected

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.





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Action 2: Peter memorises the total amount of neutral elements and clicks "The City V2".

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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Action 3: Peter clicks on top of "Statistics".

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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Action 4: Peter compares the number memorised to the number of neutral elements in this one and decides to eliminate this one, so the clicks on "Edit"

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



Action 5: Peter clicks "Delete".

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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### Action 6: Peter clicks "Delete"

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.

Write what time it is: \_\_\_\_\_

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



## Task 4:

Peter has to create a new resource with:

- 3 text examples categorised as 1.Introductory Words and 2. Asking for directions
- 2 backgrounds,

Then save for continue working another day because he has run out of time today.

Write what time it is: \_\_\_\_



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Action 1: Peter clicks on top of "+"

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.



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Language 2		Language 2	

Action 2: Peter clicks on top of the first textbox.

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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spanish abc		Language 2
		Spanish

Resource details					
Resource name					
University					
Resource description					
Inside and Outside University Scenarios for foreign students					
Language 1					
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Language 2					
Spanish					

Action 3: Peter writes on all the textboxes the corresponding text".

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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### Action 4: Peter clicks on top of "Text"

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.



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B Hello II Gao III Hola IV Select. • Select	Hola V Select • Select.	Hello 🚺 Ciao 🗰 Hola 🚺 Select. • Select.

Action 5: Peter writes the title for the category and fills the table with text.

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.



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Action 6: Peter clicks on a selection box.

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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#### Action 7: Peter selects Neutral

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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Action 8: Peter clicks on "Add Category"

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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Action 9: Peter writes the title of the new category of texts.

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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Action 10: Peter wants to write another line of text in the category of Asking for directions. He clicks the Checkbox near Asking for directions.

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.



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Action 11: Peter clicks on top of "Add Row".

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.

4. After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.

Peter fills the second table with the same procedures as before (don't want you to waste your time evaluating the same actions)



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2. Asking for directions Description Why are you disturbing me?	Ralian text Perché mi stai disturbando?	Spanish text Por qué me estas molestando?	Italian sentiment Spanis Negative • Nega	h sentiment
2. Asking for directions Description Why are you disturbing me? Could you have me?	Ballen Seat Perché mi stai disturbando? Roka biotamu?	Spanish text Por qué me estas molestando? Pando anadoma?	Negative • Nega	It sentiment

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Action 12: Peter doesn't want to write more text for now so he clicks on "Backgrounds"

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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Action 13: Peter selects "Add background"

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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Action 14: Peter finds the file where his pictures are and selects the 2 images he wants to upload.

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.



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2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.





### Action 16: Peter clicks "Save"

(Clarification: the new resource fades in and a conformation message "Your changes have been saved" appears and then hides after 5 seconds )

1. Is the effect of the action the same as the user's goal at that point? (e.g. if the consequence of the action is to save a document, is 'save the document' what the user wants to do?)

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.

4. After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.

Write what time it is: \_\_\_\_



### Task 5:

Peter wants to download a background from "The City" into his computer and upload it in "Searching for a Job" another day.

Write what time it is: \_\_\_\_




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Action 1: Peter clicks on top of "Backgrounds"

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.

4. After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.





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Action 2: Peter selects the checkbox of the image he wants to download

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.

4. After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.





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Action 3: Peter clicks on top of "Download".

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



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Action 4: Peter clicks on top of "..."

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.





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Action 5: Peter clicks "Select Folder".

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.





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Not Firshed	O Confirmation	
Searching for a Job THT12018	Your pictures have been downloaded to: ChDesktoplAware Scenarios/UACRISROUNDS	
For locard students that are searching for a job in Italy.		
Finalwed	The same parties	
The City 30/1/2016	Trento Square Trento Trees	
This resolution is for exactnus students that come from a small city to a big one.	English sentiment Neutral English sentiment Neutral	
	Patient sectores Assess	

Action	6:	Peter	clicks	"Downlo	oad"
runn	υ.	I CICI	CHCKS	Downie	Jau

2. Will the user see that the action is available? For example, if they view in that moment the button they want to press.

3. Once the users have performed the action, will they know is the one they need? For example, they know they have to press that button and the effect it will have.

Write what time it is: \_\_\_\_

<sup>(</sup>Clarification: the message hides after 5 seconds)

<sup>4.</sup> After the action has finished, will the users understand the feedback they get? For example, if the user has saved something he expects a confirmation that the document has been saved so that they know they have completed their goal.



#### Part C - Open Questions

1. Could you summarise what you've seen and analysed by saying two good and two bad things about the product?

2. Not thinking about practical terms, what would you think a system like this should do that it doesn't?

3. In general, do you think the functioning of the system is easy to learn as regards to the similarity with the interface of other programs?

#### Part D - Survey about the Cognitive Walkthrough

Please fill in this online survey about Part B, the Cognitive Walkthrough:

https://docs.google.com/forms/d/e/1FAIpQLSdUurSfE4WmJCe3ymBIuPiPZIHDUPJ7WH4uW\_LXfwbWJz VEBw/viewform?usp=sf\_link

Write what time it is:

### Thank you for participating in this study!!!!



### **APPENDIX F – POST QUESTIONNAIRE ABOUT THE COGNITIVE WALKTHROUGH**

Part D (	Asyr	nchro	nou	s)		
Please answer this q	uestions as	s honest as j Cognitive W	oossible and	I take your t	ime. Answer	all the questions ir
*Deguired	ne test, the	Cognitive vi	aiktrirougri			
Required						
Your evaluato	or numb	er: *				
Your answer						
How long did	you fee	el the ins	spection	was?*		
	1	2	3	4	5	
Not long at all	$\bigcirc$	0	0	$\bigcirc$	$\bigcirc$	Extremely long
Question) *						
Neutral						
Oneguive						
How pressure	ed did y	ou feel t	o answ	er the qu	uestions	?*
	1	2	3	4	5	
Not pressure at all	$\bigcirc$	0	0	0	$\bigcirc$	Extremely pressured
Do you think t in a positive, r question) *	this influ neutral	uenced or negat	the com tive way	ipletene ? (regar	ss of yo ding the	ur answers previous
O Positive						
Neutral						
Negative						
How distracte	ed were	you dur	ing the	inspecti	on?*	
	1	2	3	4	5	
Not at all distracted	$\bigcirc$	$\bigcirc$	0	0	$\bigcirc$	Extremely distracted



Do you think t in a positive, r question) *	this infl neutral	uenced t or negat	the com ive way	pletene ? (regar	ss of yo ding the	ur answers previous
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Negative						
0						
How comfort	able dic	l you fee	el during	the ins	pection	? *
	1	2	3	4	5	<b>F</b> ( )
Not at all comfortable	$\bigcirc$	0	$\bigcirc$	$\bigcirc$	$\bigcirc$	comfortable
Do you think t in a positive, r question) *	this infl neutral	uenced t or negat	the com ive way	pletene ? (regar	ss of yo ding the	ur answers previous
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Negative						
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Not at all	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	$\bigcirc$	Extremely
Neutral						
Neutral						
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Your answer						



### **APPENDIX G – TEMPLATE FOR USABILITY PROBLEM REPORT SHEET (INDIVIDUAL)**

Evaluator Number:					
Problem Identified					
Problem Identified					

. . . . . . .



### APPENDIX H – TEMPLATE FOR USABILITY PROBLEM REPORT SHEET (2 METHODS)

Synchronous		Asynchronous	
Problem Identified	Severity	Problem Identified	Severity

•••



### APPENDIX I – TEMPLATE FOR USABILITY PROBLEM REPORT SHEET (GLOBAL)

Problem Identified	Severity

. . . . .



### APPENDIX J – INDIVIDUAL USABILITY PROBLEM REPORT SHEET COMPLETED

### Evaluator Number: 1

#### Task 1

Exact words from participant	<b>Problem Identified</b>
"It is difficult to recognise that the name of the characters can actually be edited as there is no evident text field"	Textboxes are not clear in image cards.
"When the filter opens, it has the same colour as the background so it is not very easily recognisable"	Filter dropdown is not clear.
"I don't have the difference between save and finished very clear and they are too close in the interface to be misunderstood"	Not clear meaning of Finished

Exact words from participant	Problem Identified
"The arrow near the table is quite confusing, the symbol is not the correct one for indenting"	The arrow near the text tables is not identifiable as indent symbol.
"No, the titles don't seem they can be modified"	Textboxes are not clear in table titles.
"I didn't know that you could write in the table in the start because there were no text fields, later I thought that you could try to click on top but at first it wasn't obvious"	Textboxes are not clear in tables.
"It was a bit difficult in the start to realise that the sent. abbreviation meant sentiment when the table gets a bit smaller, I didn't know what it was referring to"	The title of the column '[Language] + "sentiment"" needs further explanation.



Task 5					
Exact words from participant	Problem Identified				
"There was no time for reading properly the location where the file was downloaded"	Confirmation message hides too fast				

### Evaluator Number: 2

Task 1

Exact words from participant	<b>Problem Identified</b>
"There is no field that indicates you can edit the name of the character"	Textboxes are not clear in image cards.
"I don't see the difference between finish and save. It is not immediate what finish means"	Not clear meaning of Finished

Exact words from participant	Problem Identified
"Not really sure what text means. Like I don't know what type of resource is being uploaded into Communics."	The word "Text" is not recognised as a piece of text for a dialogue.
"No, because an arrow doesn't mean to indent"	The arrow near the text tables is not identifiable as indent symbol.
"No, the selection of the table is not consistent with the selection of the characters. The table should also go black when selected"	The table selection is not consistent with the other item selections in the program.
"You are using the things you have already created, so it doesn't make sense that you add a subcategory, you are changing or creating a subcategory instead."	Word "Add" near subcategory is confusing
"It is not clear that the 'English sent.' refers to the sentiment of the text put by an English person"	The title of the column '[Language] + "sentiment"" needs further explanation.
"The table has no fields so it is difficult to know you can write in them"	Text boxes are not clear in tables.



#### Task 4

Exact words from participant	<b>Problem Identified</b>	
"The time of the saving confirmation maybe it is too quick as it happens at the same time as the resource appears in the navigation menu"	Confirmation message hides too fast	
Task 5		

Exact words from participant	<b>Problem Identified</b>
"Maybe the person doesn't find the checkbox	Checkbox in image card is maybe not visible.
and clicks on top of the image instead as many	
other programs allow this, it is more intuitive	
than selecting a checkbox"	

### **Evaluator Number: 3**

Exact words from participant	Problem Identified
"No, it can be clearer that the resource is indeed unfinished. Even though it says so in the side menu, the resource does look "finished" when opened on the right side. There is no clear signal on what information is missing or which parts should be further worked on."	Missing identification of the sections that need to be finished.
"No, it can be confusing having two "delete" buttons on the same page. It is likely that the user does not interpret the difference between the two actions but is hopeful that the correct one was pressed."	Two 'Delete' with the same symbol and everything in the same page can be confusing.
"Yes, although it is confusing that the filter does not remain active. There should be a clearer indication that filters are active/not active."	Filter button has no indication of being active or not.
"Partly, can be helpful to have a text saying that "x number of characters" were deleted to be even more clear."	Missing confirmation message when elements have been deleted.



"No, there is no specific indication that the	Textboxes are not clear in image cards.
name can be changed by pressing. This can be	
more visible with a hovering colour change or	
similar."	

#### Task 2

Exact words from participant	Problem Identified
"No, it is difficult to see the arrow and understand what it is meant for."	The arrow near the text tables is not identifiable as indent symbol.
"I can't see any "undo" or "increase indent" if the user changes his mind"	Inconsistency in creating subcategories with indent and button.
"A new line is generated beneath with no content it can be good to indicate that the fields are mandatory (if they are). If they can be kept blank like that it can be OK."	Missing indication of required empty fields.
"No, can be difficult to understand that text can be filled in."	Textboxes are not clear in tables.
"No, not obvious that text can be written/edited."	Textboxes are not clear in table titles.
"Save" can be interpreted similarly."	Not clear meaning of Finished

Exact words from participant	Problem Identified
"No, the plus can be a little more separated from the search field to indicate that it is not a part of the search but a separate action."	The "+" button is not clear that it is for a new resource
Task 5	
Exact words from participant	Problem Identified

					•	•			
"It	can	be	difficult	to	spot	the	check	box	Checkbox in image card is maybe not visible.
(es	pecial	lly iı	n the figur	e b	esides	)."			



### **Evaluator Number: 4**

#### Task 1

Exact words from participant	Problem Identified
"I would expect to see the name of the resource at all times, even when I change of tab. I could have several browser windows open, editing different resources and I would not know what resource I am working on in each window if I change to the characters tab."	When side menu is closed and you work on a pivot that is not the overview there is no possibility of knowing what resource you are working on.
"Yes, the characters are deleted, but the filter seems to have been removed too. I would expect to see no characters after deleting all characters under a certain filter."	Filter button has no indication of being active or not.

#### Task 2

Exact words from participant	Problem Identified
"No, I would not guess the meaning of the arrow."	The arrow near the text tables is not identifiable as indent symbol.
"I was expecting something to pop-up to add a new subcategory name or a list of current subcategories to select from."	Word "Add" near subcategory is confusing
"I do not understand why this new subcategory was created blank and the other one contained items in it."	Inconsistency in creating subcategories with indent and button.
"Missing to signify that the fields are editable."	Textboxes are not clear in tables.
"I would have not guessed that the texts are editable by just clicking on them."	Textboxes are not clear in table titles.
"Is 'Finish' the same as 'Publish'? The name is a bit ambiguous."	Not clear meaning of Finished

Exact words from participant	Problem Identified
"The location and symbol used of this button makes it a bit of a guessing game to know what it will do."	The "+" button is not clear that it is for a new resource



"The abbreviation of sent. is not the correct one	The title of the column '[Language] + "sentiment""
and it is difficult to imagine what is this column	needs further explanation.
for"	
"When clicking on the checkbox near the table	The table selection is not consistent with the other item
the selection of the table is not appropriate as it	selections in the program.
doesn't follow the same style as with the cards	
from the characters for example."	



### **APPENDIX K – OPEN QUESTION RESPONSES**

#### Evaluator 1

## 1. Could you summarise what you've seen and analysed by saying two good and two bad things about the product?

The good thing is that you can always get feedback which is very important for the user to know how is doing the correct thing. The other thing is that the user already knows what he is able and not able to do with the blocking of some options. The things that I didn't like as much were some of the words used such as add or finished... and also the way of hanging the names of the characters was confusing.

## 2. Not thinking about practical terms, what would you think a system like this should do that it doesn't?

It could be interesting to have some tools for creating own characters or directly upload images from the internet.

# 3. In general, do you think the functioning of the system is easy to learn as regards to the similarity with the interface of other programs?

I think that the program uses some similarities to other very well-known programs, which makes it easier for users to get used to the program very fast.

#### **Evaluator 2:**

### 1. Could you summarise what you've seen and analysed by saying two good and two bad things about the product?

It is positive that the information hierarchy of the system is quite clear and that there is always a good feedback of the system.

The negative parts are that some buttons don't have a clear naming and that some confirmation messages don't stay enough time.

## 2. Not thinking about practical terms, what would you think a system like this should do that it doesn't?

Allow more space for notes rather than just having a general description.

## 3. In general, do you think the functioning of the system is easy to learn as regards to the similarity with the interface of other programs?

Yes, I think that the interface is designed so that it reminds the user of how to use it by similarity with other programs, so it will be easy to learn for first users.

#### Evaluator 3:

## 1. Could you summarise what you've seen and analysed by saying two good and two bad things about the product?

+ Well-structured product + Good feedback

- Many actions/elements, therefore risk for confusion (e.g. Save vs. Finished), and why can't something finished be edited later? - Still not completely sure about the language part (why positive, negative and neutral can be selected says very little to me), and that neutral changes both language selections?

# 2. Not thinking about practical terms, what would you think a system like this should do that it doesn't?

Maybe the possibility to draw own elements and add them to the story. And automatic translation of the description into corresponding languages with possibility of the user to change/correct text.

# 3. In general, do you think the functioning of the system is easy to learn as regards to the similarity with the interface of other programs?

Yes, I think the interface has very good consistency between pages, and also compared to other applications. Most of the symbols are easy to understand. The indent symbol (<-) can be further clarified by using a "decrease indent" symbol.

#### **Evaluator 4:**

# 1. Could you summarise what you've seen and analysed by saying two good and two bad things about the product?

The good:

- 1. Familiar interface.
- 2. Buttons with text labels.

The bad:

- 1. Working with the text is a bit complicated, I think it can be improved.
- 2. Many steps.

# 2. Not thinking about practical terms, what would you think a system like this should do that it doesn't?

A Ctrl Z option and the possibility of sharing the resources with another person.

# 3. In general, do you think the functioning of the system is easy to learn as regards to the similarity with the interface of other programs?

I think that after going through a couple of runs the user would be familiarised with the product.