



Graduation report
Serge Mes
4093607
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Integrated Product Design
Delft University of Technology

Bubo

A serious game to
help students in
finding a suitable
internship

Graduation report by Serge Mes
December 2017, Faculty of Industrial Design Engineering at Delft University of Technology

Serge Mes
sf_mes@hotmail.com
0648518363

Delft University of Technology
Faculty of Industrial Design Engineering
Landbergstraat 15
2628 CE Delft
The Netherlands
info@tudelft.nl
www.io.tudelft.nl

Yubu B.V.
Schiekade 105
3033 BH Rotterdam
The Netherlands
info@yubu.co
<https://www.yubu.co/>

Mentor: Prof. dr. H.M.J.J. Snelders
Management and Organisation
h.m.j.j.snelders@tudelft.nl

Chair: Dr. V.T. Visch
Design Aesthetics
V.T.Visch@tudelft.nl

Company mentor: G. Meijer
Co-founder of Yubu B.V.
guus@yubu.co

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Abstract

Yubu B.V., for whom the graduation project is carried out, provides a career orientation method (called Yubu) for high schools that uses serious games to motivate students to focus on choosing a study. Making decisions concerning a career is not something that stops after high school and therefore Yubu B.V. has taken interest in offering a career counselling program for students.

Research is carried out to find out how Yubu B.V. can be of service to students. Annual reports from governmental institutions revealed that HBO education (University of Applied Sciences) struggles the most with delayed students and student satisfaction for career orientation programs. Therefore, the decision was made to focus on HBO education. The outcome of the interviews with the target group revealed that an internship is considered an important moment in their career preparation

because it provides a period in which students learn if a type of work suits them. Unfortunately, students struggle with finding a suitable internship because they are not certain about their abilities and interests and end up at the wrong company due to the lack of sufficient career orientation programs. Another problem is that it is very difficult to get an invitation for an internship interview resulting in a study delay for many students.

A serious game is designed that helps students to get an invitation for an internship interview that fits with their interests and values so that they have a bigger chance to get selected and enjoy the time they work for a company. The game is played in three steps. Students will do a self-reflection of which the results can be used to search for an internship and after they have found one they try to get an interview invitation from the company.

Students indicated to have an aversion for self-reflecting in general. However, a better self-image helps students in defining their ideal internship. To ensure that students will perform a self-reflection a model is designed for this specific purpose. This model helps students in defining their internship preferences, skills, motives and personal mission. For each of the categories students create playing cards. All of them together form a card deck that generates a character, which is a representation of themselves and is further used as their avatar in the game. Companies use the same model to create a vacancy so that it can be matched with the characters. With a mini-card game students filter through the offers by laying down cards and making combinations. Students can look at the results and can decide to apply for one or more. They will be placed in a queue together with other students who applied. Students can now compete with each other to earn a

position at the front by strengthening their card deck (doing more reflecting). At some point the enrolment deadline expires and the few students at the top get the invitation.

Parts of the game are tested separately with the target group with positive responses as result. However, a large scale test needs to be carried out to find out how efficient the system is, by making real matches between students and offers. Furthermore, for the success of the game it is important that schools are involved because they can play an important role in setting up the game. Schools have databases of companies who need interns and can advise students to use the game.

1. Introduction

1.1 Terminology

Throughout the report some terminology is used that is only known in the Netherlands because they are related to the Dutch school systems. The product discussed in this report is aimed for the Dutch market and therefore the Dutch terminology is used. An explanation for each one is provided below.

Loopbaan orientatie begeleiding (LOB) = career orientation counselling

Middelbaar beroepsonderwijs (MBO) = similar to vocational education

Hoger beroepsonderwijs (HBO) = University of Applied Sciences

Wetenschappelijk onderwijs (WO) = Research Universities

Bindend studieadvies (BSA) = a notice of an institution a student is given that indicates he or she can continue the study at the same institution or should quit.

Propodeuse (P) = a certificate that is given to students who have completed all the courses in the first year of their study.

Studieloopbaan begeleiding (SLB) = study career counselling for University of Applied sciences

1.2 Project description

My graduation project is about the use of serious gaming in a career orientation program for students. Serious gaming is a way of learning (and possible behaviour change) through play and therefore part of personal development. At some point in my career I hope to find work as a serious game developer because personal development is a driving force of life for many people (including myself) and I considered it as my goal to contribute with this rather new appliance of gaming.

Career orientation programs

Around 30% of the students graduated from high school will stop within the first year of their study (ResearchNed, 2015). This is both a concern for schools and government because they want to avoid spending effort and finance to wrong choices made by students. Many career orientation programs or in Dutch 'Loopbaanorientatie begeleiding (LOB)' are developed for schools to help students making career and study decisions and therefore reduce the dropout.

Company background

Yubu B.V. (for whom the graduation project will be carried out) provides an LOB-method (called Yubu) that uses a different approach in comparison to its competitors (who use mainly questionnaires to give career advice). In Yubu students will learn more about who they are and what they want by doing assignments. These assignments are chosen by the students themselves depending on their needs (Yubu B.V. offers a custom program). They often contain game

elements to motivate the students to focus on their career perspective and varies from complete board games to online assignments. Finally, Yubu creates a portfolio that gives a better understanding of their skill-set and interests and therefore help them with decisions related to career planning (choosing a study program and/or follow-up study).

Development of a new product

Yubu B.V. current product is targeted at high schools. But,

DESIGN GOAL:

The design goal is to develop a product (service system

That students use to prepare themselves for their professional career.

making decisions concerning a career is not something that stops after high school. During a study students have to make decisions concerning an internship, graduation project and eventually a job within a specific sector. Yubu B.V. has taken interest in offering a career counselling program for students. It will extend their current target group and therefore offers potential growth for the company.

Problem definition

The difficulty in helping young students to come to a fitting career choice is the fact that young people think short-term because they are more concerned with their direct surrounding on the emotional/social side rather than rational thinking for the future. This

applies until the age of 25 (Crone, 2010) and in this period they have to prepare themselves for employment. Even though choosing a study narrows down the spectrum of jobs you can apply for, the amount of functions is large and this makes the decision not easier. Therefore, you would expect career orientation programs for follow-up studies as well. However, there are not many.

The next step for Yubu B.V. is to extend their target group to students. The current product, however, is focused primarily on high schools and is very content driven with many specific assignments. This is possible because the education given on secondary schools is basically the same in the whole country. Unfortunately, there is a

large variety in further educations. Due to the many sectors (health, business, technique, etc.). The current product is not suitable because too much content must be created to cover everything.

Assignment

A new product will be designed that prepares students for their professional career. It will be designed using a different approach that is largely applicable. With the product students will learn more about themselves (who they are and what they want in relation to career opportunities). In order to do so, it will make use of persuasive game design to both motivate students and stimulate active learning.

The current product of Yubu B.V. creates meaningful experiences by doing assignments. However, meaningful experiences are gained constantly in and out school surroundings. If students are able to capture them and reflect on them, there will be no need to create content driven assignments. As part of the design process the possibility of using this approach and implementation will be examined.

1.3 Method

Using the element of play as an appliance for learning and behaviour change is a rather new concept and is called serious gaming. But, what is exactly a serious game? And how do you design one? Many definitions appeared over the past few years, but this cannot be said about methods that are developed to design them. Fortunately, The Persuasive Design Group established at the faculty of Industrial Design Engineering has developed models over the past few years that teaches you some of the basics in designing serious games.

Persuasive game design model

The aim of a serious game is to change the behaviour of the player using elements of play in a secure environment usually accompanied with a set of rules. However, behaviour change is only accomplished effectively if it also occurs in the real world after playing. This forms the basic idea of the persuasive game design model as showed in figure 1 (Visch et al., 2013).

Game designers have the ability to turn aspects of the real world into a game

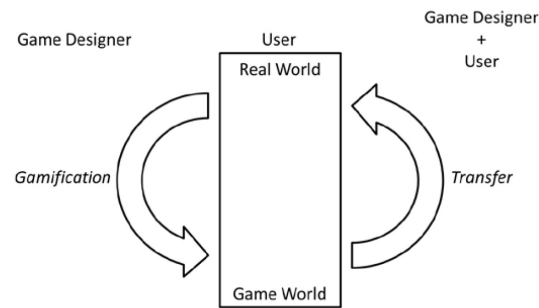


Fig. 1 Persuasive game design model

world using game mechanics (left arrow of the model). This is called gamification and is used quite often to make certain aspects of the real world more fun. However, this will not change the behaviour of the player outside the game world and to do that, a certain transfer effect will have to take place (right arrow).

With the transfer effect is meant that the user experience in the game changed, reinforced or formed the attitude of the person outside the game environment.

Creating a serious game

As mentioned in the graduation assignment Yubu B.V. will deal with young adults that have a certain attitude which makes it difficult for them to prepare for their professional career. Behaviour change might be a solution to some of the problems and therefore the decision was made to use this model and to create a serious game.

A method describing the essentials for serious game design is developed and published by the TUDelft (Siriaraya et al, 2014). These essentials are presented as a list of ingredients and are used throughout this project as guidelines.

The design framework explains that the design of a serious game can be split into four main parts. The order in which they will be discussed is also the same way as they will occur in the report.

Defining the transfer effect

The designer will determine what will be the goal of the serious game and what the result will be when the users finishes the game (behaviour change).

In order to do so the user group is investigated and the scope of the project is determined. This is done by reading reports and doing interviews with the user group.

Investigating the user's world

For the next step the designer has to find solutions to achieve the transfer effect. This is done through an iterative process where ideas, methods and concepts are designed, presented and tested with the user group on a regular basis.

Game design

The focus in the third section is the design of all the elements that will make it a complete game. Game mechanics are developed, the theme of the game is determined and all the interactions that will take place are designed.

In order to design these above-mentioned aspect it is useful to look at current methods for designing entertainment games because those are available and much can be learned from them. Especially since game design is rather new process for an industrial designer. The book "The art

of game design: a book of lenses" by Jesse Schell is a widely acclaimed guide in game design and therefore consulted many times (Schnell, 2008).

Evaluation of effects

The last step is the evaluation of the game with the end users. This is done paper prototypes.

2. Career orientation for follow-up studies

2.1 Assisting HBO students

Before the start of the project, you as a designer are groping in the darkness. At the beginning you have certain questions and by trying to answer them you first stumble upon new questions. An analysis phase will give grip on this blurry situation so that you will become more acquainted with the subject. It will also help defining the scope of the project so that later on it is easier to find solutions. It usually starts with collecting quantitative information from journals, annual reports and reading articles on the internet. For this project the analysis phase was focused on gaining knowledge about the different education levels in order to find out if the product should cover them all or if it is better to focus on one education level and if so, which one?

The results showed that HBO education (University of Applied Sciences) struggles the most with delayed students and student satisfaction for career orientation programs. This turned out to be a promising opportunity for Yubu B.V. to make its entrance.

2.1.1 Project scope

In this paragraph the scope of the project is determined. Based on the annual reports published by several education associations and governmental institutions the decision was made to continue with HBO education for reasons that will be discussed on the following pages.

Educational level

Covering all students for this project would be a very ambitious task. The age group is very broad and ranges from 16 until 25 years old if you include all education levels. A person of 16 years old may still be a child while a person of 25 is already an adult for some years. In addition, a student from vocational education has to make career decisions at a much younger age (16-20) than students from Universities (18-25). Although the goal might be the

same for each group (finding a job), the approach to help them and to motivate them should be different. Therefore, it is better to choose for one education level.

Many job options

Most vocational studies are very practical and prepare you for a specific job while graduates from HBO and WO education have more options available in comparison. This will make career decisions more difficult for students that have followed a higher education level.

Large student delay

After the fourth academic year only 35% of the students graduated (fig.2). 42% is still busy and 23% dropped out of the study ("Studiesucces in het hoger beroepsonderwijs", 2017). The biggest reason to quit is the lack of motivation which accounts for 50% of the students (who came directly from high school) (ROA-R, 2016). This might be due to the difficulty in making career decisions and the fact that they are still very young. Students without a career goal

might lose motivation (they do not know why they are studying) and

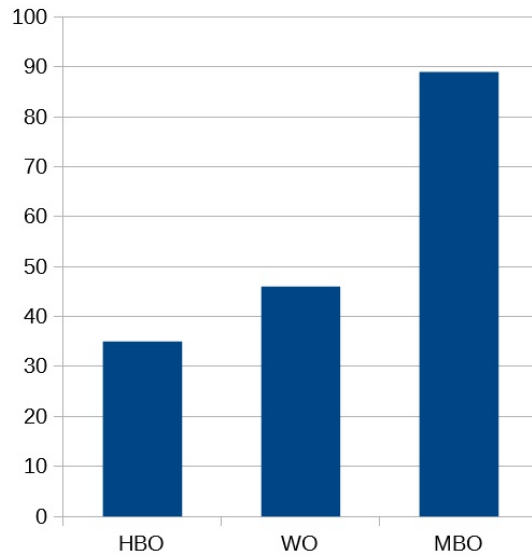


Fig. 2 Percentages of students with a degree without delay for each education level.

start to postpone their graduation.

Unsatisfied with counseling

68% of the HBO students is unsatisfied with the career counseling for employment (ROA-R, 2016). This indicates that there is much room for improvement. It is interesting to know why this is the case. Interviews with students revealed that there is little attention

for students to prepare them for employment and it is considered dull and very passive. More information about this topic will follow later on in the report.

Lack of LOB-methods

There are many LOB-methods found after a short search on the internet (fig. 3). However, many are targeted at high schools or vocational education. HBO education has career counseling programs, but those are created by

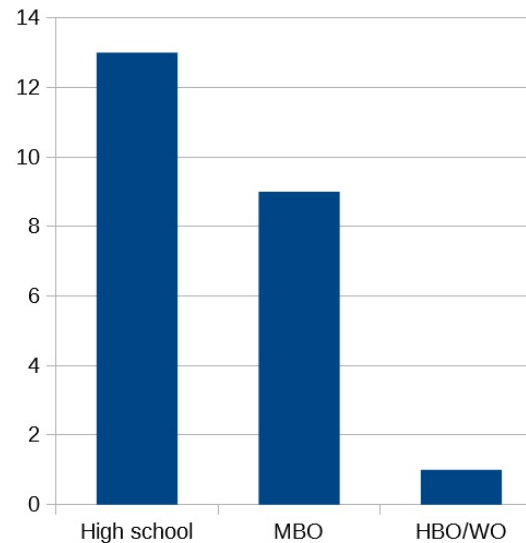


Fig. 3 Available methods for the different educational levels after a quick internet search.

the schools themselves. This means that there is a market potential for Yubu to focus on University education.

Conclusion

Based on the annual reports it became clear that HBO education is performing less, but the reports contain little information on why this is the case. More research is therefore required to find out what problems occur in order to solve it with a serious game.

2.2 Finding the right internship

AT this stage it is determined what the scope is where the product will operate, namely HBO education. Within this scope you have to familiarize yourself with the problems that occur and choose which problems the product should solve.

Interviews have been conducted with the target group and the results are presented in an info graphic showing their study journey.

The outcome of the interviews revealed that students find it difficult to make career oriented decisions. A very early one is the decision for an internship. Internships provide a period in which a student learns if a type of work suits them. However, it is a process of trial and error because students are not certain about their abilities, interests and goals and end up at the wrong place (company). Another part of the problem is the lack of sufficient career orientation programs provided by schools and that it is very difficult to get an invitation for an internship interview.

2.2.1 Interviews

Numbers say something about a situation, but little about underlying problems. To get a better understanding of all the problems that occur in a certain context users should be researched in order to obtain qualitative information. Interviews were conducted to gather insights in the lives of students and the problems they encounter. The results are presented in an infographic (fig. 5) that shows a journey map of a typical student at the start of his or her study until graduation.

Method

To create a journey map interviews were conducted with individual students. This decision was made for a number of reasons:

- The journey for each student is different based on decisions they make throughout their study. Therefore, they will all tell a different story.
- It is more valuable to obtain qualitative data because Information will be obtained in the form of stories that contain many

experiences and insights that would not come to the surface if only a survey would be filled in by the participants.

- It is better to have individual contact because the participants will speak about their personal stories. They will stay anonymous and therefore can speak freely about their opinions or maybe mistakes.
- Lastly, it was easier to make appointments.

Participants

Figure 4 shows the study trajectory of HBO students. To sketch a complete

image of their journey, interviews were conducted with students from each

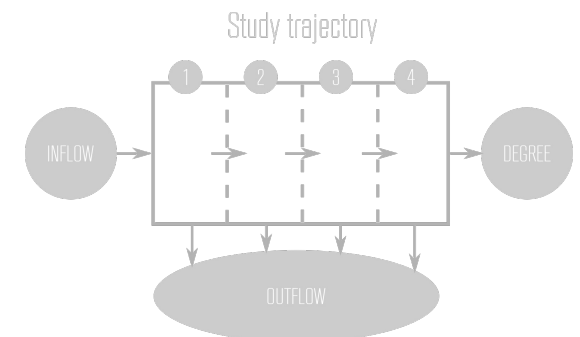


Fig. 4 study trajectory

study year and students that finished a study with a degree. In addition, students from both technical studies and non-technical studies were interviewed because they may differ when it comes to needs in preparation for employment.

A total of 14 students were interviewed at the De Haagse Hogeschool in Delft and Hogeschool Rotterdam with at least two from each academic year. Circa half were woman and the interviews took around 40 minutes.

Research question

After the findings from the previous chapter the following research questions were formulated:

- How do students prepare themselves for employment?
- Are they satisfied with the counseling offered by the school and what is missing?
- What is the right moment to orient on employment?
- How do people look back at important decisions they made concerning their career during or after their study?
- How do they came to their decisions

and what tools/methods are used?

Results

Generally speaking students are focused on short-term goals in their first year. That is achieving a BSA and a propodeuse in their first year. School counseling emphasizes this and not much attention is given to future plans.

In the start of the second year problems occur for some students. They come to the conclusion that they do not know what they want to do next or where they are doing it for. Some will do other activities while others will continue, but results sometimes drop.

Not many students will consult study counselors. One of the reasons is that little time is available to give personal attention. Another reason is that the focus is primarily on study progress. They solve above-mentioned problems by themselves or with help of others. Some students had successfully asked teachers for advice, but only if there was a match in interest.

Near the end of their second year students have to find internships by themselves. Most of them said that this

is and should be part of the learning process. However, more guidance would be helpful. The school offers lectures in order to prepare for an application, but again students told that it is very superficial and there is no room for personal feedback.

Students encounter difficulties when looking for an internship. For some applies that they do not know what their capabilities are and how to present themselves to companies. Therefore, they do not know which companies they should contact or even where to start looking. Others apply for many offers but are rarely invited by the companies.

Decisions are made based on trial error. Most students do not know what they want and choose based on a first impression. If they think of something interesting they will try it, but if it turns out they did not like it, they will try something else. Self-reflection can help in this case. However students do not like tests or writing reflection reports.

All students told that they learn the most during their internships about their skills set and the topics they find

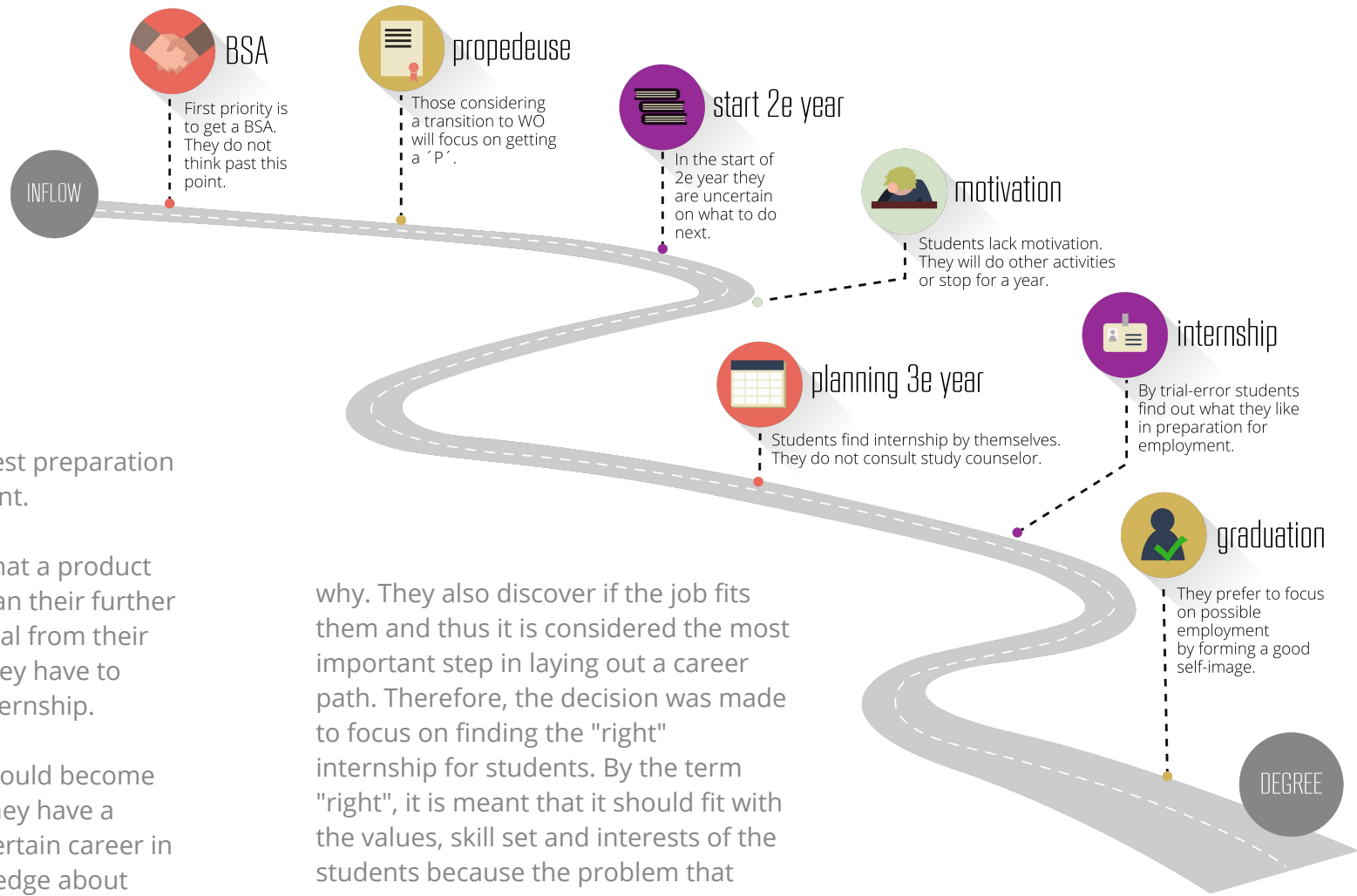


Fig. 5 Study journey

interesting. This is the best preparation they have for employment.

All students suggested that a product that would help them plan their further career would be beneficial from their second year. The year they have to prepare for their first internship.

Students thought they would become more motivated when they have a direction in mind for a certain career in combination with knowledge about their skill set.

Conclusion

An internship is the link between study and employment where students discover what they have learned and

why. They also discover if the job fits them and thus it is considered the most important step in laying out a career path. Therefore, the decision was made to focus on finding the "right" internship for students. By the term "right", it is meant that it should fit with the values, skill set and interests of the students because the problem that occurs at the moment is that students are ending up at the wrong company. This results in a negative attitude towards school, the field of work, companies and themselves. However, in order to find the right match

students should have a better self-image. Self-reflection will play an important role.

2.2.2 Potential market

A market analysis is necessary in order to find out if there are competitors on the market who deliver products aiming for the same goal as intended by the new product for Yubu B.V.. Before the start of the ideation phase a designer must know what is already available on the market to prevent designing something that is already there. Furthermore, if there are competitors on the market they should be analyzed to find out what makes them good or bad. This way you gain knowledge about successful elements that can be considered for the design or what should be avoided.

Method

An overview of the competitors are mapped out in a competitor wheel (Lehmann & Winer, 2008). This method is chosen because of the common grounds the design will have with many other products on the market. With the competitor wheel you search much more broadly because you apply different scopes (product form, product category, generic competition, competition of budget).

The interviews revealed that helping students with the search for an internship and doing a self-reflection on career interests is essential for a career counselling program. In the graduation assignment it is also mentioned that Yubu B.V. likes the idea of reflecting on daily life experiences for the purpose of making career oriented decisions. To use these daily life experiences, they should be captured first. Three diverse aspects (storing experiences, reflecting on them and finding an internship) that

should be considered for the design. If you would look for products that do exactly the above you may not find many competitors. Therefore, a competitor wheel is created for each of the three elements. A description is provided together with the competitor wheels, see figure 6.

Results competitor analysis

Big competitors are the vacancy banks that provide internships for students. There are many and most of them are free to use with many

internship offers. However, they do not provide more than just a list of offers. These lists are hard to get through and not much information is provided. In addition, the offers cannot be filtered based on personal interests.

Other important competitors are the easy career tests that can be done in five minutes which indicates a low threshold for students. It requires very little self-reflection and that is the most difficult part to perform.

Some competitors in the wheel may be turned into collaborators. Especially the social media applications are interesting to mention. Social media is very popular and many provide ways to store pictures, videos and stories. Or in other words experiences from daily life. It may be beneficial to incorporate them because it is already used by a large group of people.

Lastly, it is important to motivate young people to take time to think about their career and therefore other activities they do in daily life form a large barrier. They could spend their time with more fun stuff and therefore these can be

seen as competitors. Here lies potential for gamification/serious gaming.

Conclusion

When looking at all the competitor wheels it becomes clear that many products are available to store experiences that are very successful on the market because they reach many customers (in particularly social media). The way they are designed and how they motivate people can be used as inspiration. Especially if the design also contains a social element. Adding a social element to the product allows students to help each other out. If experiences related to their careers can be shared with others they can learn from each other.

There are many products that help students with reflecting, but a link to employment is never made. If a student has a good self-image, what does it mean for the type of work? Where would he or she feels comfortable? What type of company? Vacancy banks cannot make that connection because it is not more than a list. A potential for Yubu B.V. is to make that bridge.

Storing experiences

- Product form: storing career relevant experiences from daily life
- Product category: storing experiences from daily life
- Generic competition: sharing & storing thoughts, stories and fiction
- Competition time expenditure: hobbies, spare time activities

Self reflecting

- Product form: reflecting on career relevant experiences from daily life
- Product category: reflecting on daily life experiences
- Generic competition: reflecting in general
- Competition time expenditure: hobbies, spare time activities

Finding a suitable internship

- Product form: finding a suitable internship through self reflection
- Product category: Finding internships through vacancy banks
- Generic competition: Other ways to find internships
- Competition time expenditure: hobbies, spare time activities

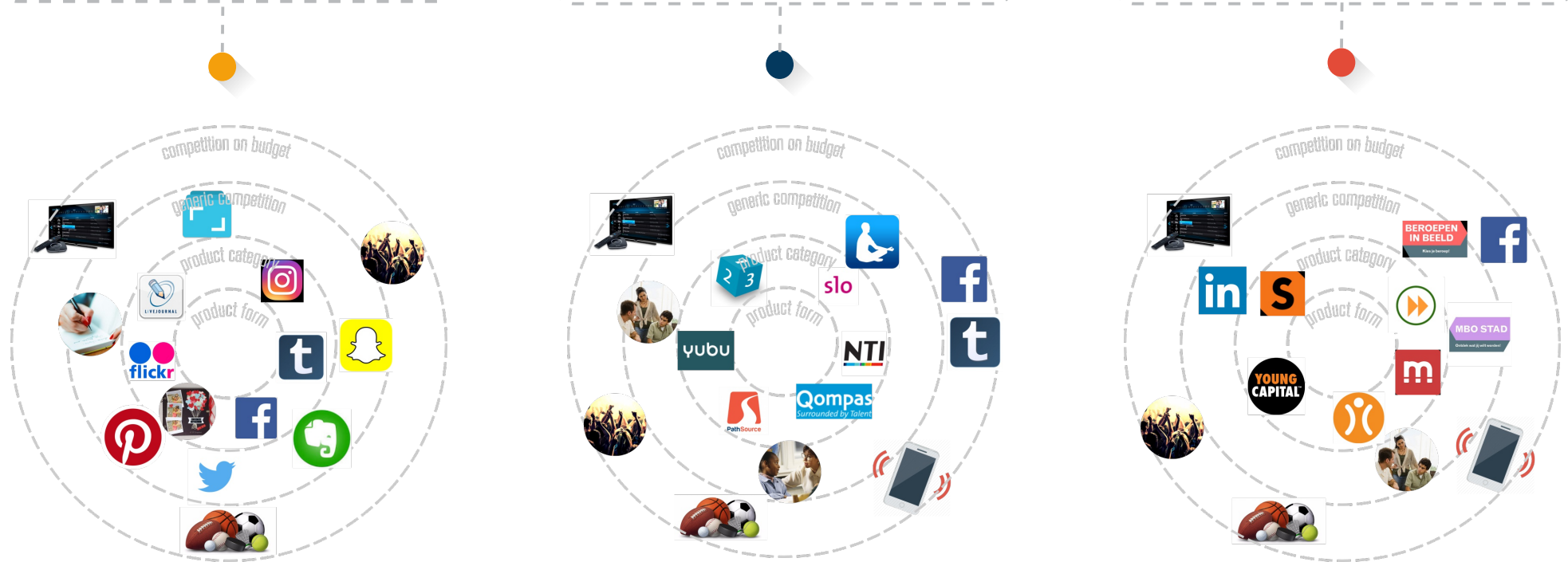


Fig. 6 competitor wheels

2.3 Making well-considered decisions

The results of the analysis phase revealed that a product should be made that helps HBO students to find a suitable internship because this is the current bottleneck and an important part of their career preparation. How this problem should be approached is explained with a design vision and a design brief.

The design vision is fundamental for the complete project because it describes the unique approach of the product envisioned by the designer. Furthermore, the design brief describes all the requirements for the product in order to fulfill the needs of the user.

In the design vision is stated that in order to find a suitable internship, students should make well-considered decisions with the help self-reflection in a social environment that is shaped in the form of a serious game.

2.3.1 Design vision

The strength of a good designer is to be able to vision the ideal future. It settles the main goal of your new product and is the next step after analyzing the present where you encountered problems that needs to be resolved. In order to do so it is essential to be able to tell clearly what you are aiming for. In order to formulate the design vision, inspiration is taken from the 'Vision in product design' method.

Method

The 'Vision in product design' method is developed by Matthijs van Dijk and Paul Hekkert at the faculty of Industrial Design Engineering at the TUDelft (Hekkert et al., 2009). It is a framework that allows the designer to create products that not only fulfill a specific need, but is also innovative, authentic and reflects the personal values of the designer.

It starts with deconstructing the present by looking at what the

current products are. It is then followed by investigating the interactions the users have with them and in what context they are used. The designer will then discover the flaws of the current situation and is able to vision the ideal context. Out of the future context follows the desired interactions and lastly a product that will effectuate these interactions.

In this project the framework is used to embrace all the information

gathered from the analysis phase and explain what the most important flaws are of the current situation and how they should be changed. The framework provides a clear direction and guidance for the complete project and during the development process the framework is often consulted to check if the project has not drifted to far from the core assignment. This is all captured in one infographic on the next page (fig.7).

The problem definition

Students discover what their capabilities and passions are during their internship. Unfortunately, prior to this period they have to make the decision for what internship to apply. As a result students are uncertain what to choose and many of them end up with an internship they later regret. It is a process of trial-error that cost a lot of energy and time. Another issue that plays its part is that students are trying to contact companies by sending out many emails. However, very few respond and due to this slow process many students do not find an intern on time which results in study delay. Career counseling programs that are provided by the schools should support them in writing a distinctive motivation letter and C.V., but are considered dull, purely informative and passive.

Vision

In my future vision students find the right internship by making well-considered decisions through self-reflection. With the use of a social environment and forms of

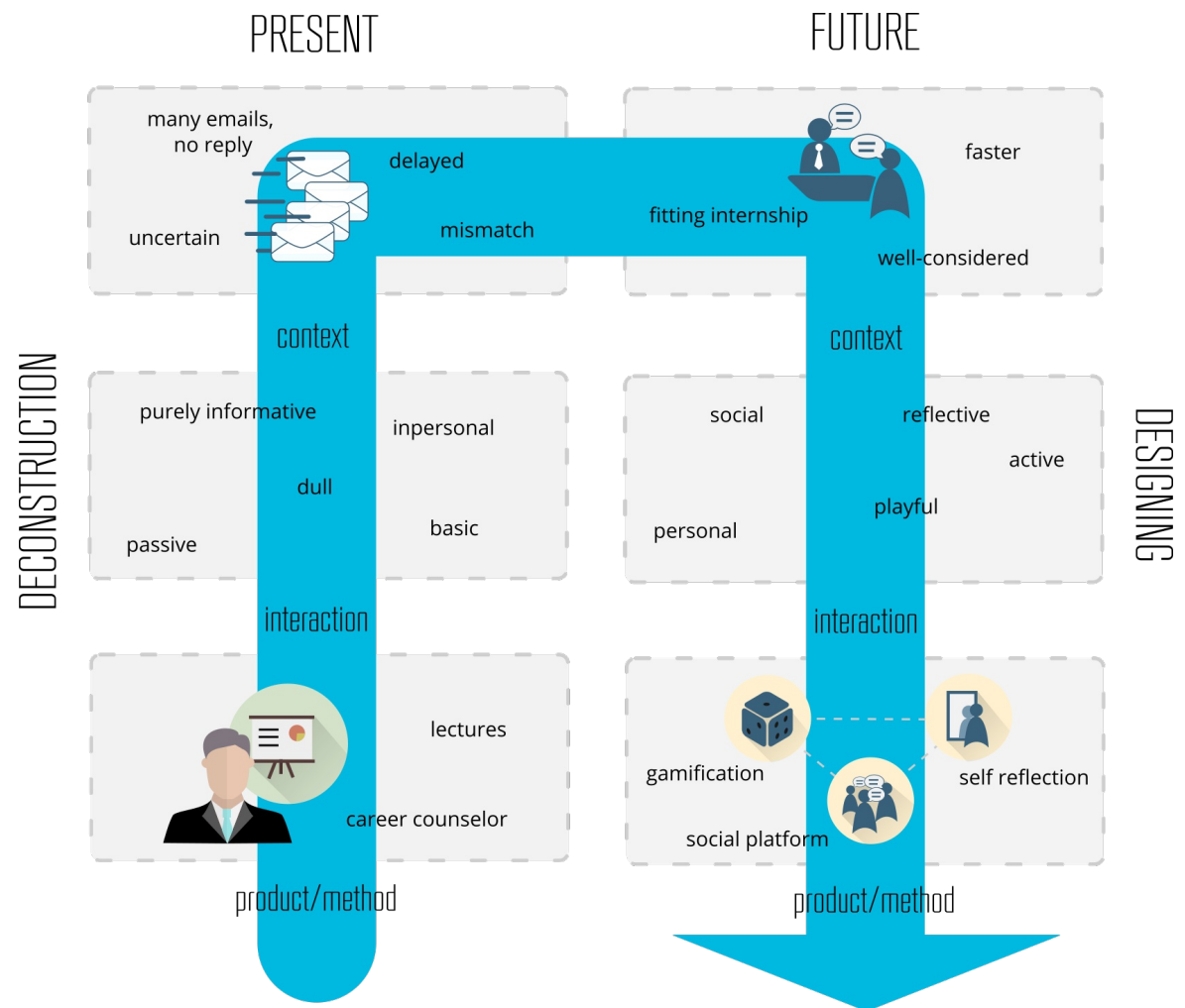


Fig. 7 Vision in Product Design

gamification students will be supported and motivated in this process.

The right internship means that students have found:

- An assignment that fits with their interests and skill set.
- A company that fits with their values.
- A workplace where the student feels comfortable.

With serious gaming an attempt will be made to make students more active and create a positive attitude towards self-reflection (that is usually not taken very serious by students) and make the process of finding an internship less frustrating.

Why using serious gaming?

Serious games have been applied in many ways to motivate users doing otherwise unpleasant activities in real life. It has proven to be successful due to the rising popularity of games in the healthcare and education sector. Many serious games have been developed to increase the self management of people.

A student can make many mistakes concerning choosing an education, internship or a job, but without doubt they will end up at the right place after many attempts of trial-error. This takes a lot of time and the path is chaotic and uncertain. With a serious game you can take this costly trial-error process and bring it into a more secure environment with fast feedback loops. The environment is controlled, but users are free to try out the boundary of the system with little consequences in the real world.

2.3.2 Design brief

At this point in the design process it was possible to create a design brief. A design brief sums up all the requirements the product needs to fulfill in order to satisfy the needs of the target group. In addition, part of the design brief is a list of wishes. These wishes are based on the vision of the designer and the company and are not part of the core elements the product should comply. However, they will make the product richer and more innovative if they are met. The complete list is shown in this section with a short explanation where each requirement is based on.

Program of requirements:

The requirements are numbered based on importance. This order is created using a pairwise comparison.

A. The product motivates students to take career preparations seriously during the complete period it is used.

In the first place the product should trigger the intrinsic motivation otherwise it will not be used for a long period and the effect will be minimum.

B. The product will be adaptable to the developments in the job market.

Markets are constantly changing and in order for the product to stay relevant it needs to be adaptable. Otherwise, the product will lose its relevance.

C. The product should offer results that can alter over time based on changing motives, skills and interests of the user.

Students are in an exploratory phase during their study. They gain new

insights that lead to new career options. Therefore, results should be able to alter over time, otherwise the product is no longer relevant after the first results are provided.

D. The product offers career guidance to help students in finding a suitable internship.

The interviews showed that an internship is a very important moment in the career preparation of students. However, many students find it difficult to choose the right one or find it difficult to get a place.

E. The product offers multiple suggestions for possible internships.

During the interviews it became clear that students do not want to stick to one direction to soon, they prefer insights in possibilities.

F. The product offers many feedback loops.

Finding the ideal career path is a process and therefore the user should get constant feedback in order to keep track of it and steer it if necessary.

G. The product will be applicable for every sector.

The product should reach a large market to become more profitable.

H. The product is independent from career counseling methods offered by schools.

Students indicated that schools cannot offer enough time for good career guidance.

I. The product will be used until the end of the students study period.

Students need time to discover the path that fits them well and there are several moments during their study that they have to make important decision

(choosing courses, internship, graduation project, etc).

J. The product will not be used before the start of the second year.

During interview students suggested that it is useful after the second year. In their first year they are busy getting a positive BSA.

K. The product is intended for the Dutch student.

L. If the product contains digital elements, it should be multi-platform (current systems like android, apple, web, etc.).

Wishes

1. The product makes use of gamification and/or serious gaming in order to motivate students to use the product and provide a playful and engaging user experience.

2. The product will offer a self-image that is matched with internship opportunities.

3. The self-image is created by reflecting on meaningful experiences from daily life and the product helps users defining them.

5. The product is also used by students from university college

6. The product offers career opportunities for an internship, graduation project and first job.
Each decision a student has to make during their study is equally important for their career path because a fitting career path is not chosen at the last day before graduating. It is a process.

2.4 Possible solutions

After the creation of a design vision and a design brief (discussed in previous chapter), it was followed by an ideation phase in which solutions are being devised. Three promising directions were developed together with a scenario and a St. Gallen Business model (Gassmann, 2013). Each direction had some interesting ideas and out of it emerged a concept. The concept was presented to the target group and after the feedback many more alterations were applied to the concept.

2.4.1 Improve communication

The general idea behind the first direction is to improve the communication of one's abilities to possible employers. This will be done by creating anecdotes that distinguish oneself from others based on their own experiences in daily life and use them to create a motivation letter or application letter. They reinforce their self-image as to convince others what their strengths are.

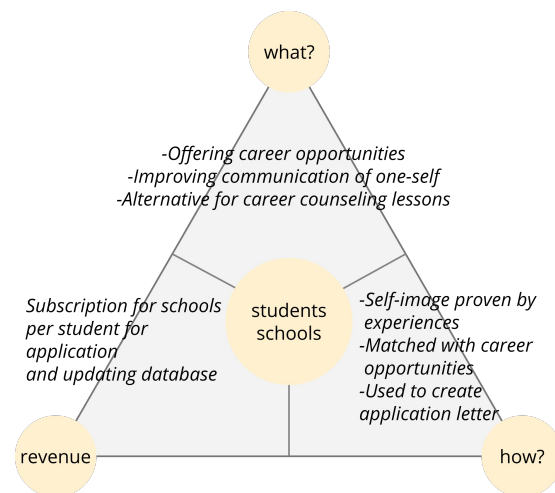


Fig. 8 St. Gallen business model for concept 1

At the beginning users create a talent tree. This talent tree consists of learned skills, born with talents and personality characteristics that are useful to tell during a job interview. The idea to use a talent tree came from video games. Talent trees are used in games to define your game personality based on your preferable play style. It is also used to make a game more interesting because usually not all talents are available at once. You have to buy them from earned points in the game. This idea is also used in this concept. Before

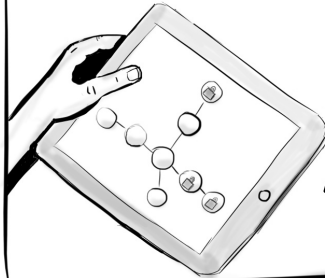
a talent from the talent tree can be used to generate a motivation letter, it needs to be unlocked. A talent is unlocked when the user can link this talent with a matching experience from their daily life that is captured using the application. A video, picture, story, etc. can be used to transform a talent into an anecdote. The user can choose a selection of anecdotes to generate an application letter.

Fig. 9 Storyboard concept 1

First step is to make a self-image.



A talent tree is created. To prove you are right, talents should be matched with examples.



I am good at organizing and I like to work with my hands. I planned a wedding and made the cake.



Career opportunities are shown



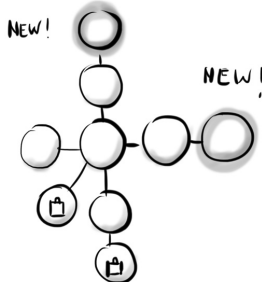
I know who I am and what I want, but how would I get a job?



Unlocked abilities are used.



New talents are learned or discovered and added to the tree.



Your personal portfolio is growing over the years.



2.4.2 Make connections

The second direction involves around making connections with companies that fit the interest of the student. It is more oriented towards the future vision of the student and the ideal employee from the perspective of the companies. The intended place of use is on business fairs where both the companies and the students are participating. It encourages students to start the conversation with companies in order to find out what the possibilities are.

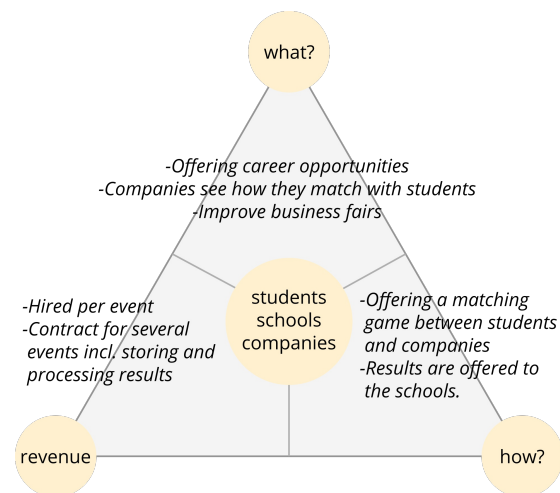


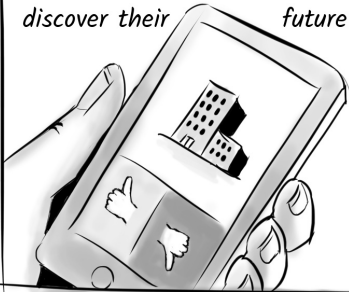
Fig. 10 St. Gallen business model for concept 2

Companies that have a stand at a business fair are asked to create a profile of their ideal employee by going through a series of descriptions or pictures and are asked to approve or disapprove similar to the mechanic used in applications like Tinder. Within a few minutes every company has created a profile before the start of the fair. Students that attend the business fair are asked to do something similar, only they make a profile of their future selves in an ideal working environment.

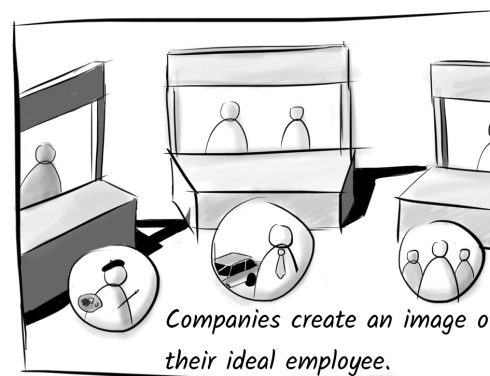
When done, the application will look for similarities with the companies and directs you towards the best fit. Arriving at the stand, a student has a direct conversation starter. All results are stored when the business fair is over. This is beneficial for schools because they can keep track of the effectiveness of the business fairs and if necessary improve it by inviting companies that have better connection with the needs of the students.

Fig. 11 Storyboard concept 2

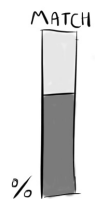
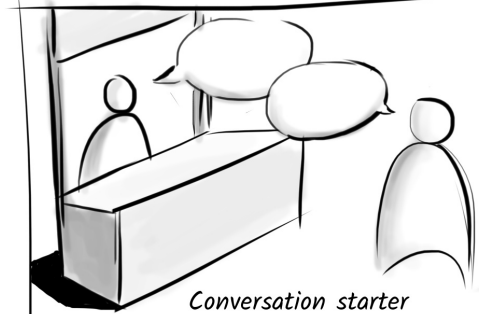
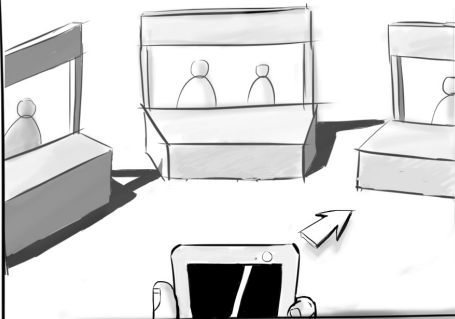
Within a few minutes students will discover their future vision.



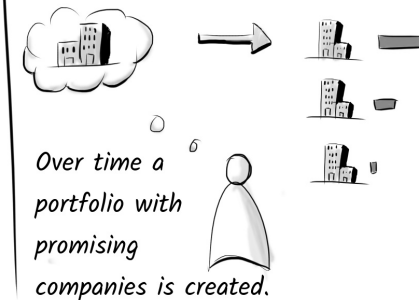
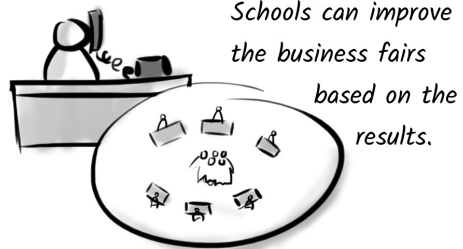
A future vision is visually presented.



The similarities with each company is shown.



- (A) ~ The effectiveness is kept by the school.
- (B) ~
- (B) ~
- (A) ~



2.4.3 Possibilities

The last direction is about discovering job possibilities. All the possibilities are mapped out by students so that the content stays up-to-date and relevant for other students to come. After students have done an internship, they add their experience to the database for new students to discover. The content added by the students stays linked to their personal avatars. New students will now discover these possibilities with their own avatar. This is done by linking avatars based on similarities. Students in search for an internship learn about the experiences from previous students. The concept is about encouraging students to start searching in a fast and easy way.

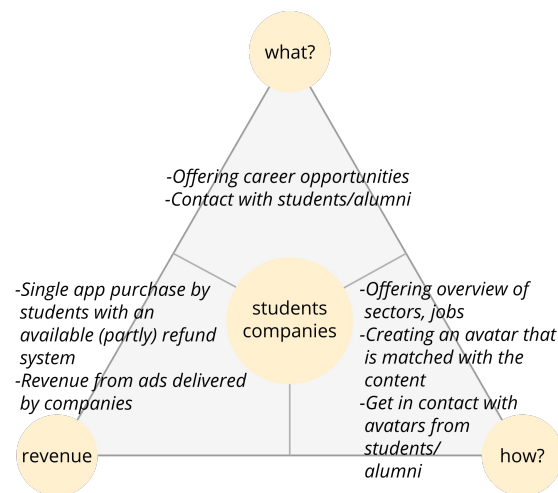
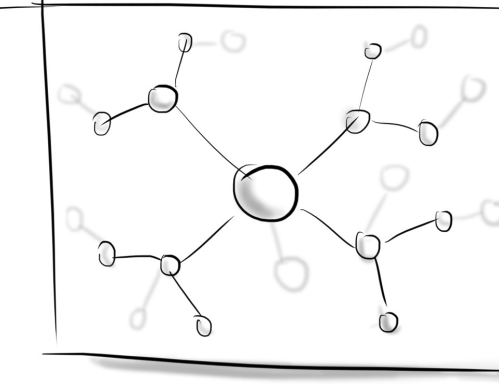
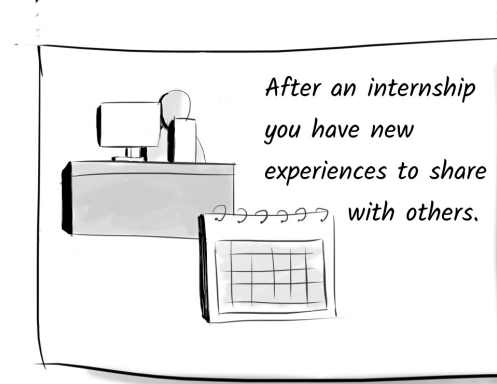
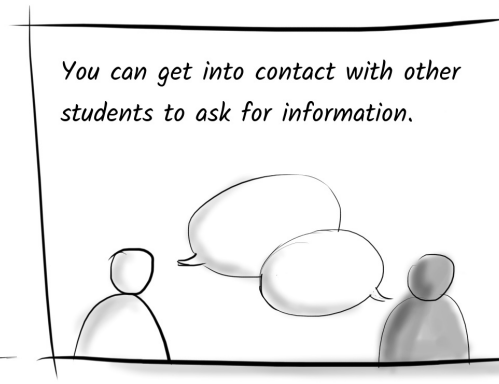
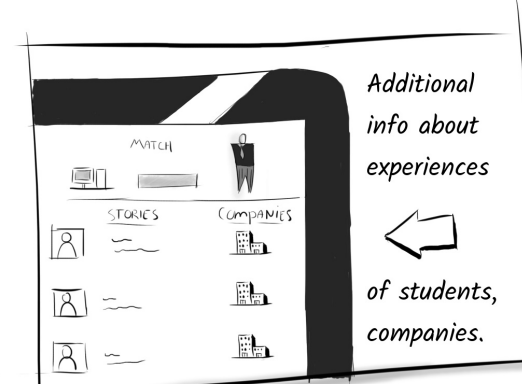
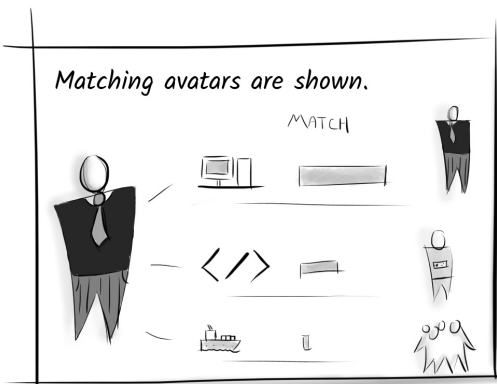
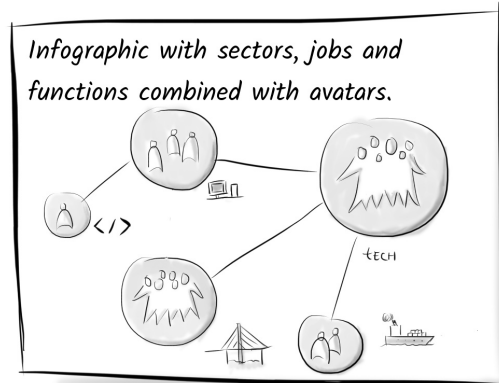
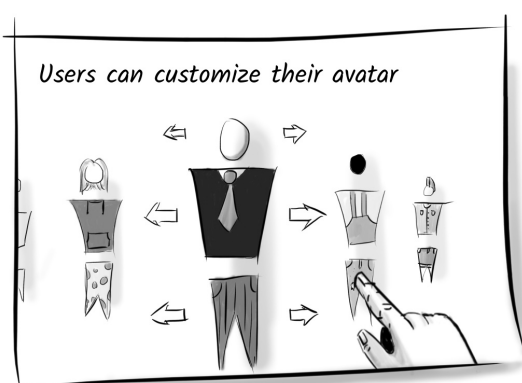


Fig. 12 St. Gallen business model for concept 3

The information added by the students about the companies involves their working experience and some practical information about, for example, the sector it is part of. If more avatars have similar (positive) experiences the program should cluster these avatars and provide them as suggestions for students with a similar avatar. An infographic containing all the sectors and jobs can be created together with the fitting avatars for students to discover.

An interesting business model to consider is to let students pay for the use of the application. However, they are able to get a partly refund for every time they actively helped others by answering for example questions. This can work as a motivation to stay active even if you are not the one that is in search for an internship or job.

Fig. 13 Storyboard concept 3



2.5 Serious game for students

The three directions presented in previous chapters only fulfill parts of the design vision, but all of them contained promising ideas. Many ideas were captured in a single frame of the storyboards. By playing with the different frames (changing order, adding, subtracting) a new concept emerged. This concept was presented to four HBO students and some more changes were applied until it evolved in the concept presented in this paragraph (fig. 14).

1

Players enter the game to learn about themselves (who they are and what they want) and to explore the world of internship opportunities in order to find a suitable one. They do so by creating a character that is a representation of themselves. This is an important part of the concept because their character is actually a profile that will be matched with companies.

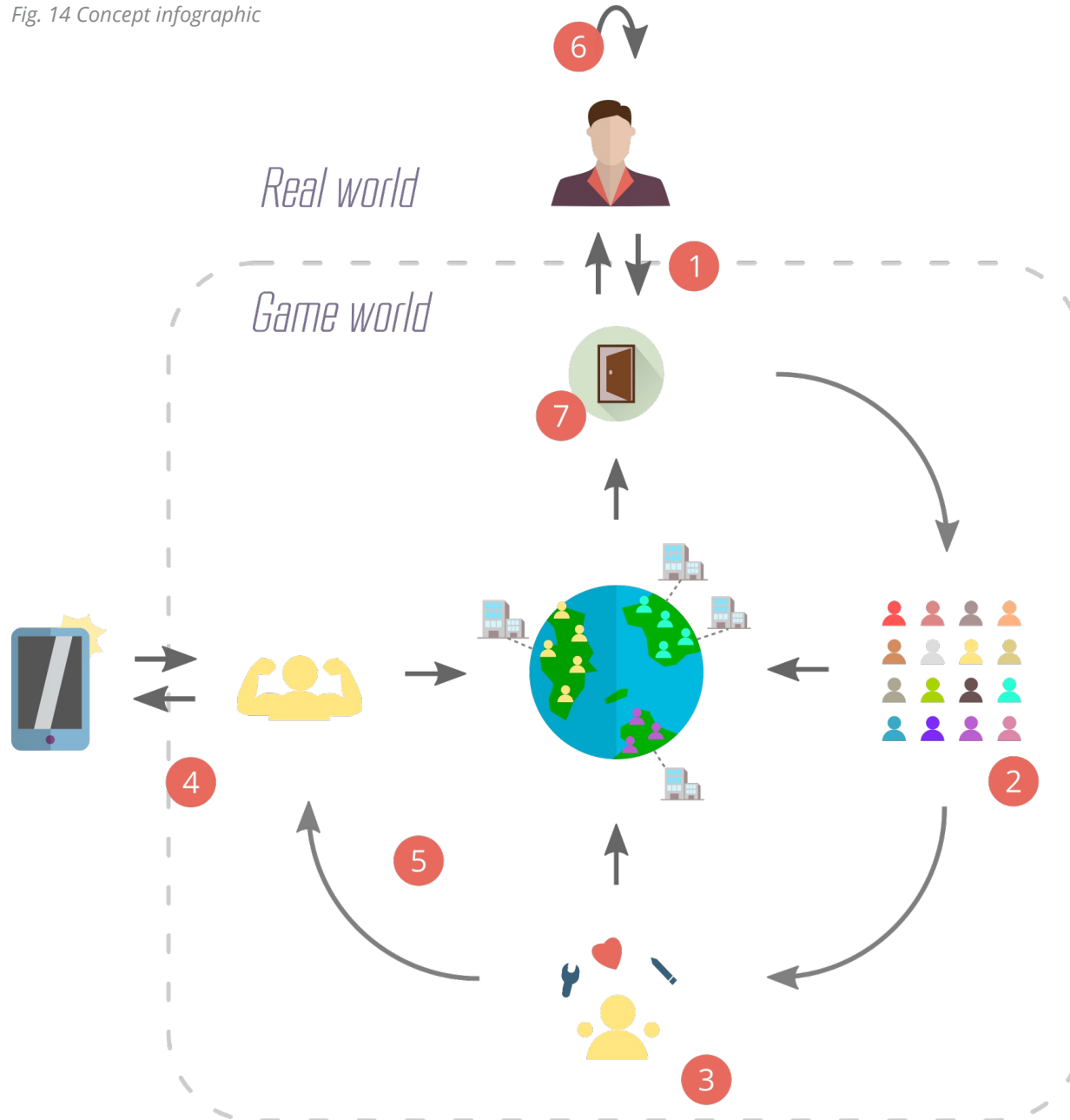
2

To get students to start quick and easy. Students choose from a set of characters and they pick the one that appeals to them most. Each character has a predefined personality based on the personality types from the Myers-Briggs Type Indicator (MBTI) (Myersbriggs, 2017). This will be their basic character in the start of the game and the game world is already accessible for exploration.

3

The chosen character contains little information about the values and skills of the student and is therefore very basic. Students can add their skill set, motives and values so that a more personalized character evolves. With a more in-depth character a more refined match can be found with one or more companies. The student can start searching in every stage of his or her character creation.

Fig. 14 Concept infographic



4 Telling someone about your skills and passions is not really convincing without showing examples. In this step students document their characteristics with daily life experiences (story, picture, video, etc.). It will strengthen their character and gives several benefits in the game.

5 With a more advanced character students can search more refined for internships. Their character is matched with companies where comparable characters have worked for in the past and were added to the company profile.

6 Students can always enter the game any time, anywhere, with every character. It is designed to be fully dynamic and without boundaries because the process of trial-error will be performed faster, in-game and with no consequences.

7

After the completion of their internships, students are asked to evaluate the company culture. Their character description with the evaluation will be attached to the company profile. The trainees are also asked to talk with the company if they want a successor. This way students help each other out by keeping the system alive with many internship offers.

Additional preferences

In order to make sure that the concept will be used, it has to trigger the intrinsic motivation of the students. The method of self-determination theory (Ryan & Deci, 2000) developed by Edward L. Deci and Richard M. Ryan teaches us the basic needs to trigger intrinsic motivation. Competence (experience mastery), relatedness (interact and connect with others) and autonomy (control the course of life). With this information it was possible to write down some of the concept preferences (fig. 15).

Competence

In order to feel competent a student needs:

- To have control over the outcome of their character (personalize). If the student's interests change over time or certain competences are improved, the character should adapt to it and change together with the student.
- To feel confident about the match with the internships. The concept should provide a recommendation to the student.

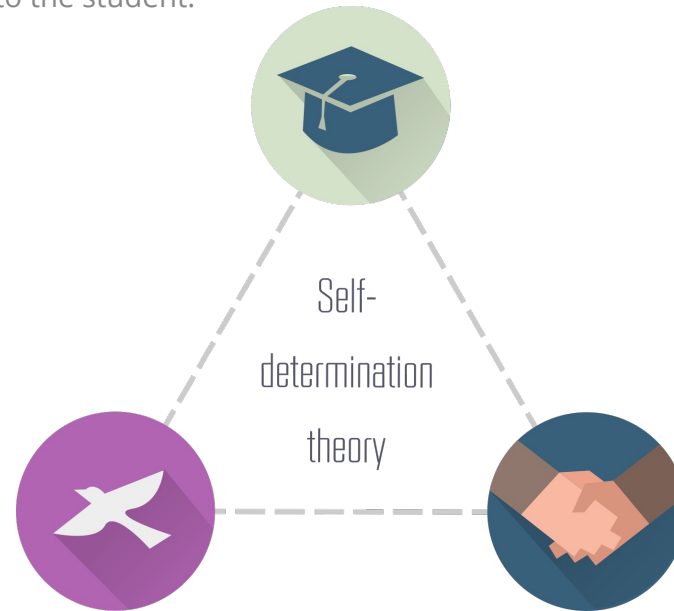


Fig. 15 Self-determination theory

Autonomy

Students are free to go anywhere in the game world. They decide what to explore and how (or with what character). The matches given to students are recommendations and not meant to stereotype them.

Relatedness

Students create a feeling of belonging if they look for characters with similar interests. They will learn from the experience of characters who previously did an internship and may get inspired by them. This means the concept should provide the experience from previous students and link them to the companies for others to see.

2.6 Documenting daily-life experiences

The character elements (skills, personal values) can be documented with daily-life examples and students are asked to search for them outside the game world. By doing so they strengthen their character and it will improve the confidence of their own self-image. However, what are relevant experiences? And what way should they be collected? Do they search for a specific experience or do they collect many and decide later on what is important? The daily life context of the user group has been investigated and the research revealed that it is better to search for specific examples from daily life to document skills and personal values.

Method

Context mapping is a method to perform research that involves users in an active way because they are the experts of their own thoughts and behaviour. Qualitative knowledge about their past, current situation and their future vision will be collected by placing the users in the role of experts/researchers (Sleeswijk-Visser et al., 2005). Users express themselves by telling stories about their experiences through artifacts that is created by them with the help of tools provided by the designer

(collages, models, etc.). In preparation of a context mapping session a sensitizing activity will be done by the participants. This will help them to prepare the session by collecting relevant material.

The decision was made to include forms of gamification and/or serious gaming as part of the session. The reason for this is to make the session on one hand more fun, but on the other hand also more engaging and therefore taken more serious by the participants.

Research questions

Valuable results can be obtained by clearly defining the research questions. The research questions should not be too specific (especially for the sensitizing activity) because participants will otherwise think only in solutions while you are more interested in how they behave and think about their daily life so valuable insights can be found in a broad spectrum. This session is designed to find out if daily life experiences are useful for creating a self-image and what way they should be collected.

The following research questions are formulated:

- What do they experience in daily life and how relates this to their personality?
- From these daily life experiences which say something about qualities useful for employment?
- If they were asked to tell anecdotes during a job interview what would they tell?
- Is it helpful to look at experiences together with someone else?

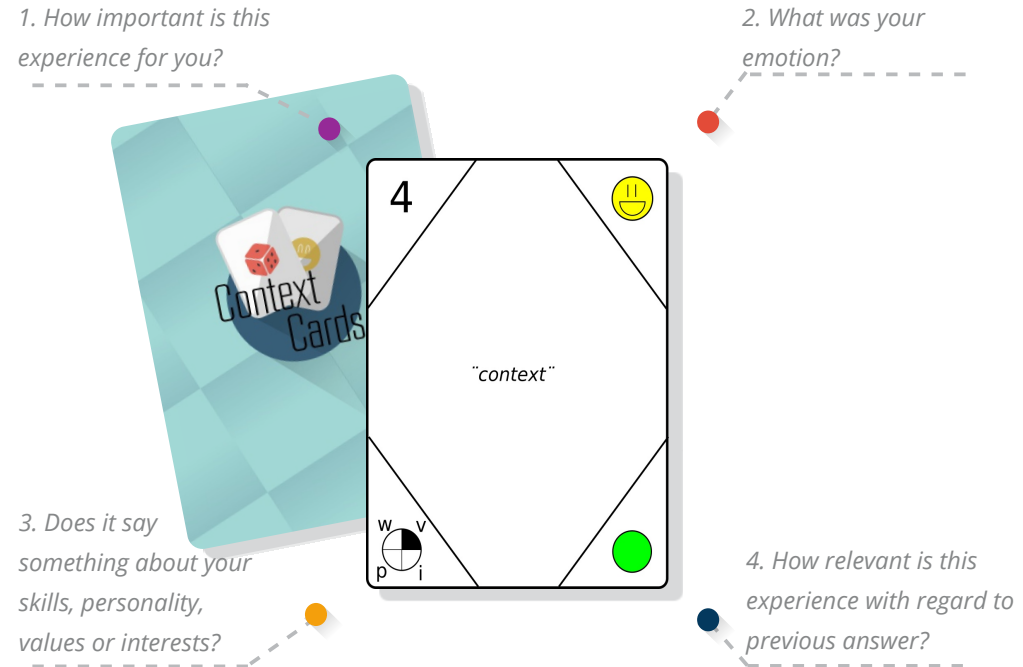


Fig. 17 Sensitizing card

Fig. 16 Sensitizer package



Participants

The session was carried out with four students from different study backgrounds. One industrial design student (m), two students from media design and communication (f) and one student from mechanical engineering (m). All students were studying at a HBO school with exception of the industrial design student who studies at the university of Eindhoven.

Sensitizer

For the sensitizing activity students were asked to do assignments for one week. Each day they were asked to make an unique playing card by capturing an experience of that day (through drawing, writing, or other forms). Then, they answered four questions about how relevant this experience was and what it tells about their personality (Fig. 17). The cards were taken to the session to be used in a group exercise (game).

Group session

The first exercise is a game played by all the participants. The aim was to order the sensitizing cards for each person on relevance with regard to possible career options in line with their interests and study. All the cards of one person are laid down on the table and every round all the players were asked to choose one card in their mind that is considered the best. Next, the player who created the cards is asked to elaborate his or her own choice and every player who had chosen the same card as the player that created it, earned points. Those guessed wrong had the opportunity to convince the card owner why their chosen card is important as well. If successful they earned points. After all the cards are placed in order, the cards from the next person is laid down on the table. The game starts again and this continues until every person has ordered his or her cards.

In the second game players were asked to think of anecdotes from daily life they would tell during a job interview. A player writes his or her dream job on a paper. Next, each player (including the player who wrote down his dream job)

thinks of an anecdote that he or she would tell (this could be anything and fictional) and writes it down on a card. Everybody gets one minute to elaborate their cards and a winner is picked by the person who wrote down his or her dream job. This is done twice and then the game starts again, but now the next person is the one for whom anecdotes are created.

Afterwards, some questions were asked about how they experienced the session and if it was helpful to look at the experiences together.

Results

The following insights were found:

- Not many people wrote down experiences in the category of motives during the sensitizing activity. During the session they also rarely came up with experiences that fall in these categories. This suggests that it is rather difficult to think about experiences related to motives. Skills and interests are much more easy as they were written down more often.
- Not many experiences gathered during the sensitizing activity were relevant. This suggests that it is

better to not collect many experiences and see which one are relevant, but rather turn it around. Let people first learn more about themselves and then see if they can justify it based on experiences from daily life.

- There is a distinction between experiences relevant for telling something about a self-image and a possible career path. Activities occurred outside school or working surroundings were mentioned to support a self-image and activities in the category internships, projects and other professional collaborations were used to support an ideal career path.
- A problem that occurred when talking about all the experiences people gathered or created, that for each experience one could tell something that would make sense in support of someone's self-image. It is difficult to judge when it is real or not.
- Looking at the experiences together with someone else is only beneficial if people know each other well. Most experiences are very personal and therefore it became clear that there are no specific experiences that should be collected by every student.

A scan of the created cards can be found in appendix A.

Conclusion

The research revealed that it is better to search for specific experiences from daily life in order to document a specific skill or personal value. For the serious game it means that finding experiences should be presented in a form of a challenge or quest.



Fig. 18 Picture taken during the session

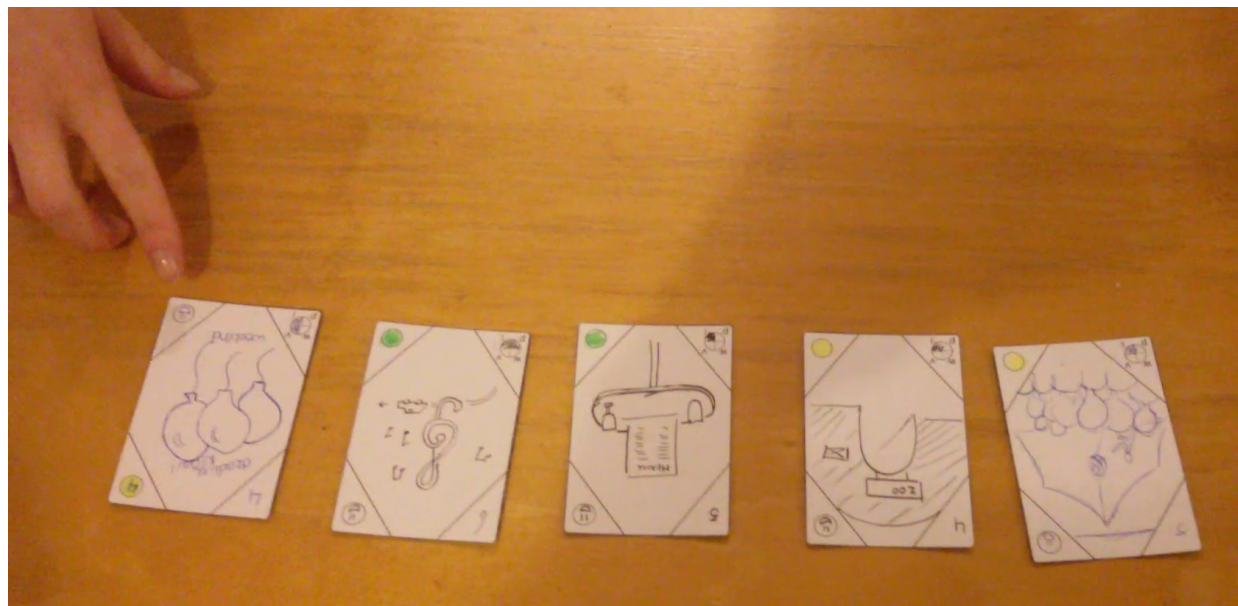


Fig. 19 Picture taken during the session

After gathering experiences for a week the user group did not collect many relevant ones, but they will over a period of several years because skills will be improved and therefore they should be able to update their example.

3. Development of the game's strategy

3.1 Motivating students

Making a serious game that helps students in finding an internship is what will be the result of the project. In upcoming paragraphs the development of the game strategy (how it will achieve the goal) will be elaborated. It starts with defining the motivational drivers to play the serious game which consists of two parts. On one hand you have the motivation to keep playing in the game and on the other hand what the students will get in the end after playing.

For the game it was determined that students should have a feeling of safety and control and after playing users end up with an appointment with a company.

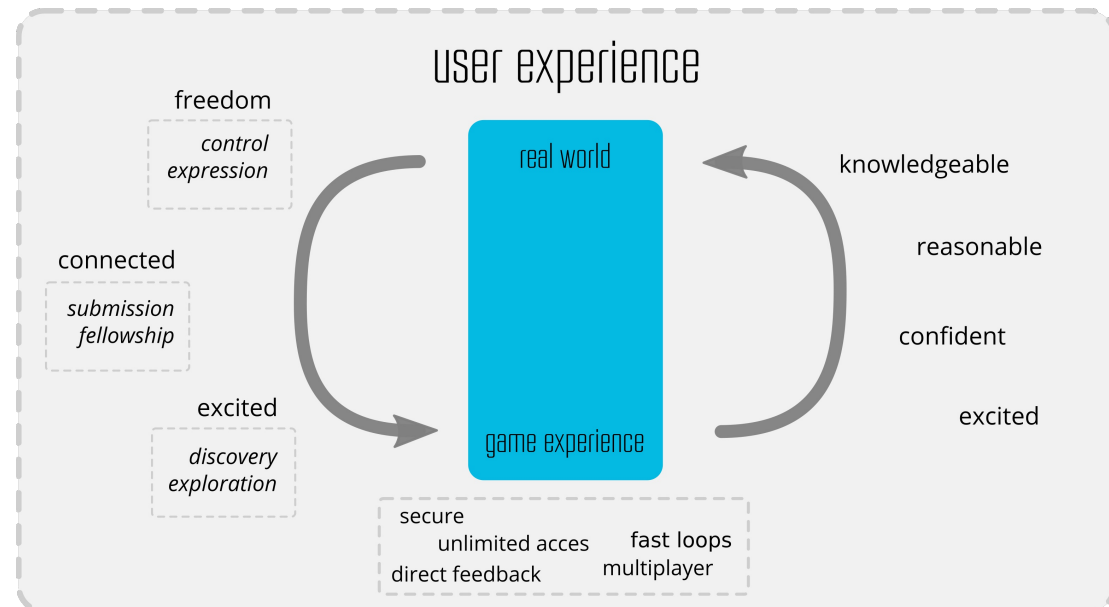
3.1.1 Feeling of safety and control

Before diving into game mechanics and principles, you need to think beforehand about the user experience that should be established by the game. The user experience is closely linked to the motivation because the wrong experience causes people to not play the game again after a first try. The persuasive game design model is filled in with the experiences the serious game should achieve (fig. 20).

Method

PLEX cards (Lucero, 2017) are used to determine the experiences in the game and are placed in the persuasive game design model (introduced in the beginning of the report). A deck of PLEX cards is a framework for designing playful experiences and is developed by Andrés Lucero. In this context it is mainly used to see what kind of experiences exist and which one can be applied to the game.

Fig. 20 User experience model



These experiences are shown on the left side of figure 20 where the arrow is pointing from the real world to the game world.

The right side of the image shows the state of the student when leaving the game.

In-game experience

The idea behind the concept is to let students **discover** what internship will fit with their personal interests and skill set. To let students do the exploring instead of recruiters or schools better results can be achieved because part of the **exploration** is also the exploration of one-self. With a more profound self knowledge the student can make his or her own decision. This gives a feeling of **control** over their own destiny which brings **excitement**.

Students **express** themselves in the form of a character that enters the game world. This character is unique and therefore gives a feeling of ownership. With this feeling students are motivated to take effort in this character to make it as likely to themselves as possible.

The game world

In the game world the character can **connect** with other characters who may have similar interests and who have already experienced the type of work that might be interesting for them. The advantage for the use of a game world is that it is a **secure** environment for the students to explore. It allows them to check every character, company and internship, even the ones that at first sight may not seem suitable. Doing it this way the process of trial-error that is happening now in the real-world will then be brought into the game world so that direct **feedback** is given without time wasting consequences. **Unlimited access** also gives the opportunity for students to do this any suitable moment.

Transition effect

The student must leave the gaming environment with not only a suitable internship but also more profound knowledge about him- or herself. The student should be able to make a **reasonable** decision to apply for an internship and must be **confident** in doing so. If all above-mentioned effects have occurred the student should be

excited to start with his or her internship.

Evaluation

The experiences as they are explained in this paragraph will determine what actions the user should perform and what game mechanics will be added to support them. The experiences also determines on what aspects the serious game should be evaluated after the development.

3.1.2 Appointment with a company

In the concept description earlier on it is mentioned that students are matched with companies who have a suitable internship available. However, is the match motivational enough to use the application or should it go a step further and implementing the interview process? And what is considered a suitable internship? In order to find an answer to both questions a short survey was distributed. The survey revealed that an appointment with a company should be the result after playing the game and that the most important reason to apply for an internship is to find out if the type of work appeals to the students.

Method

To find out what the game should deliver to the students a few scenarios were presented to them and they were asked which one they preferred. The following question was asked: After finding an interesting internship what would you expect from the application?

A Nothing, after finding an offer that interests me, I will make contact with the company on my own for an interview.

B The product should help me in making contact with the company so that I have an appointment for an interview.

C I enroll for the application just like many others and see if I have a chance. A ranking is presented and the company invites a student for an interview.

D I enroll for the application and it will automatically make a selection. It will tell me if I will fit and sends my profile to the company.

The other two questions were also multiple choice. The participant could check as many answers as they liked. The questions were as following:

- What will be your ideal internship?
- What would you expect from the company?

Results

In total 22 students filled in the survey. When looking at the pie chart (fig. 21) it

is clearly visible that answer B is favoured, shortly followed by answer A. This means that it is important that the application should offer a way for the students to get in contact with a company and that they can apply for an internship offer. However, the job application should be done by the students themselves. Speaking with the students also indicated that doing a job application is part of the learning process.

The most important reasons for a student to apply for a certain internship is to discover if they have passion for the type of work or where they can

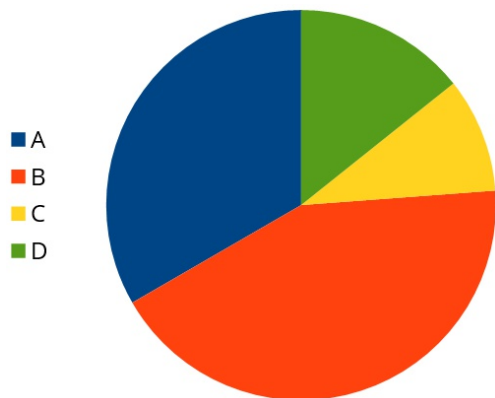


Fig. 21 Pie chart showing the preferred outcome of the game.

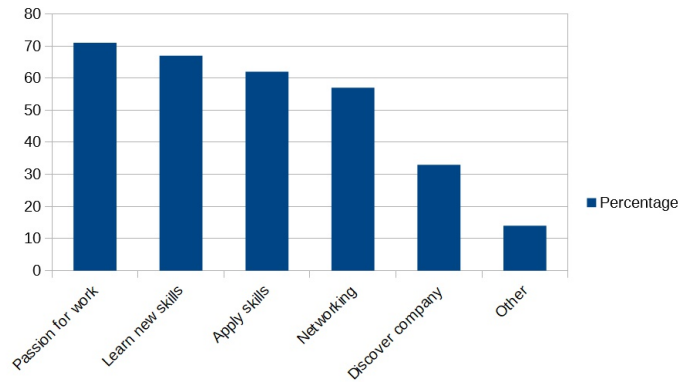


Fig. 22 Ideal internship

learn new skills and apply the ones they have learned. Surprisingly not many students choose an intern to find out if they would like to work for that specific company in the near future (fig. 22). Students prefer to work on running projects and expect coaching from the

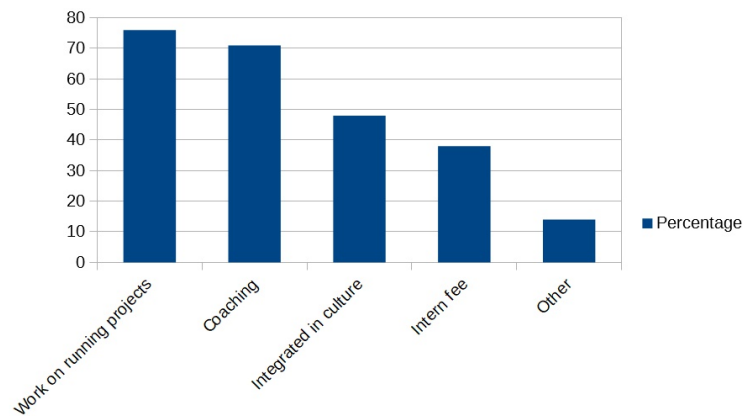


Fig. 23 Expectations of the company

company. Learning the company culture is surprisingly less chosen (fig. 23).

Conclusion

For the game it is important that it should not only provide contact information about the company but also opens doors to the company by scheduling an appointment. This will be the reward for investing in the game by the players.

The above written requirement brought some changes to the original concept. The company will have to play a bigger role if they would agree on inviting students for an application. It should have some benefit for them as well. A more refined offer description made by the company might be the solution. With a more refined offer the company can find suitable students for the job. It ensures that students who have an invitation are possible candidates.

3.2 Reflecting on one-self

Students indicated to have an aversion for self-reflecting in general. However, a better self-image helps students in defining what they consider to be their ideal career path. This starts already by finding the right internship. To ensure that students will perform a self-reflection it should be designed for this specific purpose and it should be more engaging than current methods. Early on in the concept development the decision was made to link the self-reflection with the character creation for the serious game. In this chapter the creation of this character and therefore the self-reflection is covered. An important starting point is to make it as easy and specific as possible but also reach a certain depth. A more in-depth character will result in a more refined offer match.

3.2.1 Character creation model

Until this point the in-game character is mentioned, but not much is said about how this character is developed in the game and how the player uses it to explore the many internship offers. Character creation is big part of the serious game. Therefore, it is important to mention that, although it is possible to do it in a short time, it can also be done over a time span of several years. The user is also allowed to make constant alterations to its character. The character is a representation of oneself and interests can change over time or new skill can be acquired. Therefore, the character should change together with the student.

General approach

A character in a video game is mainly a visual representation of someone or something. On the other hand, a character in a novel is not visually shown, but instead described with much detail. It has predefined motives, back story, personality characteristics, etc.

The character in the serious game contains both aspects. The character will be visually presented because it is also the player's avatar

in the game and it contains a rich character description created by the player. Character creation is a large part of the game. However, is not a fictional one, but a description of the player him- or herself.

The main purpose of this is to create a self-image that later on is used to find a suitable internship. Creating a self-image is just as difficult as creating a profound character for a novel. Usually if people want to learn more about themselves they do several

personality tests with plenty of questions and the result is a very stereotyped description. Another problem with personality tests is that the results can change over time due to changing environments/ situations.

During the interviews students indicated that they do not like long personality tests and stereotyping or reflecting in general. It resulted in a few design principles that were applied:

- Students will only do this for a specific purpose, namely finding an internship.
- Students should be able to reflect on the things they think are important to them.
- It should be easy and fast with minimum writing as possible and not too many questions.
- The design should be careful with stereotyping and assigning students to strict personality types.
- Not all students are able to reflect on the same depth and this should be taken into account.

Character creation model

A model (fig. 24) is created with the above-mentioned design principles in mind that comprise the essential areas a student needs to reflect on in order to define what will be the right internship. The model contains four areas for students to explore; company preferences, personal mission, skills and passions and each one contains several elements. The element closest to the center is more internally focused. You can think of the core feelings and values of a person. The elements further away are more externally focused and describes the

relation the element has to the environment of the students. Knowing, for example, a passion in a broader sense from what it means to the student and how this reflects on their

surrounding will create a complete picture. Students can decide to start at either ends of the spectrum and work towards the other end. This model is intended as an open system were

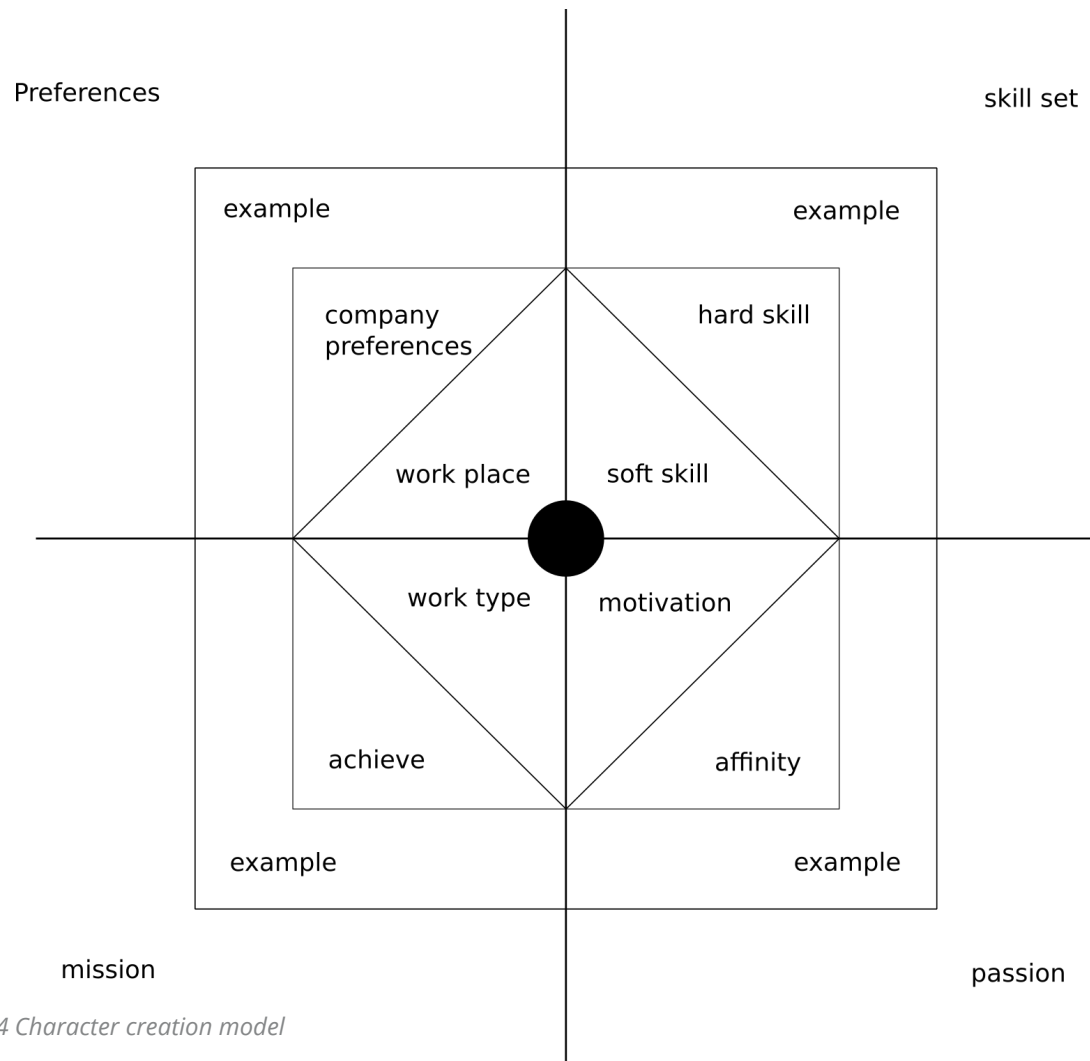


Fig. 24 Character creation model

students decide where to start and what to fill in.

Theory

Students are asked to do a self-reflection, which is an individual task where someone has to travel to his or her inner self. The results can be abstract, but in order to link it to an internship offer they should be turned into something that is more specific. To ensure that students can reflect on abstract things while the system is still able to match it with offers, two well-known theories are combined and applied to the character creation model. The IKIGAI theory (Sone et al., 2008) and the Myers Briggs Type Indicator (MBTI) (Myers & Myers, 1962).

IKIGAI

IKIGAI (fig. 25) is a Japanese concept that helps people in finding out their own "reasons for being" (Sone, 2008). It contains four pillars that if you manage to fulfill and combine in your daily life you probably have a happy fulfilling life. The model describes what is important and what a person should ask him or herself, but it does not provide you with answers nor gives you tools to achieve it. A person

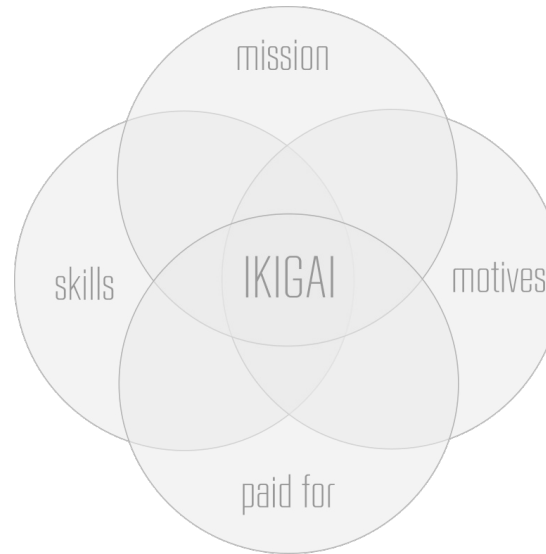


Fig. 25 IKIGAI model

has to find that out for him- or herself. It is not a psychological model, but rather a philosophical one and the decision was made to use this model as inspiration. It is easy to understand and what it makes it rather unique is that it tries to let a person think in combining all that is important in his or her life. All with the purpose to let a person feel happy and satisfied in every moment and every place. A common thought is that work is just work and that it needs a clear purpose. Hobbies are just hobbies which you do for fun, etc. But what if you can combine all?

Many matching websites designed to find, for example a job, only filter based on skills, education and work experience. By using the IKIGAI concept, terms like complicated work titles and educations are ignored and replaced by the values of a person. This is a rather new approach, but many times people end with a different job than they initially studied for. What a person drives seems to be more important than the titles attached to his or her profile. The IKIGAI concept is used to define the four areas in the character creation model.

MBTI

To help students in answering the questions from the IKIGAI model and to ensure their answers can be used by the application, IKIGAI models are filled

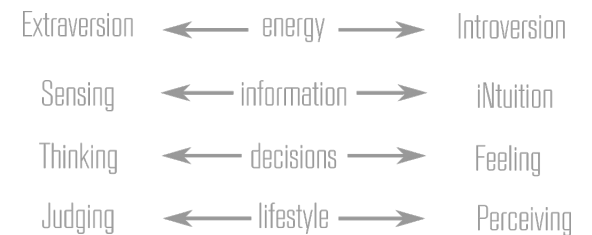


Fig. 26 the four dichotomies

in for the personality types from the Myers-Briggs Type Indicator (MBTI) (Myers & Myers, 1962). The MBTI is a widely used classification method to describe people in the way they perceive and act in the world around them. Every person has a preference for each of the four dichotomies shown in figure 26. In total, there are 16 combinations possible. This model is used by many corporations to find out what kind of personalities their employees have and if every person sits on the right spot. It is used so often by corporations much information is available about the type of work or working environment that fits with each personality type. Therefore, it is used in the character creation model.

Although widely used, the MBTI is also under quite some criticism of which the two most common ones are the lack of scientific proof and that results of the test (the personality type) may vary over time or changes in environment and mood. However, MBTI is mainly used in this context to create questions with answers that the system can use for matching purposes and not for gathering insights in human psychology. For example, every



Practical and fact-minded individuals,
whose reliability cannot be doubted

Fig. 27 Example of an filled in IKIGAI model for an MBTI-type

student type should be able to define the desired workplace based on a few questions. If every student can be matched with an offer based on these questions it works as intended.

The serious game has an exploratory feeling to it because students are able to change their character any moment any time. They decide what is important to them and how they will look for their internship. The decision

to change for example the answers for their ideal workplace is completely up to the student. Therefore, the second criticism of the MBTI is not an issue in this case.

Example

All the MBTI types are analyzed and placed in an IKIGAI model to look for patterns that will help defining the questions for some of the elements in the character creation model and to check if every personality type is able to reflect with the model. An example is shown in figure 27 and more can be found in the appendix B. The sentence underneath the IKIGAI model is quoted from the official MBTI website and gives a good summary of each type ("Free personality test, type descriptions, relationship and career advice | 16Personalities", 2017).

The usage of the model

The model will be used by students to create a character that is a representation of themselves. In the next paragraph each area and element will be explained.

3.2.2 Building your character deck

Each area in the character creation model is represented by a card that will be filled in by the students. Students can create as many cards as they like and these form a character deck. To create this deck students are asked to make separate cards in case the student has several skills, passions, missions or preferences. The reason to think of them as cards has several reasons which will be explained in this paragraph. Furthermore, each card type will be elaborated. Examples of characters can be found in appendix C.

laying card

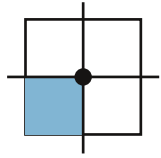
If you would be given just the space of a typical playing card to write down what your personal mission is, you have to be brief in the information you will put on it. You have to create short sentences that forces you to become very clear on what would be the essence of that what you want to say. Keeping it short is also beneficial if you want to use it later on in the matching process because students decide what cards from their deck will be used to search for

an internship. Searching through a set of cards is in that case much faster than reflections the size of an A4 and therefore also visually more attractive.

Structure

Cards consist of three parts who are all related to each other. Generally the first part is the fastest (not per se the easiest) to fill in because of the multiple choice question. For the second part students are asked to write something down in a short sentence. The downfall if you

would only use a multiple choice system is that the searching process will be less refined because not everything can be covered in a category and for example a passion cannot always be covered in one word. Therefore, students are asked to write a short sentence and choose a few relevant keywords from it. The keywords are used as tags similar to the way it is used in social media and this would make it possible to include them in the searching process.



Mission

Mission card

A mission card consists of three parts (fig. 28). The first part is the description of the type of work. Some students may already have a clear picture of what they want after graduation, others have yet to find that out. For the second group it is still possible to answer what type of work they would like to do. The second part is the description of what they want to achieve and the third one an example of the mission in practice.

What type of work suits you?

practical	/	theoretical
solving problems	/	creating order
behind the scene	/	leading
individual	/	society
now	/	future

What do you want to achieve?

What are important key words?

#

What is an daily life example?

Work type

To help defining the type of work that is preferred by the students the MBTI types are analyzed on patterns, differences and similarities. It resulted in a few dichotomies for the user to answer.

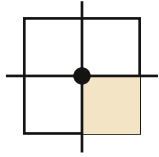
Achievement

In this section students define what they would like to achieve in their work or in their life. Students are asked to write it down in a sentence because it is nearly impossible to include all the personal mission types in a simple multiple choice question.

Example

Student can add an example to their card that confirms what is written down on the card. It can also include pictures, photos and videos.

Fig. 28 Form for adding a mission



Passion

A passion card consists of both a motivation type and a certain affinity (fig. 29). It is difficult to think about the core motivation a person possess. Therefore a list of categories is made that allows the student to define a passion more easily. For example, someone is passionate about cars. But, what makes him so passionate about them? He could answer that it gives him freedom which falls under independence. He likes the speed and the sound which gives him a feeling of power.

Passion

What type of motivation is applicable?

<input type="checkbox"/> acceptance	<input type="checkbox"/> social contact
<input type="checkbox"/> curiosity	<input type="checkbox"/> social status
<input type="checkbox"/> honor	<input type="checkbox"/> protection
<input type="checkbox"/> independence	<input type="checkbox"/> achievement
<input type="checkbox"/> order	<input type="checkbox"/> growth
<input type="checkbox"/> power	<input type="checkbox"/> rewards

What is your affinity?

What are important key words?

#

What is an daily life example?

Motivation

The motivation types are based on different lists published on the internet by consultancies and are slightly changed to fit better in the context of this project ("Types of Motivation - Intrinsic and Extrinsic Motivation", 2017) ("6 Types of Motivation Explained", 2017). For each passion more motivation types can be chosen.

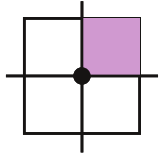
Affinity

Students can write down what their affinity is/are in a short sentence or with a few keywords.

Example

As an example student could show how the passion of theirs is reflected in their lives (hobbies, work, etc).

Fig. 29 Form for adding a passion



Skills

Skill

A skill card consists of a hard skill and a soft skill (fig. 30). A hard skill is a skill someone has learned for a specific job. Soft skills are more difficult to quantify, but are qualities someone naturally possesses or has learned. A hard skill can be part of a soft skill and therefore they are placed on the same card. A student can, for example, work very well with SPSS software package, which is a hard skill and this means that the person most likely is also very analytic because he works with statistics.

What type of soft skill is applicable?

<input type="radio"/> physical	<input type="radio"/> creative
<input type="radio"/> technical	<input type="radio"/> analytic
<input type="radio"/> relationship	<input type="radio"/> management
<input type="radio"/> communication	<input type="radio"/> people skill

What kind of hard skill do you have?

Write down key words

#

Write down an daily life example

Soft skill

Soft skills can be placed under one of the eight categories. These categories are based on the list published by Skillscan, a platform that creates tools to give career advice. ("Engaging Assessments for Career Development", 2017).

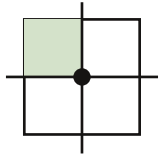
Hard skill

Students can write down the hard skills they have learned.

Example

Students can upload a file that is part of their portfolio.

Fig. 30 Form for adding a skill



Preferences

Preference

In the last area students define what will be their ideal workplace and other preferences regarding the internship (fig. 31). They are all separate cards for the student to fill in because the topics are all unrelated to each other.

What is your preferred workplace?

I like to:

work with other people, on teams, and in busy spaces	↔	work independently or in small groups, in calm, quiet spaces
work with concrete things like people, data and machines	↔	works with abstract things like theories, ideas, and possibilities
works that uses their intelligence and lets them excel	↔	work that reflects their own values and helps other people
work in a structured, orderly workplace	↔	work flexible with much freedom

Work type

The questions on the card are based on the descriptions for the MBTI types by Truity Psychometrics, a consultancy specialized in online career tests ("The Best Career for Your Personality Type | Truity", 2017).





Fig. 31 Form for adding a preferred workplace

Internship preferences

The cards on this page are preferences students can fill in about the more practical matters of the internship (fig. 32). If students do not have a preference for some they do not have to fill in the card.

Fig. 32 Form for adding a preference

The form consists of seven preference cards, each with a dashed border and a red dot in the top right corner. A dashed line connects the caption to the top-right red dot of the 'Rules' card.

- Workstructure**
 - hierarchical  circular 
 - matrix  organic 
- Rules**
 - strict working hours
 - flexible working hours
- Coaching**
 - none
 - once a week
 - every month
 - every day
- Atmosphere**
 - competitive
 - controlled
 - collaborative
 - independent
- Student project type**
 - running project, individual
 - running project, team
 - new project, individual
 - new project, team
- Project team size**
 - 1
 - 2-5
 - 5-10
 - >10
- Facilities**
 - own workplace
 - fee
 - social activities
 - lunch

3.3 Discovering internships

3.3.1 Offer creation model

Companies play an important role in the game because they have to create an appealing offer. They use a model for that as well that is similar to the previous explained model for the students. In addition, they have to set some other parameters to help placing the offer in the application. All this will be discussed in this paragraph with some examples in appendix D.

Internship offer creation model

The way students build their character with the character creation model is similar in approach for companies. Companies are asked to create cards that contain all the required information for the internship offer. In figure 33 you see the offer creation model and compared to the character creation model on the left side it is very similar with exception of the name giving for the various areas and elements, but in essence they are the same.

Assignment description

On the left side of the offer creation model are the areas that describe the specific assignment. The right side of the model describes the requirements. The gray areas in the left corner of the assignment description are not filled in by the company, but instead filled in by previous students. Previous students will assess the company culture and their characters will be linked to the company profile. New students can see what kind of characters have worked for the

company in the past. These insights can also be beneficial for companies.

Requirements

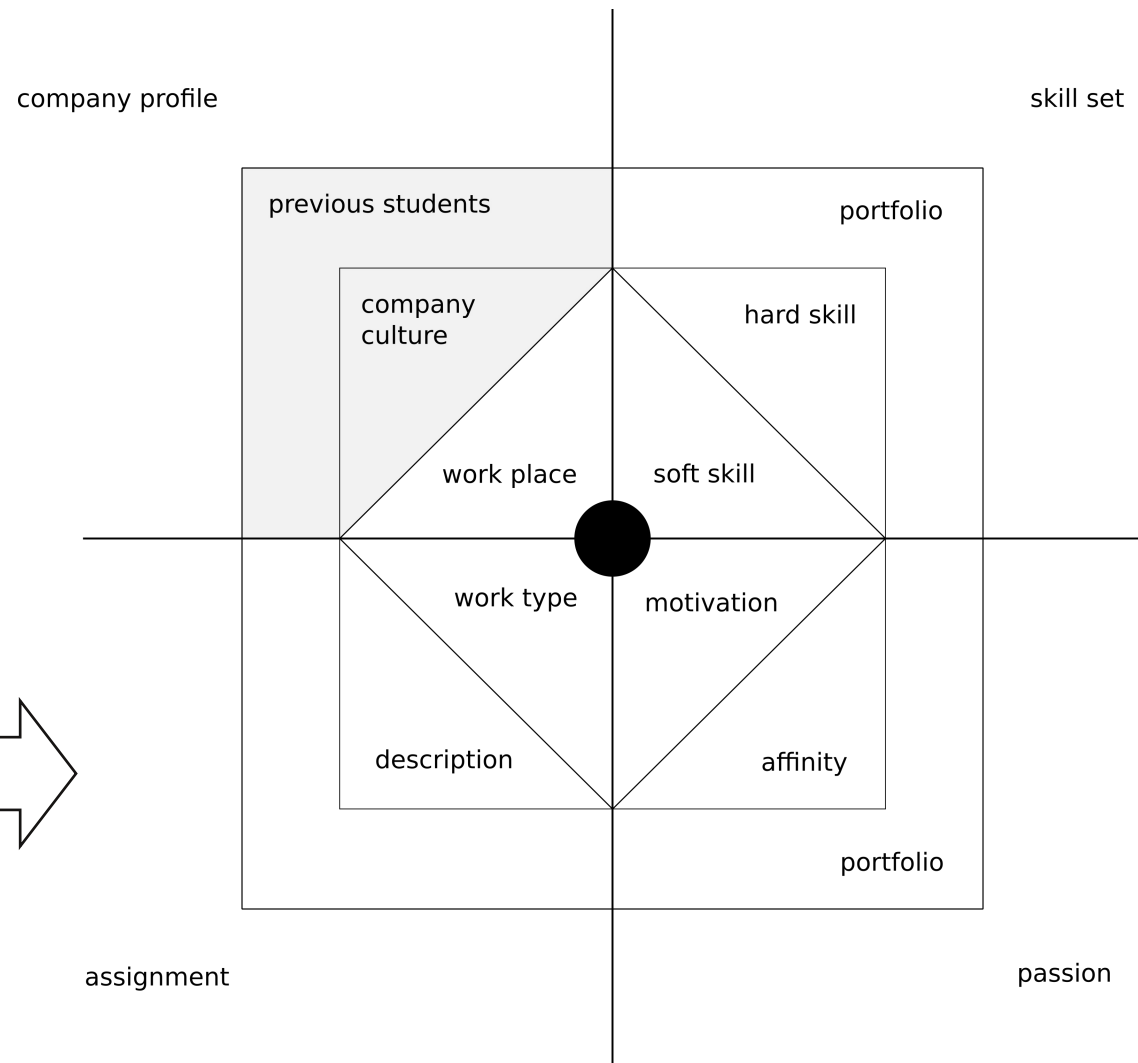
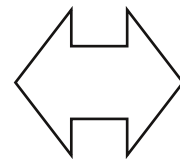
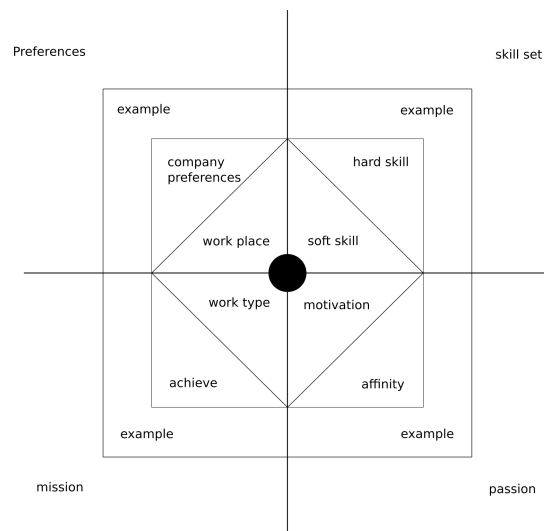
The right side of the model shows the requirements for the students. For each requirement the companies can indicate the need for an example or portfolio.

Parameters

Of all the cards the company created, some of them will be more important than others. The

company can set a maximum of three mandatory cards that the student should possess. Furthermore, the company determines how many students they can invite for the interview. This is important because, if a hundred students apply for the internship it is impossible to invite them all. What determines which students will get the invitation is discussed later on. The company also sets an expire date for the offer to make sure that the system stays up-to-date.

Fig. 33 Offer creation model

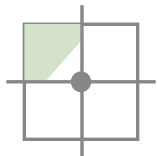


3.3.2 Finding a match

The next step in the process is to make a match between the student and the offer. In this paragraph is explained how this system works.

Predecessors

A part of the offer creation model (top left area) is filled with information from predecessors.



This involves the evaluation of the company culture and an overview of the character types who did their internship at that specific company. The reason for this is that just finished students have the most recent and

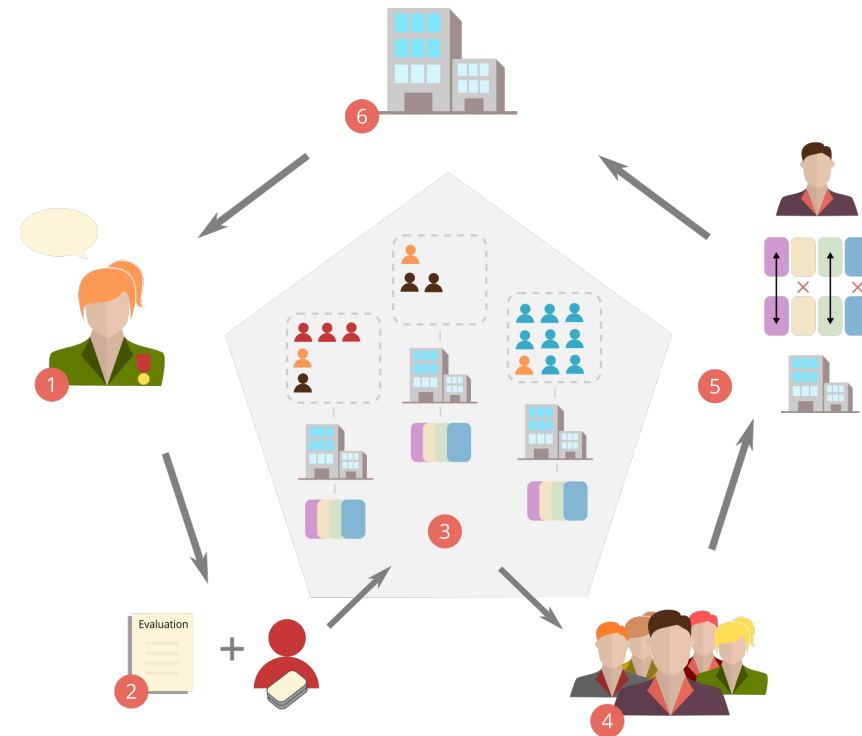


Fig. 34 Matching process

closest experiences with companies. Predecessors are asked to fill in a survey with the same questions as the cards new students fill in to define their preferences. With this system the older students can help the younger generation, who in return help the next

generation so that information stays up-to-date. New students not only see internship offers from a company but also how working for the company is experienced by predecessors (34).

1

Predecessors will also help new students in finding an internship by asking the company if they search another student to take the position as intern after they have finished. If so, the student directs the company to the application so that they can add an offer in case they have not used it before.

Why should they do this?

Many students will do an internship every year. If every student would ask their company if the place is available again, you would automatically create a very large database of internship offers.

Why would they do this?

- It is a social act. Predecessors helped you, now you help the new generation.
- It takes little effort because it can be done within 10 minutes.
- It could also be set as an extra deliverable for school.

2

Students assess the company on its culture (the way of working, facilities, etc.) and the students's character is attached to the company profile.

3

After many successors a profile is being created of the company containing the type of students who did their internship there and an assessment by predecessors.

4

All the information is available for students. The company also has access to their profile to get an idea of what kind of students are interested in the company and successfully did an internship at their office .

5

The matching process takes place based on congruence between the cards of the character and the offer.

6

Offers will be suggested to the students. This is done automatically by the system to keep effort low for all stakeholders. At some point a suitable student is matched and has taken interest in the company. Companies that agreed to put their offer in the system also agreed to invite the students who came out of the match for an internship interview.

Company benefits:

- They have access to many students
- It will take little effort from their side
- A pre-selection have already taken place. This will reduce time for the recruiter of the company

Student benefits:

If students will be guaranteed with an invitation after they used the application they will be triggered to use it properly because of the appealing reward.

4. Serious game design

At this stage the underlying strategy of the serious game is designed. The next step is to turn it into a game so that students can work with it. Game mechanics are designed that will guide the player through all the steps. A theme is designed to create a coherency between the different steps and to give them a certain meaning.

4.1 Mechanics

A game consists of one or several game mechanics. Game mechanics define the rules for the environment the player is immersed in and without them it will not really be a game, but mainly a place where people can play without aiming for a certain goal (think of toys). But why do we need game mechanics for this project? The use of game mechanics in this concept has two purposes. It will motivate students to work towards certain goals (the most important one is getting an internship) and it helps to steer the player in that direction.

Designing game mechanics

On the internet it is easy to find many lists of game mechanics. These lists are presented as ready to use elements you can attach to any process or situation. However, they work to a certain extent for social media applications and marketing. Examples are the progress bar on linkedIn profiles or badges earned on eBay for selling items. However, the goal is to create a serious game that has a specific goal in an enclosed environment with rules. Rather than picking a few mechanics, the decision

was made to design them to make sure every game mechanic contributes in a certain way in reaching the end goal. Every action the players undertake should be meaningful.

The MDA framework (Hunicke et al., 2004) formalizes the consumption of games by breaking them down into three components, mechanics, dynamics and aesthetics. They can be used as a way of viewing games. From a player's perspective it starts with the aesthetics (or "fun") and for the designer the mechanics (or rules). This model describes how games work, but

not how to design them. The MDA framework is, therefore, combined with other frameworks. Each part will now be elaborated with the official definition and how it is designed.

Aesthetics

"Aesthetics describes the desirable emotional responses evoked in the player, when he or she interacts with the game system." (Hunicke et al., 2004)

The emotional responses are already covered in paragraph 3.1.1

where the user experiences are described using PLEX cards.

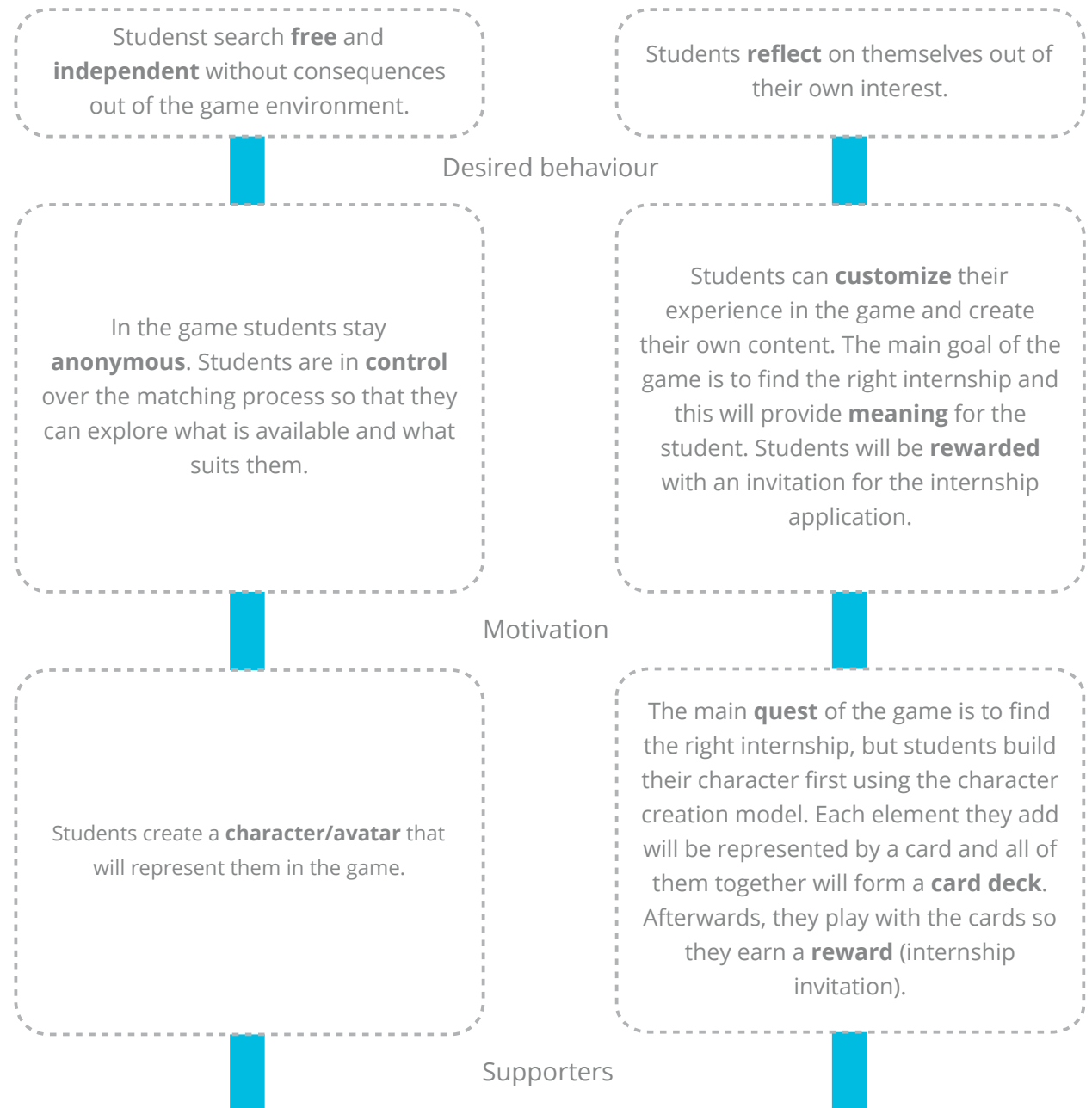
Dynamics

"Dynamics describes the run-time behavior of the mechanics acting on player inputs and each others' outputs over time." (Hunicke et al., 2004)

Andrzej Marczewski, an expert in gamification, describes an approach for designing game dynamics. He explains that designers should look at the desired behaviour the game should provoke and what is needed to motivate the player to act as desired (Marczewski, 2017). Marczewski's Player and User Types Hexad describes the many types of motivations different player types can have and this is used as inspiration to design the dynamics.

Mechanics

"Mechanics describes the particular components of the game, at the level of data representation and algorithms." (Hunicke et al., 2004)



Students make **well-considered decisions** and do only apply for the companies they like.

Desired behaviour

Students work **actively** with the app so they will find an offer as soon as possible.

Desired behaviour

Students fill in their reflection profile **faithfully.**

Students choose their path and destiny by making **branching choices.**

Motivation

The game has build-in forms of **scarcity** to give a feeling that if they do not act they will miss out opportunities.

Motivation

Students are able to bluff their way in. However the penalty of losing things when caught will secure a form of **avoidance.**

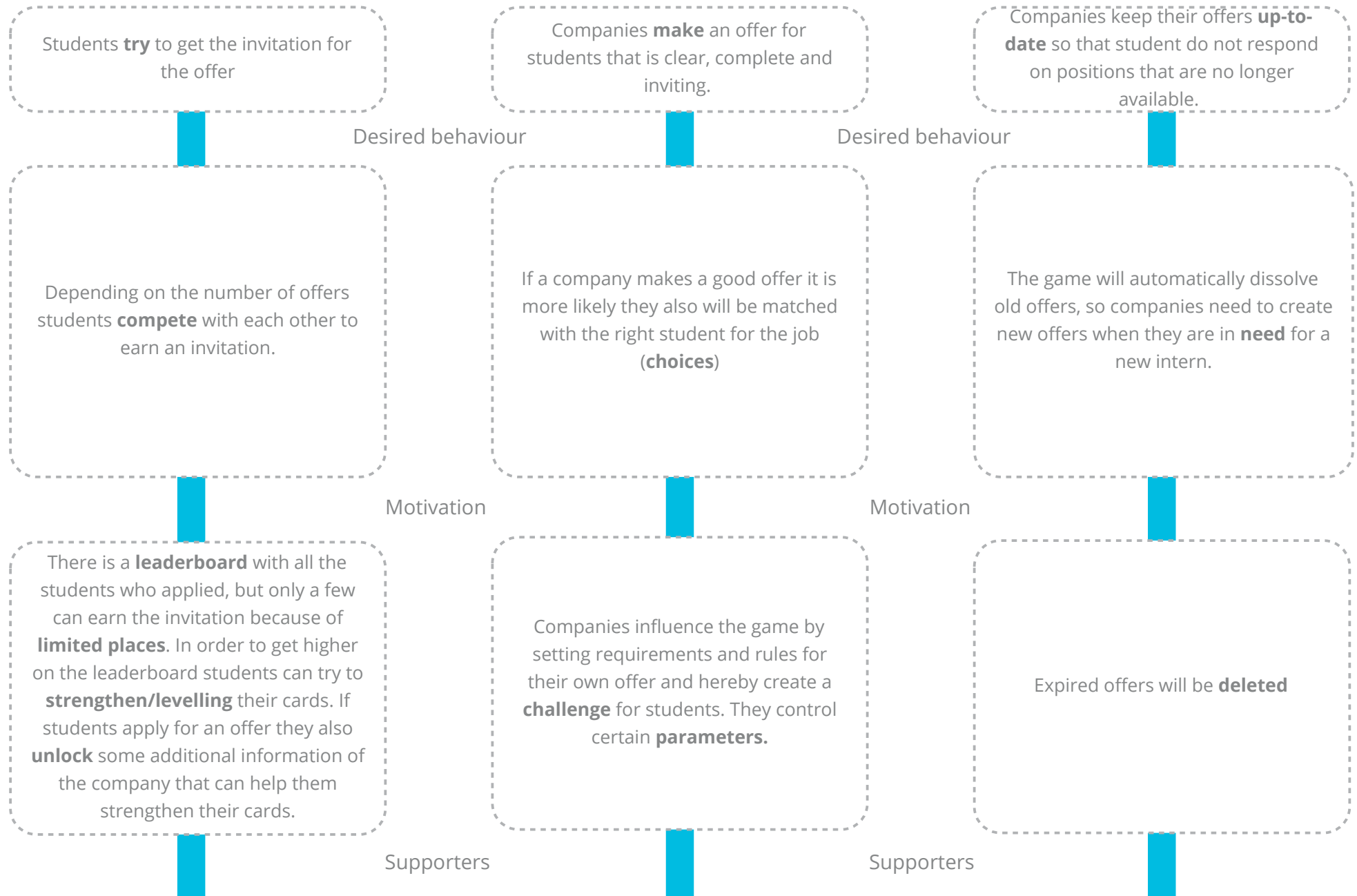
Students play a **mini-game** to filter offers. Students will lay down **card combinations** and offer results will be shown. They can only lay down the cards once during the game. They have to decide either to stop or continue by laying down another card for different results (**take it or leave it**). Students can only apply for a **limit amount of offers.**

Supporters

There is a **count down** for every offer in the game that is set by the companies. If students found an interesting offer they have to be sure they applied before the deadline expires.

Supporters

When a company finds out a student was bluffing they can give a **penalty** to the student. The student will then have two slot less to fill with an offer.



4.2 Avatar

The characters that are created by the students are also their avatar in the game. A few basic principles were applied for the design. First, the avatars are designed so that students are able to identify themselves with the character. Secondly, players should be anonymous. The reason for this is that students should be able to discover without boundaries. If they place themselves in the role of something else, they feel less bounded by their own comfort zone. In addition, if they want to apply for an offer, they cannot be rejected based on ethnicity or gender.

Early on in the design process people from the target group are presented with a sheet of avatar types (see appendix E). They were asked to tell what would be their preferred avatar and why. Many preferred the animal avatar and therefore the decision was made to continue designing with animal types in mind.

Taking animals as a starting point has several benefits:

- It is anonymous
- It is gender/race neutral

- Animals are used many times in the past to describe human behaviour (the brave lion, sly fox, etc.)
- Most people like animals

Students will make their basic avatar at the beginning of the game. This is also part of the character creation model where students define their ideal workplace and is, therefore, integrated as a tutorial. Defining the ideal workplace is done by answering four questions of which the outcome is one of the 16 personality types from the MBTI. Each type is represented by a

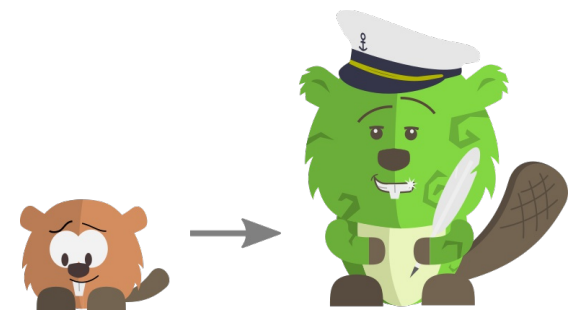


Fig. 35 Character growth

wild animal to give the feeling of freedom which is part of the desired experience of the serious game. The character will be created step-by-

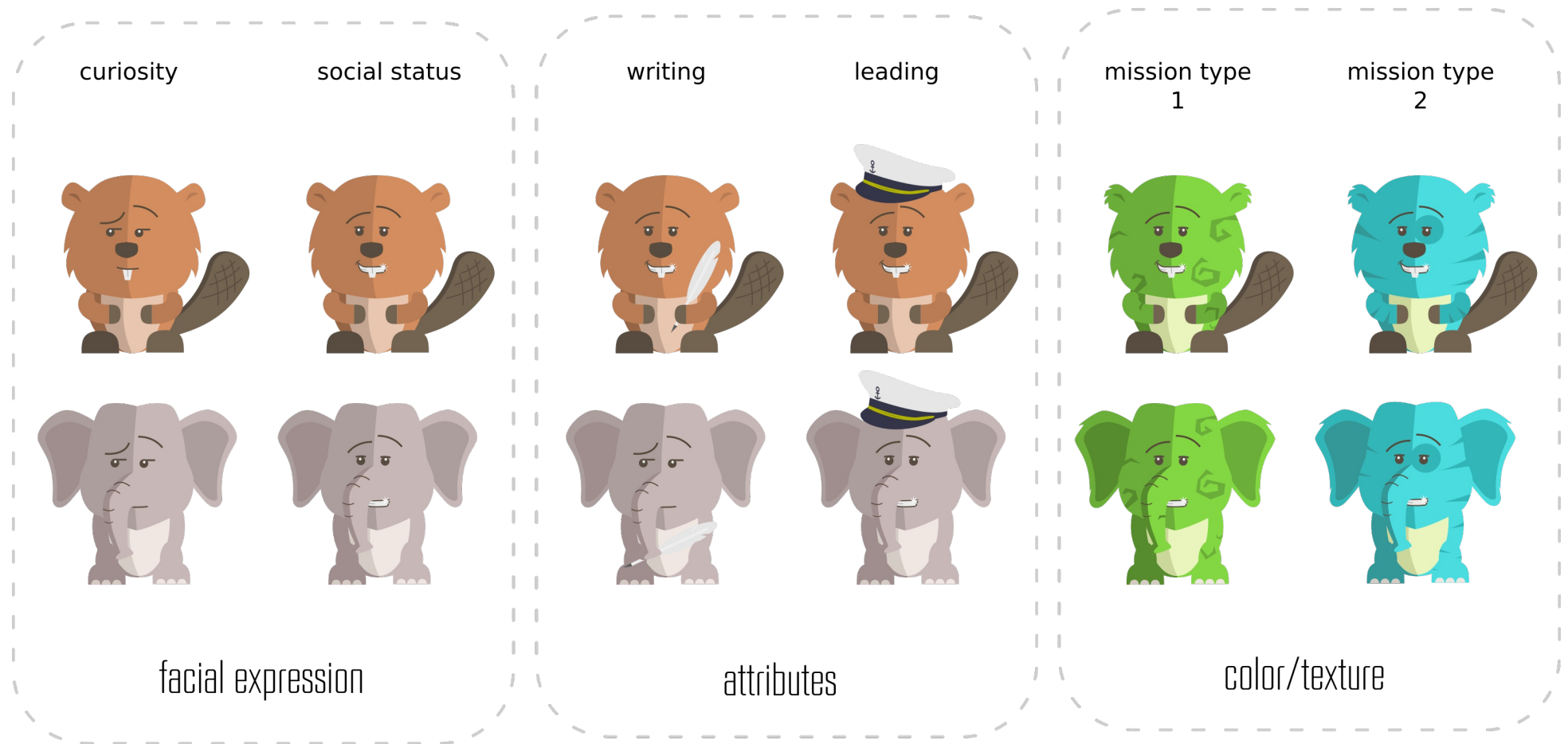


Fig. 36 Character appearance

step as students add more cards to their deck. During these development steps the avatar will also transform. It will start as a normal pup and will be transformed in a fully unique animal (fig. 35). The changes applied in the character model results in visual

alteration of the animal as shown in figure 36. For each type of skill, passion and mission, a different part of the animal will change. Each skill type represents an attribute, each passion type a change in posture or facial expression and each mission type in a

change in colour and texture of the animal. If a person has more skills and passions, he or she can choose which one will be used for the character.

4.3 Metaphor & theme

The serious game consists of several steps to complete by the student, they are all related to each other, but the link between these steps are sometimes difficult to see or understand. Every step is given a certain meaning with for example a metaphor and is connected with each other through a theme. Furthermore, at this stage the game is named, Bubo, which is the latin name for Oehoe and throughout the game an Oehoe in a lab coat will guide the players through the game.

Metaphore

Finding an internship and doing a self-reflection are both considered "heavy" tasks by the students. By making a serious game an attempt will be made to make this process feel less of a burden. The decision was made to give the serious game an appearance of a real game to make it all more lightly and to bring a bit more humor into it.

The serious game can be divided into three main steps. Doing a self-

reflection, searching for a suitable internship, trying to get the position. Showing these steps to the user in this form is not very inviting. Therefore, the steps are given some metaphors.

Theme

Building a character based on the model (with skills, passions and missions) results in a unique character for each person. To show this visually a scientific theme was applied because it fits with the image of the schools (a place where

you gain knowledge) and is also commonly used in popular games (e.g. Pokemon GO, Jurassic World game). Early on the idea emerged of cards representing pieces of DNA that alter the appearance of the character and this was the starting point to develop the theme. Unfortunately, due to time constraints the theme is not fully worked out and implemented in the user interface.

Doing a self-reflection

Build an animal character and make it an unique specimen by altering its DNA.

Fig. 38 Concept art



Searching for suitable internships

Send the animal character on an expedition to find the route that leads to the ideal place for it to live and work.

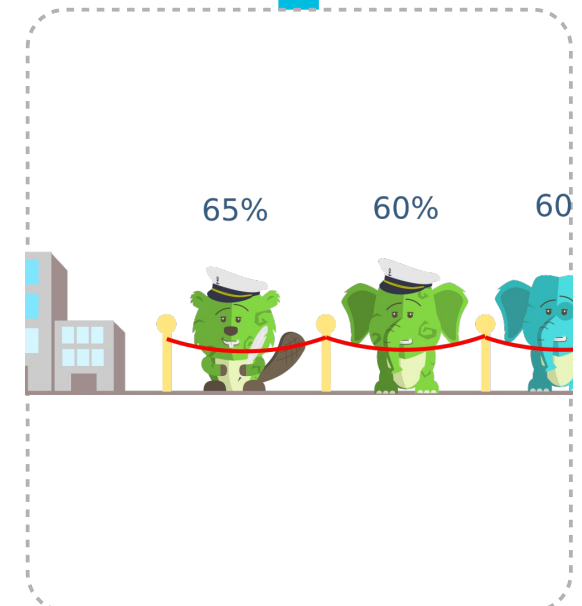
Fig. 39 Art by Pablo Olivera



Trying to get an invitation

On arrival there are more animals eager to get a place at a company and the players will try getting their animal at the front of the queue and after some time the doors open and only a few gain access.

Fig. 40 Gate



4.4 Card design

Students fill in cards they later on re-use to filter through the offers. The cards contain information that is very textual and presenting all of it constantly will make them unusable. You would not be able to quickly recognize the cards due to the length of the text and the size. The cards will therefore have two sides. The back of the card will be the full description and the other side will be a summary that is more visual and visible when not editing or viewing a specific card. See figure 41. The bullets on the bottom shows the amount of elements filled in on the card. A pictogram shows an item for your avatar and is used for easy recognition of the card. The keywords that are shown are used to summarize all the text.

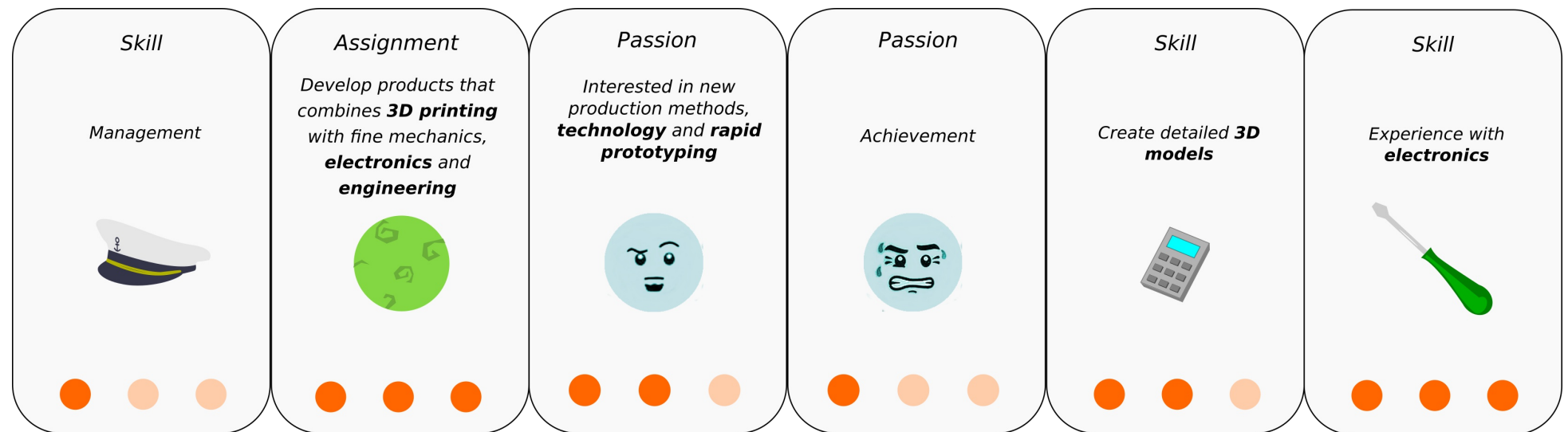
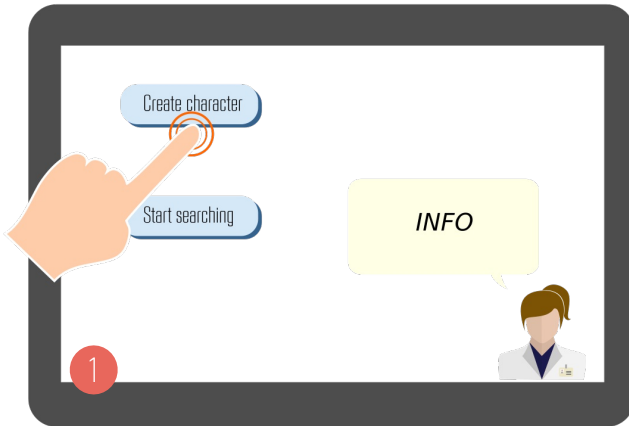


Fig. 41 Card examples

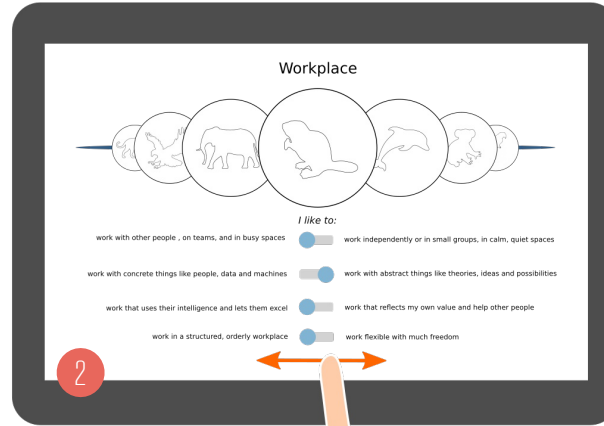
4.5 Main gameplay loop

By bringing all the covered topics from previous paragraphs together, it was possible to create a scenario that covers the complete game loop. All the steps that can be performed by the students are made visually with a screen and an indication of the type of interaction (fig. 42). A more in-depth rule book can be found in appendix F.

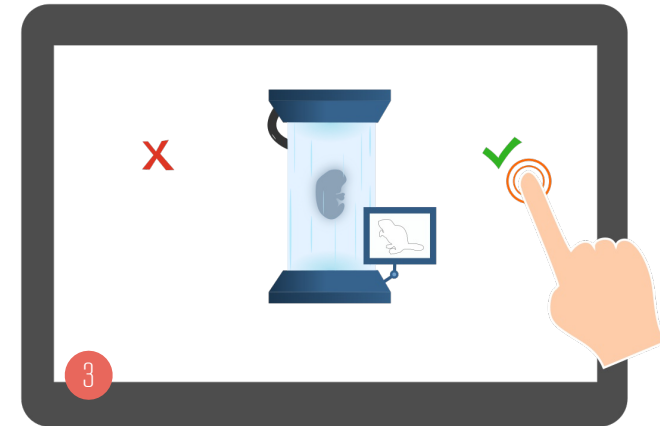
Fig. 42 Scenario



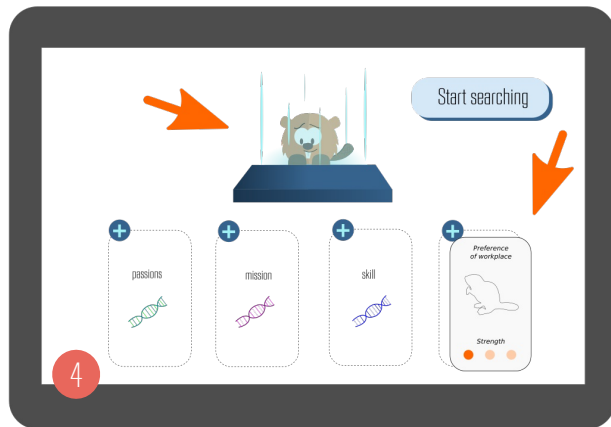
At the start screen of the application users will have two options, either creating/editing character or start searching. If the app is opened the first time, only the first option is available.



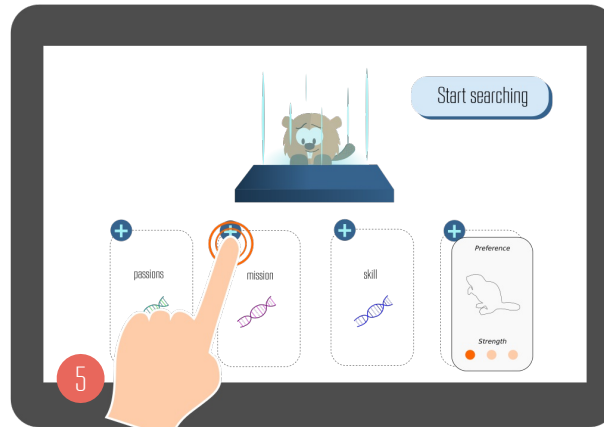
The character is their avatar throughout the game. Students will start defining their ideal workplace as part of the tutorial.



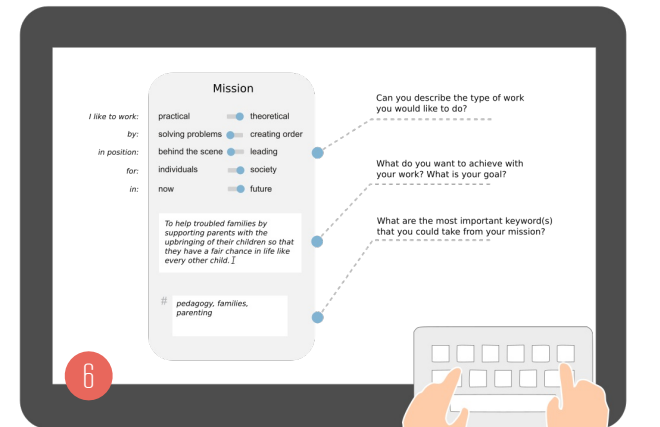
The result is an animal type that forms the basic shape of their character.



The first card is added to the character deck. Students can make many more cards for each of the four categories. All of them will have an influence on the visual appearance of their avatar at the top of the screen.



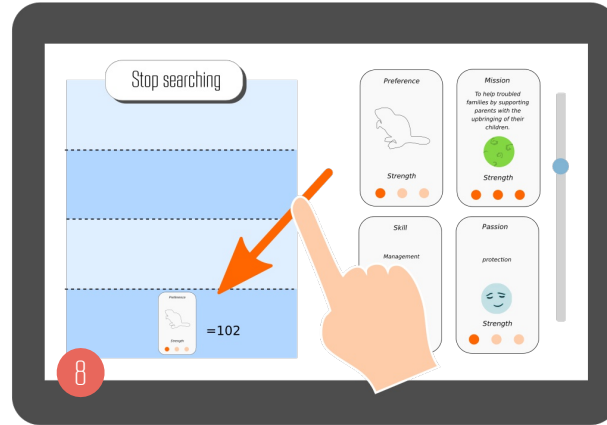
For example, students can add a personal mission card to their deck.



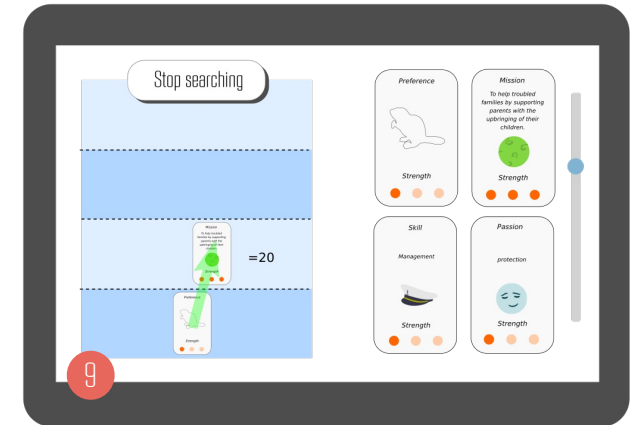
A mission card consists of several elements. The student can decide to fill in one or more, but doing all will result in the strongest card which will become important later on.



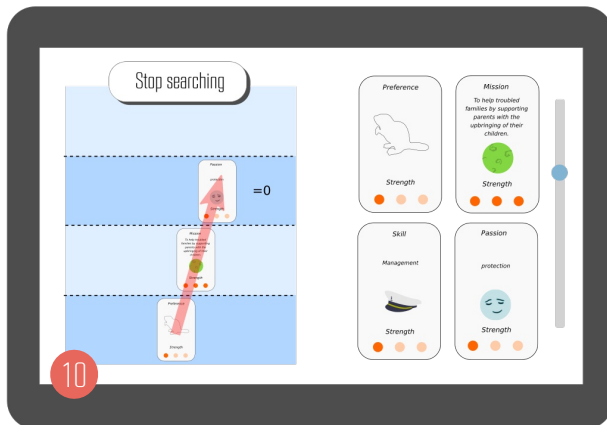
The bullets on the bottom of the card shows the card's strength and on the top the changed avatar. Over time the character deck will grow but in the meantime students can always start searching with their cards for offers.



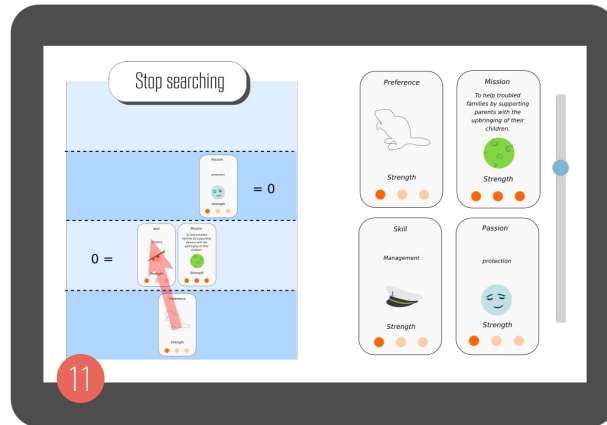
Students start laying down cards to make combinations and the app gives instant feedback for the amount of offers who included the same type of cards. In this example the student lays down the first card he or she considers the most important.



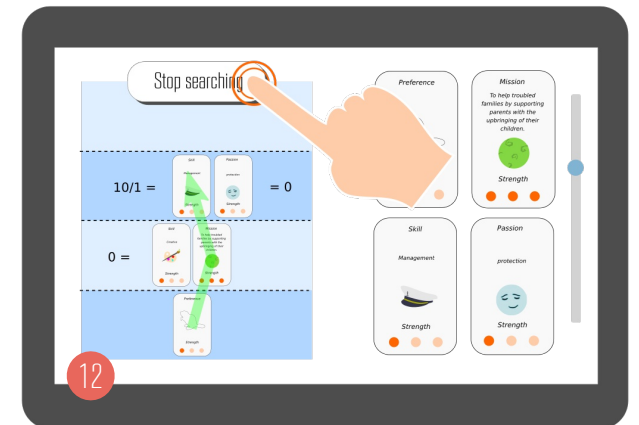
A student can now decide to stop searching and immediately look more closely at the results or continue by laying down another card on the next row. This will form the second combination.



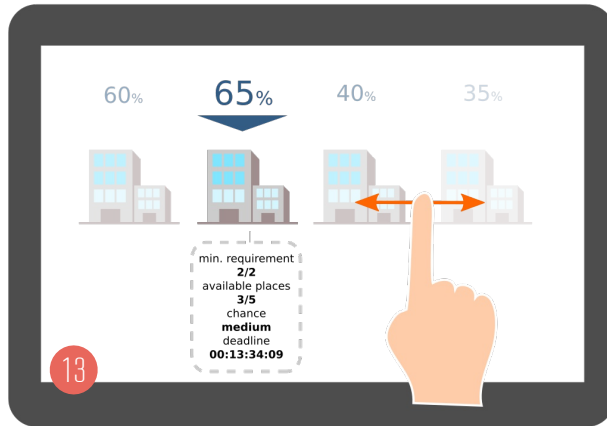
It may happen that a certain combination ends up with zero offers. Student can now decide to try another route. They will try combinations they did not consider at first because the cards someone laid down stay till the end of the game.



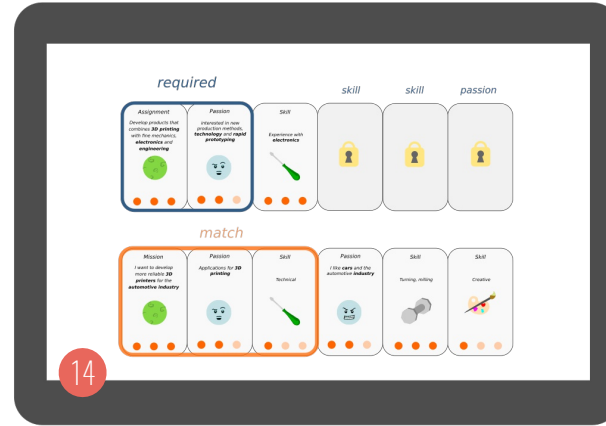
Students can continue as long as they want and stop to look at the results. It can also happen that all combinations resulted in a dead end and they have to start again from the beginning.



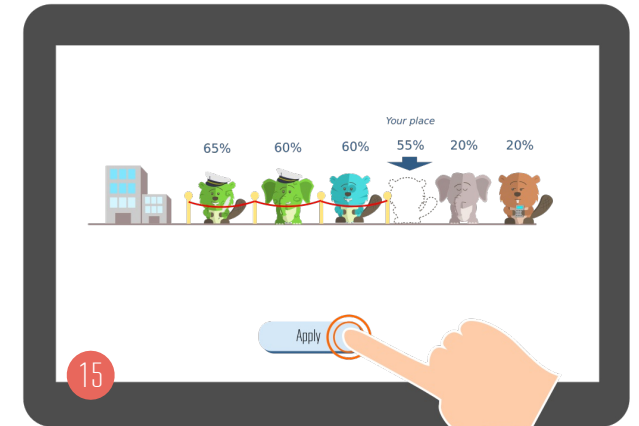
If students think that the ideal combination is found or that a reasonable amount of offers is left, they stop the filtering process.



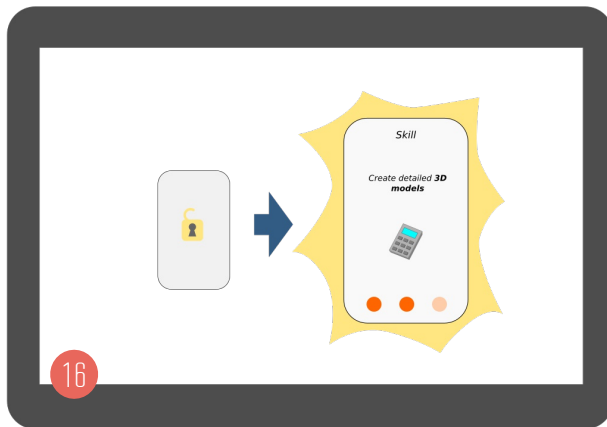
The offers are ranked on resemblance with the total character deck (a student may have more resemblance than only the combination). From the offer a maximum of 3 cards can be assigned as minimal requirements. Students see if they possess these requirements. Furthermore, students see how many places are available for an invitation and the deadline for the offer.



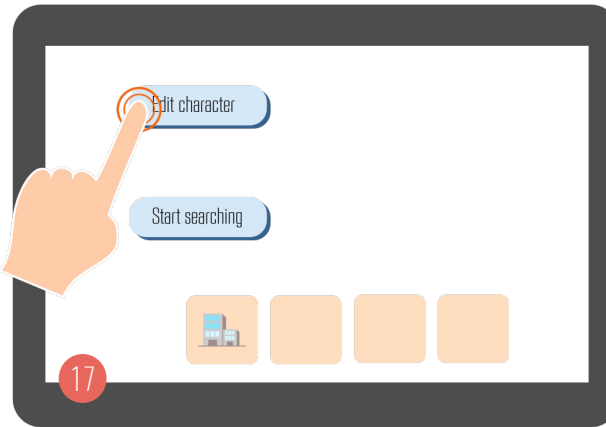
The deck created for the offer is shown to the student when they clicked on an offer in the previous screen. Only the required cards are face up, others are hidden with only the category shown. Your character deck is also laid down so that the student can compare the two rows.



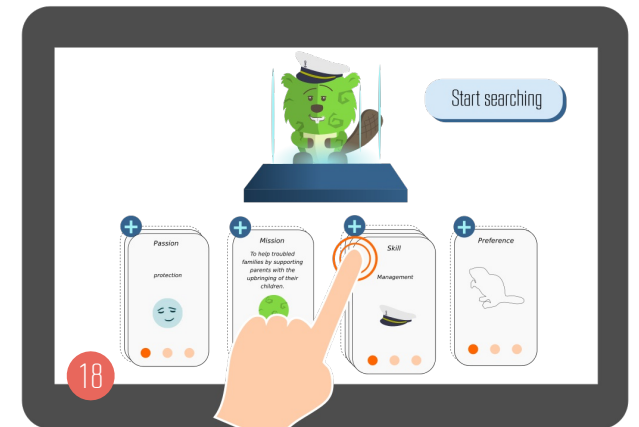
A queue is also visible with students who applied for the offer. You can see how much they match. If students apply for the offer they will also stand in the queue. The student's position is based on the match percentage. Based on the information from the offer deck and the queue students can make the decision to apply for the offer and this will place them in the queue.



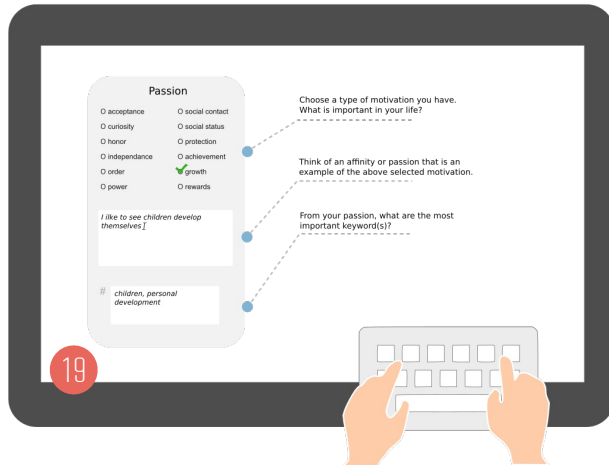
One of the hidden cards will be revealed of the offer deck when the student applies.



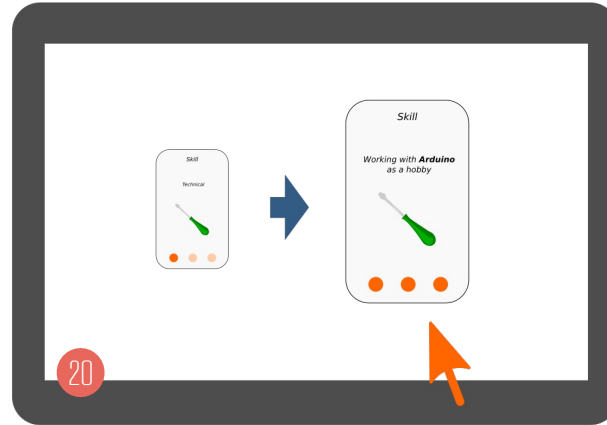
A student can apply for a maximum of four offers. He or she can unsubscribe but then the offer will no longer be available for the student. To improve your position in the queue a student can improve his or her character deck.



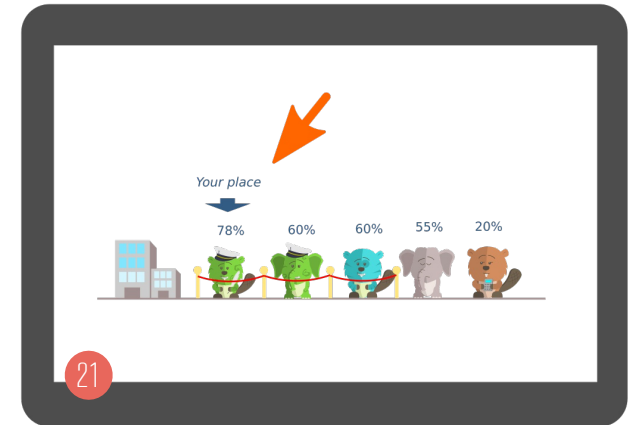
A student can decide to strengthen a card he or she already made earlier or add a new one to find out if it is one of the hidden cards of the offer you applied for.



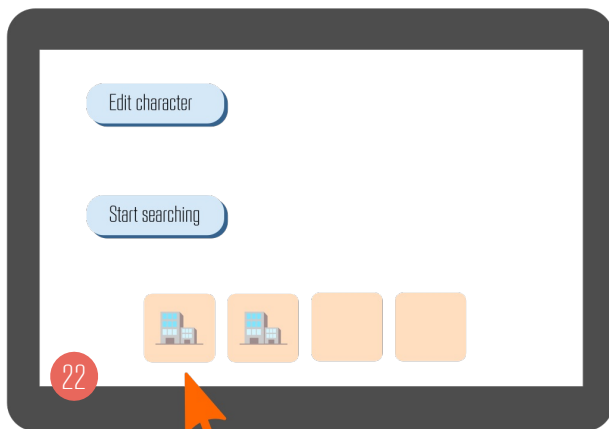
19 Students can always change the content of the cards they made earlier.



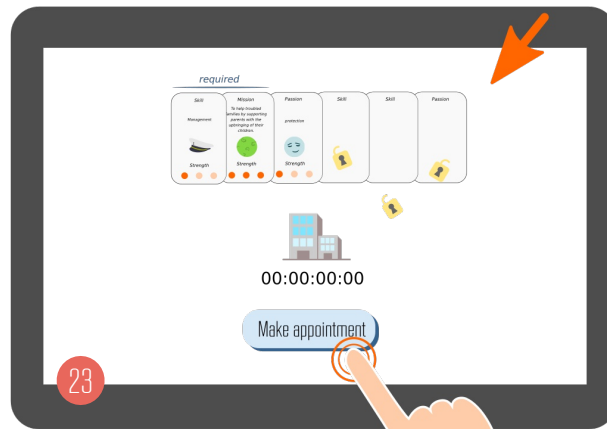
20 Students can strengthen their card by filling in more components of the card and thereby go deeper into the subject of the card. The card appearance will be changed afterwards.



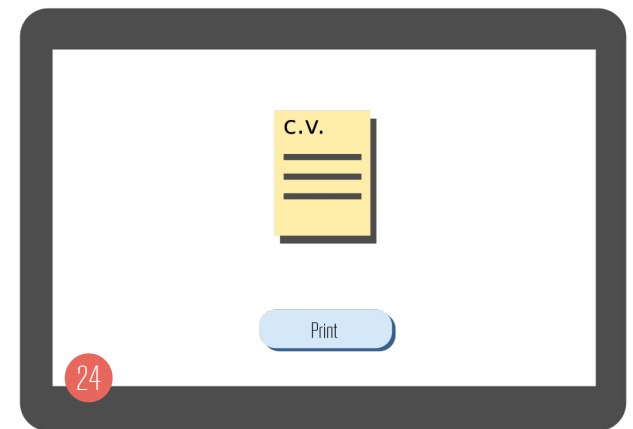
21 If another student has the same cards but your cards are stronger, you will stand before the other student in the queue.



22 In the main screen students see an overview of all the offers they applied for. The offers stay in the slots until the deadline expires. From that moment the student can contact the company to make an appointment.



23 The complete offer will be unlocked when the deadline expires so that the student knows all the information which makes it easier to decide if they want to make an appointment and to prepare for the internship.



24 Students can print out an overview of their character which will be their C.V. to bring to the internship application.

5. Evaluation

Many user tests have taken place right from the start until the finalized game. The reason to do it this way is that a serious game is all about motivating the users with interactions that take place between them and the game. By obtaining regular feedback, you will discover early on if a certain interaction works because this is something that is difficult to predict. You never know how the user will respond. If it turns out it does not work as intended, it is better to know that in an early stage of development. To make sure that this report is readable the decision was made to place these tests together in one chapter.

5.1 User testing character model

The character creation model is the result of several design iterations with in between two user testing sessions. The first session was a co-creation session in which participants created their character both visual and textual. The second was a more structured user test including paper instructions that is visually designed as an application including a theme and a survey afterwards.

Early version of the model

At the time of the first user testing session the character creation model did not have its final form. The model was more linear (fig. 43). Students first choose a possible self (Markus & Nurius, 1986). A possible self is an idea of what users are, what they might or like to become or what they fear to become. Players can pick one with whom they identify the most. The possible selves were created by combining the IKIGAI model with the 16 MBTI personality types. See

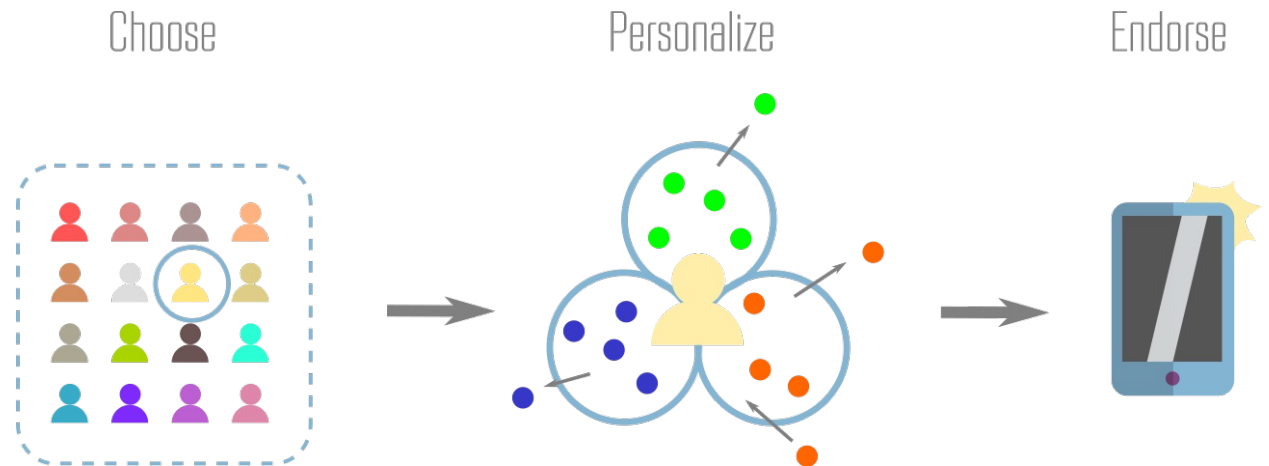


Fig. 43 Early concept for the character creation.

appendix B.

When a possible self was chosen the student had the option to alter it based on their liking. It is likely that not all the elements in the description are correct or that some are missing. The student could adjust the possible self as needed by creating new cards or deleting ones that did not have any resemblance.

Students were not matched with specific offers, but instead to company profiles. Company profiles were made entirely by the students because the characters from predecessors were attached to the profile and they evaluated the company culture. New students were matched with companies who had similar characters working for them in the past.

First session

The co-creation session took place at an evening with four university students from industrial design and one graduated mechanical engineer from the Haagse Hogeschool. The initial duration for the session was

planned for one hour, but it took an unexpected two hours to complete. The students were asked to fill in cards for the different areas of the character creation model and draw their avatar. Afterwards, the group evaluated the cards and gave suggestions for improvements on the design and the avatar creation.

Findings

The creation of the character with an avatar was considered fun by all the participants. However, the connection between the character creation and the rest of the concept was unclear because they did not understand how certain cards contributed in finding an internship. A scan of the characters can be found in appendix G.

There was a lot of information for the students to read and they were overwhelmed by it. It was suggested that users should be informed at the start of the application what the goal is of the application and why certain steps are taken.

Fig. 44 Characters created during the user test.

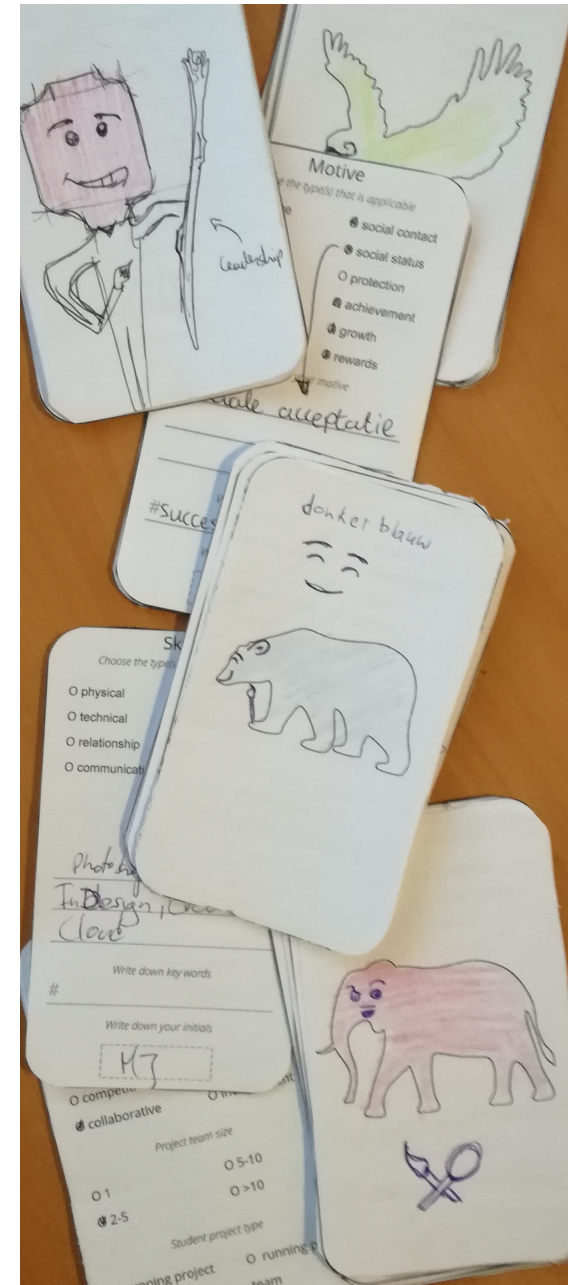




Fig. 45 Picture of the second user test.

The cards were considered a nice alternative to writing a reflection because it is fast and easy in use. However, certain terms on the cards were confusing because it was unclear if the self reflection was focused towards discovering what internship you would look for or if it was a more a general self-reflection. Reflection on the type of internship was considered more easy.

At the time of the session the cards were presented as a linear system were students started at the top and worked their way through until the last element. However, some students found the other way around easier, others were only able to fill in one of the elements. During a discussion between the students no clear decision could be made about the order of the questions on the cards.

Some students found it difficult to answer the questions with in particular those from the mission card and passion card. Due to time constrains some students were not able to write them down. In the final usage scenario, however, student

have more time to complete the questions and alter them over time. However, students suggested that more guidance is needed.

Second session

The second usertest took 45 minutes to complete with five industrial design students. This time they were asked to go through the concept using a paper instruction. The instructions were designed if it were screens from a tablet. The screens had a theme and provided the user with examples for the cards. The survey afterwards contained questions about the clearness of the concept, the amount of information that was provided for the matching results, the theme and if they would like to use it.

Findings

The coherency had improved because the goal of the application was clear for everyone. However, the first step where they choose a possible self was still vague. They did not know the benefit and choosing from 16 types was considered too much. A scan of the results can be found in appendix H.

Students also indicated they want to

know more about the company and their offer. Especially, what they do and what kind of student they are looking for. If a match was found with a company, students wanted to see how good they match.

A few students encountered some difficulty in distinguishing the passion and the mission card. A better term or explanation was required.

The theme was liked by the students, but for some students the appearance of the avatar was considered a little childish. Others liked it because it makes the whole reflection more fun. The suggestion was made to include another theme that has a more professional appearance. However, the theme would not stop users from using it.

Final iteration

Based on feedback from the coaches and the two sessions some big changes were applied to the concept with the character creation model as result. The possible selves were taken out of the process because it only made the character creation more complicated. The initial idea to include a possible self as a way to bypass self-reflection tests

did not work. Besides, the focus of the character creation model shifted more to the formulation of what will be the ideal internship and less about discovering who you are as a person. Therefore, a personality test is no longer needed just as the possible self. The shift in focus also led to the design of the offer creation model so that a better match can be made.

5.2 User testing offer model

The internship offer model is tested with two companies. A technology consultancy called Alten and a company developing serious games called &ranj. They were chosen because they both have a different approach in finding interns. Alten has very specific internships with clear assignments while &ranj does not have a clear assignment, but instead provide very open internship positions. &ranj write an assignment together with the student. The companies were asked to make an offer based on the model and to have a look at a scenario that covers the complete concept.

Findings

Both the companies thought positive about the concept. They liked the more personal approach because students generally overestimate their skills and therefore it is for the companies more important if the student shares the same vision and is well motivated to work for the company.

The companies were able to make a complete internship offer with exception of the more practical

aspects of the internship. For example, the amount of fee, the amount of hours, etc. They would prefer to include this in the offer description because they would not like to disappoint the student during the application. See appendix I for scans of the results.

The companies wished they were able to include a short explanation for the categories they selected on the cards. For example, they choose management as an important skill and they would like to write down

what this means in relation to the internship.

The companies liked to be able to include more than one offer in the system for different departments. Therefore, each deck should have a label with the type of department attached to it.

From the created decks they told that not every card is equally important. The companies suggested indicating a maximum of three cards that are considered the

minimum requirements and the remaining cards as additional.

Both companies told that it would be interesting for them to see what kind of students did their internship in the past. The company profile consisting of all the characters should therefore not only be visible for the students but also the company.

Alten was able to formulate a clear assignment description. &ranj, however, do not have a specific assignment beforehand and therefore would like to write down the company mission and vision instead so that students can decide if it matches their interests. Both options should be possible.

The concept is focused on letting students find the right internship. However, Alten wished they could look for students as well. For some of their internship positions it is difficult to find students because of a shortage.

Conclusion

The model to create an offer worked and the indication for a minimum requirements was implemented in the

concept and became an essential game mechanic.

The focus of the concept stayed thus far on the perspective of the student who is in need of an internship. However, it might be just as promising to look from the other way around. With little changes the companies could be able to search for students almost the exact same way. However, due to time constraints this will remain a recommendation to look at after the graduation project has ended.

5.3 User testing mechanics

The last test that was carried out near the end of the project had the purpose of testing the game mechanics that were implemented in the concept for flaws and checking the "fun" factor. The test was carried out by eight students from four different studies at the Inholland school in Delft.

Paper prototype

A paper prototype was made to simulate the concept. Due to the online aspect of the concept it was not possible to make a fully working digital prototype that can link both the company and the students. Instead, the process was simulated with pre-made search results and character deck. This was presented to the students and they were asked to play with it. The prototype was made in such a way that students were able to make decisions on their own instead of being guided through a scenario.

Therefore, it was possible to look at their behaviour more closely.

Results

The students liked the way of filtering through the companies with the help of game mechanics and the system worked as intended. However, all the steps were considered logical, but the pieces only fell into place near the end of the test.

Fig. 46 Picture taken during the user test of the game mechanics.



Students generally started with laying down the most broad card as a starting point and not the most specific one. This means they understand the concept of looking broad and then work your way to a more refined result. Students ended their search when there were around six companies left. Out of the six companies they did not pick the one who's deadline soon will expire. They explained that they would not choose a company without taking time to consider.

Some students suggested that they would like to be able to help each other out by endorsing cards from their fellow students in order to strengthen them.

Conclusion

The rate of success seems to depend on the way it is explained and presented to the user. Some students immediately understood the concept while others needed some extra explanation. Furthermore, the test was done while some parts of the theme was not fully worked out yet. A theme and certain metaphors can give meaning to the different steps and create coherency so that it is easier to

understand.



Fig. 47 Setup for the user testing of the game mechanics.

5.4 Fulfilment of the design brief

The design brief that was written down in the beginning of the project included the requirements the product needs to fulfill in order to satisfy both the company and the needs of the customers. How well the product meets these requirements is discussed in this paragraph. For some of the requirements it is unclear whether it fulfills a certain requirement or not because it has not been tested. This is due to the fact that the current prototype is not sufficient enough for a large scale test and should therefore be upscaled to a fully functioning one.

- ✓ **A. The product motivates students to take career preparations seriously during the complete period it is used.**
All the students who participated in one of the user tests declared that they would play the serious game knowing that it will help them finding an internship.
- ✓ **B. The product will be adaptable to the developments in the job market.**
Companies create internship offers for students this means the concept

will adapt automatically to the needs of the companies.

- ✓ **C. The product should offer result that can alter over time based on changing motives, skills and interests of the user.**
Students create cards for each skill, passion or mission. They can add as many as they like or change existing cards. Students decide with what cards they like to filter.
- **D. The product offers career guidance to help students in**

finding a suitable intern.

The aim of the serious game is to help students to find a suitable internship. However, there is no evidence that it will actually work because a large scale user test is not performed yet. The character creation model that is used for self-reflection works, however there is room for some improvement.

- ✓ **E. The product offers multiple suggestions for possible interns.**
Students decide how to filter and


decide how large the list of offers will be.

 **F. The product offers many feedback loops.**


During the creation of their character students can start searching for internships and with every new created card they open new possibilities. Every card they strengthen may influence the position in the queue for an internship offer.

 **G. The product will be applicable for every sector.**

The character/offer creation model is designed in such a way that every company and student is able to create a profile.


 **H. The product is independent from career counseling methods offered by schools.**

Students can play the game in their own time and environment because it will be a digital platform.

 **I. The product will be used until the end of the students**

study period.


Finding an internship is generally done at the end of their second year. This means that after they found an internship students will most likely stop using the serious game.

 **J. The product will not be used before the start of the second year.**


 **K. The product is intended for the Dutch student.**

 **L. If the product contains digital elements, it should be multi-platform .**

Wishes


 **1. The product makes use of gamification and/or serious gaming in order to motivate students to use the product and provide a playful and engaging user experience.**

Several game mechanics were implemented in the concept and all serve a certain purpose.


 **2. The product will offer a self-image that is matched with**

internship opportunities.


A model is created that can be used by students to reflect and by companies to make an offer.

 **3. The self-image is created by reflecting on meaningful experiences from daily life and the product helps users defining them.**

Students are asked to find examples for each card, but this is not the starting point of the card creation. Furthermore, they are not guided in finding these experiences.

 **5. The product is also used by students from university college**

No alterations are required to make it suitable for university college.

 **6. The product offers career opportunities for an internship, graduation project and first job.**

An offer for an internship is similar for a graduation project. Although not tested it may also be applicable for the creation of job offers. However, the game is targeted at students who need an internship.

6. Implementation

In this chapter an implementation strategy is discussed. The implementation strategy consists of two parts. The first part explains how the product should be launched and the second part explains a business model that addresses a long-term strategy.

6.1 Start-up strategy

Due to the fact that the serious game is in its core essence a platform it is essential that it should have a start-up strategy. After all, a new introduced platform can only survive if enough people are working with it within a short amount of time. After looking at competitors, the conclusion was made that the more prominent job vacancies websites have at least 1000 or more vacancies, this can be set as the first target. In this paragraph is discussed how this can be achieved.

Competition

In order to grow as a platform you have to compete with other platforms that deliver similar values to its users. Currently, there are many platforms/websites that place job and internship offers online. The most important competitors are placed on a graph in figure 48. The horizontal axe ranges from the more personal approach (values, mission) to the more practical approach (education, duration) as filters. The vertical axe ranges from a more

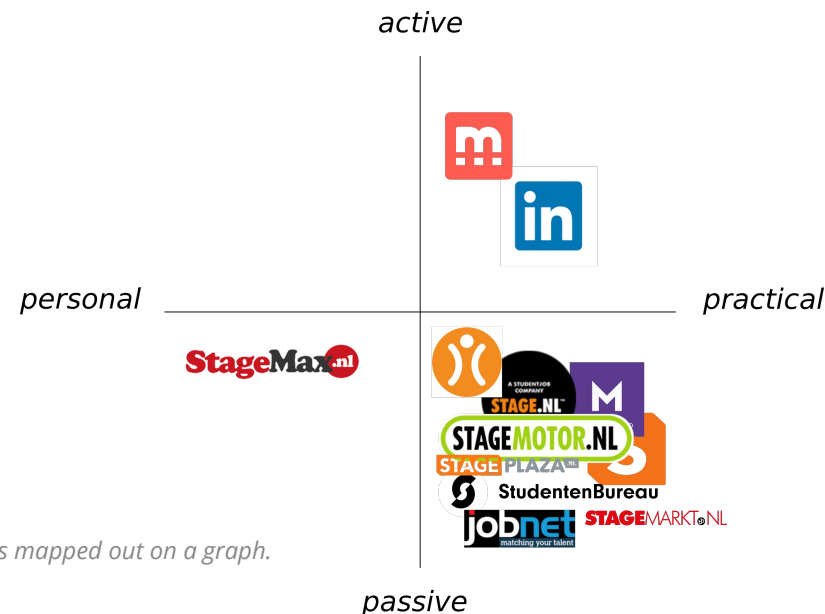


Fig. 48 Competitors mapped out on a graph.

passive approach from the platform to a more active approach in the match making process. Most of the competitors in the graph let their users scroll through long lists with only a very limited system to filter (only the practical aspects, like education type, fee, time) and do not help the user in finding a match. Although they do not deliver the same amount of depth and value as the created concept, they do have a large reach at this moment and dominate the current market.

Schools

The concept can enter the market successfully if it creates a more direct path to the students than competitors and this is possible through the schools of the students. The concept is targeted at students in need of internships and schools benefit if they are able to find one that suits them in the shortest time possible. This will reduce the delay that is now occurring and the negative attitude of students because of bad experiences with the help offered by the school.

Many schools have a network of

companies and they can be the first batch of companies to be working with the concept. The concept will then be offered to the students by the schools and this is an efficient way of advertising. In addition, the product delivers a system that allows students to reflect on their work, skills and values and this could easily fit in their current program that should prepare students for employment.

Besides the board of the school as stakeholder the teachers who are in direct contact with students can also play an important role. During an interview with a teacher at the Haagse hogeschool in Den Haag a problem came up that teachers know a lot of companies, but they were unable to match students with the company due to limited time or they found it difficult to find the right student. Teachers can play an important role in finding companies and introducing them to the product before it attracts companies independently from schools.

Students

As mentioned earlier students can help maintaining the system by asking the company (were they do

their internship) if they would like another student when they are finished. This can also be done for companies that have not worked with the product before and this can be made mandatory by the schools before they earn their study points.

Conclusion

During the development of the concept the schools were not actively involved in the process, but they are essential for the growth of the platform, especially during launch. The concept is finished far enough to be presented to schools and to discuss a possible launch/large scale pilot that would both benefits Yubu B.V. and the schools. Important benefits for the schools are as following:

- It is a nice addition to current programs for career guidance.
- It solves the problem of study delay if students know what they want and have found a place.
- The positive fiber it creates by students who successfully did an internship.
- It is less work for teachers if the system matches students.

6.2 Business model

So far much has been said about how it will benefit students, schools and companies. In this paragraph the business model is discussed so that it becomes clear how Yubu B.V. should create revenue out of the serious game.

The business model canvas

The business model canvas ("Strategyzer | Business Model Canvas", 2017) is used to map out the business possibilities for Yubu B.V.. The canvas is a commonly used model to create a strategy for businesses. It is presented as a poster with a few blocks that needs to be filled in to complete a business model. The blocks describe the value proposition, the infrastructure, customers and finances.

The model is easy to use, however its

rather a communication and design tool than a complete business plan. In this example it is used to sketch a possible business model. Before it can be turned in a real business plan, more information is needed of the competition and the investment possibilities of Yubu B.V..

<p>Key partners</p> <p>A host should maintain the servers which will allow the serious game to be permanently available and that stores all the data for students and companies.</p>	<p>Key activities</p> <p>The main activity for the companies and students is to play the serious game. Schools facilitate the game by directing both of them to the serious game. Yubu B.V. stays responsible for maintaining the serious game by providing regular updates to improve the game. This requires the gathering of feedback from customers on a regular basis. Lastly, Yubu B.V. should actively advertise the game after launch.</p>	<p>Value proposition</p> <p>Students get an invitation for an internship interview that fits with their interests and values so that they have a bigger chance to get selected and enjoy the time they work for a company.</p> <p>Schools are responsible for letting students graduate within a reasonable time and by using the product students do not suffer from delay. The product can be part of the career counseling program so less material must be prepared by the schools.</p> <p>The recruiting process will take less time for companies because they do not have to read every email and C.V. to choose a student for an application. Companies using the product will be the first to get in contact with students if the product is recommended by the school to use it.</p>
	<p>Key resources</p> <p>A budget is required for development and for paying the host. All the data that is required to play the game will be generated by the customers, therefore no other resources are required.</p>	
<p>Cost structure</p> <p>In an early stage the biggest expense will be the development costs needed to build the serious game while no revenue is gained yet. If the product will be turned into a career preparation method for schools it is essential that during the development period it is already essential to contact schools, get them involved in the development process so that they later on turn into paying customers. Cost will be made to visit and call schools. When the product is launched more money will be spent on marketing. Costs for maintaining servers will be there from the beginning.</p>		

Customer relationships

A long-term relationship should be maintained with both companies and schools, so that platform grows and more revenue can be obtained.

This will not be a difficult task as long as the platform proves itself to be efficient and there is a large enough flow of new students and companies.

The relation with students is rather short. After the completion of their study, they do not need the platform any longer. It is important they end its usage period with a positive experience because they can still recommend it to others.

Customer segments

Students and companies are the most important users because the serious game involves bringing these two groups together. The school will have an important role in the beginning as it can boost the usage of the game during its launch period by introducing it to them. There are 446000 HBO students at this moment ("Vereniging Hogescholen", 2017). A large part already completed their internship. A study will take 4 years to complete and the largest group are first year students. This means that at least 100000 students will need to find an internship yearly. There are 37 HBO schools (many have more locations) who could potentially use the product.

Channels

The serious game is an online platform that will be accessible through digital devices like tablets, PC's and smartphones. The game will create all the connections between the different stakeholders once they are using it. Therefore, it is important to bring its existence under their attention and to convince them to use it. A good way to reach students and companies in an early stage is through the schools. This means that schools should be convinced they need the serious game for their students. Visiting and calling schools is the best way to get their attention. In a later stage it is possible to just reach enough customers through web advertisements.

Revenue streams

Revenue can be gained by charging companies for every offer they would like to add to the game (one of the cheaper job vacancy websites charge around 200 euro for 60 days). An advice will be to avoid charging students because they are the customers with the least amount of money and because there are free alternatives it can be a drawback to use the game. A more continues stream of revenue can be gained from schools. The game can be part of a career counseling program or may be turned into a complete program and therefore a license based model can be applied. Due to the fact that there are not that many HBO institutions in the Netherlands it is important that each location should buy a license seperate for the complete school or individual students (the last one is the current model used by Yubu B.V.).

7. Recommendations

The report ends with this last chapter in which further recommendations are given to Yubu B.V.. It includes aspects of the concept that needs further attention in terms of design and testing. Furthermore, a few steps are recommended that needs to be taken for further development of the concept.

Design improvements

Users found it difficult to make some of the cards, especially the passion cards. Although they had less time available than in a real user context it can help to guide them more in the making process. It is possible to use more gamification techniques in the form of mini-games for the elements on the card and to make use of more visuals. For example, they could be asked to swipe through a few images representing the motivation types similar to the mechanic of

Tinder and by doing so select the motivation type that fits best (fig.49).

Another change that should be applied is the use of more scales and sliders for the cards in the category of the company preferences. The students wished they could be more specific by having more options available to them.

The avatar design was not always favoured by every student.

Therefore, a suggestion would be to make an additional theme as an alternative for students to choose or to redesign them completely. The link between the steps should be improved by giving more thoughts on the theme. The purpose of the theme in combination with metaphors is to give meaning to the steps even if the underlying purpose is not known to the students.

Some metaphors are already mentioned, like the route, the

queue and the DNA alterations. But more coherency should be created between these metaphors to make it a complete theme that can easily be understood by the students. The metaphors should not be explicitly mentioned, but instead it should be made visually to create a better picture and to make it more lively.

Testing

Some elements of the concept in its current state are not fully tested. The concept is not tested with both the companies and the students at the same time and students have not been searching for companies with their own created character deck. It is advised to test both these aspects before the development of a digital prototype with for example companies who already have internships at their office. If the concept works well they should find a match based on their cards.

Feedback is asked about the theme during the many tests, but is not evaluated by the students in the form of a survey because it was not fully worked out. This should be done when all the user interfaces are designed



What type of motivation is applicable?

- acceptance
- curiosity
- honor
- independence
- order
- power
- social contact
- social status
- protection
- achievement
- growth
- rewards



Fig. 49 Images to explain the terms on a player card

with the theme.

Further development

A larger pilot test should be done to test the efficiency of the serious game. A digital prototype is required to make the test feasible on a larger scale. This also requires that the UI/UX is worked out for every step the students are confronted with. It is then possible to assess the concept on the transfer effect as determined at the beginning of the project.

The social aspect of the game slowly turned to the background during the development of the concept. However, students would like to have the ability to make social contact with others. They came with the idea that students can help each other with making the character card. They would like to be able to make endorsements similar to what is possible with LinkedIn.

After the development of the serious game is completed and it is fully functioning, Yubu B.V. can consider to expend it even further to gain more revenue. Students already perform a self-reflection and create a C.V. with the serious game. Therefore it can be

turned in a complete career guidance program that can be sold to schools.

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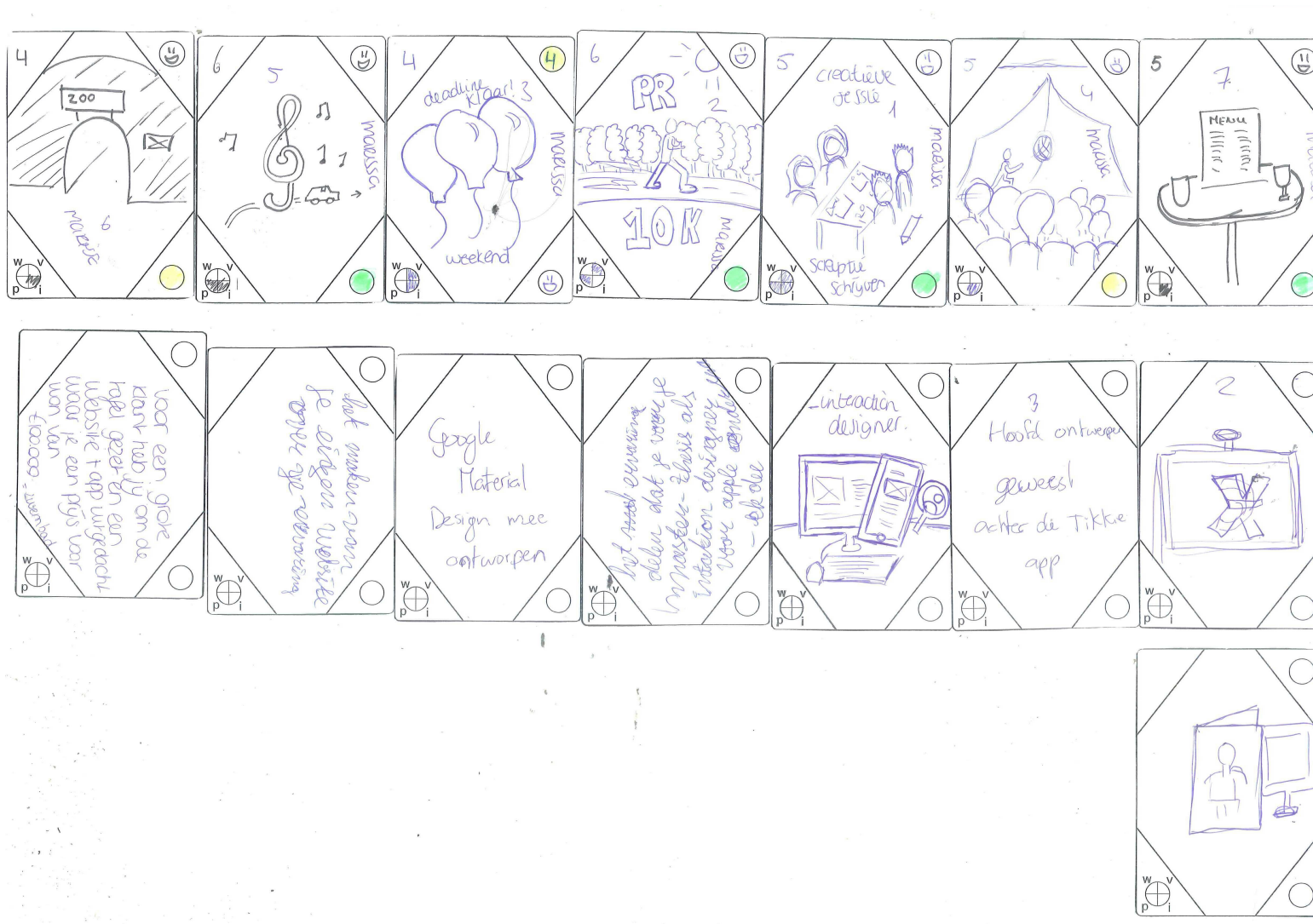
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Appendix A: Contact mapping cards



Appendix B: IKIGAI + MBTI types



Practical and fact-minded individuals, whose reliability cannot be doubted



Very dedicated and warm protectors, always ready to defend their loved ones



Quiet and mystical, yet very inspiring and tireless idealists



Poetic, kind and altruistic people, eager to help a good cause



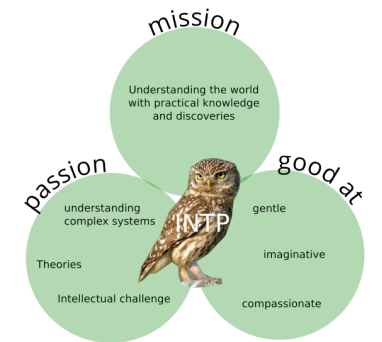
Imaginative and strategic thinkers, with a plan for everything



Bold and practical experimenters, masters of all kinds of tools



Flexible and charming artists, always ready to explore and experience something new.



Innovative inventors, with an insatiable thirst for knowledge.



Smart, energetic and very perceptive people, who truly enjoy living on the edge



Spontaneous, energetic and enthusiastic people -life is never boring around them.



Enthusiastic, creative and sociable free spirits, who can always find a reason to smile



Smart and curious thinkers, who cannot resist an intellectual challenge



Excellent administrators, unsurpassed at managing things -or people



Extraordinary caring, social and popular people, always eager to help.



Charismatic and inspiring leaders, able to mesmerize their listeners



Bold, imaginative and strong-willed leaders, always finding a way - or making one

Appendix C: Character examples

Student profile example

Beaver		
<i>Practical and fact-minded individuals, whose reliability cannot be doubted</i>		
Mission		
Type:	Sentence:	Tag:
Practical	Save the planet by building efficient power plants that provide green energy	# Save planet
Creating order		# Green energy
Behind the scene		# Power plants
Society		
Now		
Passion		
Type:	Sentence:	Tag:
Achievement	I like to create energy from seawater because it has much potential	# Seawater
Power	I like to work on building large structures	# Power plants # Large machinery
Growth	I think it is important to always optimize your system	# Optimizing
Skill		
Type:	Sentence:	Tag:
Technical	I successfully build many test setups	# test setup # engineering
Analytic	I am experienced in creating calculation models to optimize structures	# Matlab
Management	I always finish my job in time by managing time efficient	# time management

Student profile example

Elephant		
<i>Extraordinary caring, social and popular people, always eager to help</i>		
Mission		
Type:	Sentence:	Tag:
Practical	To help troubled families by supporting parents with the upbringing of their children	# Pedagogy
Creating order		# Parenting
Leading		
Individual		
Now		
Passion		
Type:	Sentence:	Tag:
Protection	Giving children a nice childhood	# Childhood
Social contact	I like to work with families and solve family problems	# Solve family problems
Growth	I like to see children develop themselves	# Personal development
Skill		
Type:	Sentence:	Tag:
Management	I am good at organizing people's life	# Scheduling
Relationships	Children trust me very quick	# Work with children
People skill	Good at leading and teaching children	# Leading # Teaching

Appendix D: Offer examples

Assignment example

Beaver		
<i>Practical and fact-minded individuals, whose reliability cannot be doubted</i>		
Mission		
Type:	Sentence:	Tag:
Practical	The development of products related to 3D printing where different disciplines come together: fine mechanics, electronics, value engineering and control technology.	# Product development
Creating order		# Embedded
Behind the scene		# 3D printing
Society		
Now		
Passion		
Type:	Sentence:	Tag:
Curiosity	New production methods	# Rapid prototyping
Achievement	perseverance	# Perseverance
Skill		
Type:	Sentence:	Tag:
Technical	Affinity with electronics	# Electronics
Analytic	High detailed 3D models	# 3D CAD
Management	Project planning	# Project planning
Company		

<https://www.nationalevacaturebank.nl/vacature/19423110/afstudeer-stage-werktuigbouwkunde>

Assignment example

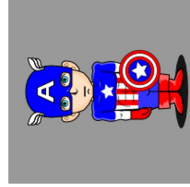
Elephant		
<i>Extraordinary caring, social and popular people, always eager to help</i>		
Mission		
Type:	Sentence:	Tag:
Practical	You will follow an internship at a foundation on Curacao that provides support to disadvantaged young people. The foundation does this with the help of therapy, art, social skills and sports activities.	# young people
Creating order		# Curacao
Leading		# Development aid
Individual		
Now		
Passion		
Type:	Sentence:	Tag:
Social contact	Energy from working with people	# Helping people
Curiosity	Learn new cultures	# Abroad
Skill		
Type:	Sentence:	Tag:
Managing	Work independent	# independent
Communicating	Teach people	# teaching
People skill	Nice and trustworthy	# trustworthy

<https://www.nationalevacaturebank.nl/vacature/19374540/stage-curacao-veelzijdige-zorgstage-bij-stichting-die-hulp-biedt-aan-jongeren>

Appendix E: Avatar types



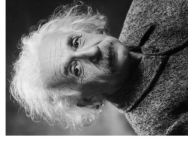
Business



superhero



video game character



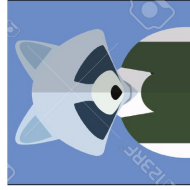
historical figure



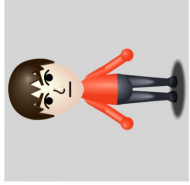
random generated



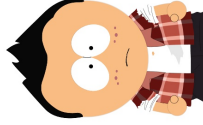
artistic



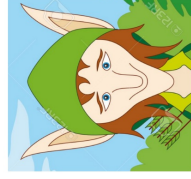
animal



3d model



cartoon



fantasy



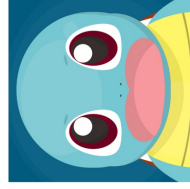
physical



gods



abstract



creatures



funny



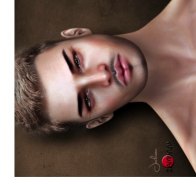
younger me



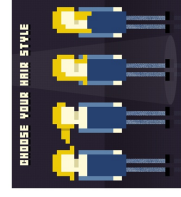
anonymous



film character



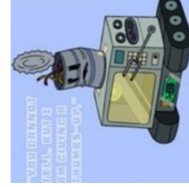
realistic



pixelated



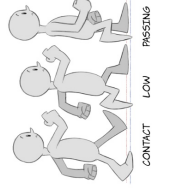
story character



non living objects



real life person



animated



complete body

Appendix F: Rule book

Why do I need this application?

The application will help you in your search for an internship. You are asked to perform some steps and if you give it your best shot you will end up with an invitation for an internship interview.

Who is using it?

Students are using it to find an internship and companies use it to place their offers online.

How does it work?

You will create a character deck. A character deck consists of cards you will need to filter through the offers. The more cards you create the more broader you can search. When you found a company you can add yourself to the queue and you can earn your invitation by improving your deck so that the matching percentage increases and you beat the competition.

1. Build your character deck

There are four types of cards to create: passion, skill, mission, internship preferences.

You can add as many cards as you like.

Each card consists of a few

elements and you are asked to fill in one or more elements in any order you like (fig.50).

The cards you created changes the appearance of your character, if you have more cards in one category you can decide which card influence

Mission

I like to work: practical / ~~theoretical~~

by: ~~solving problems~~ / creating order

in position: ~~behind the scene~~ / leading

for: individuals / ~~society~~

in: now / ~~future~~

To help troubled families by supporting parents with the upbringing of their children so that they have a fair chance in life like every other child. I

pedagogy, families, parenting

Can you describe your mission or goal in life with the following dichotomies?

Write down your personal mission/ goal in life?

What are the most important keyword(s) you could take from your mission?

Fig. 50 Example player card

the appearance of your character.

2. Make card combinations to filter through the offers

You lay down a card you find important on the first row (fig. 51).

The number that appears shows the amount of offers with the same card. You can decide to lay down a new card on the next row to form a combination or you can stop and watch your results in more detail. Laying down cards will result in a more refined outcome, but

the amount of offers will be less.

Once a card is laid down it stays there until the end of the game.

The new card together with the previous card form a set that leads to a different list of offers.

The previous number will expire.

If the card combination results in 0 offers, you can try another route by laying down another card in a different direction to form a new combination. If every route resulted in an outcome of 0 the game ends and you can start

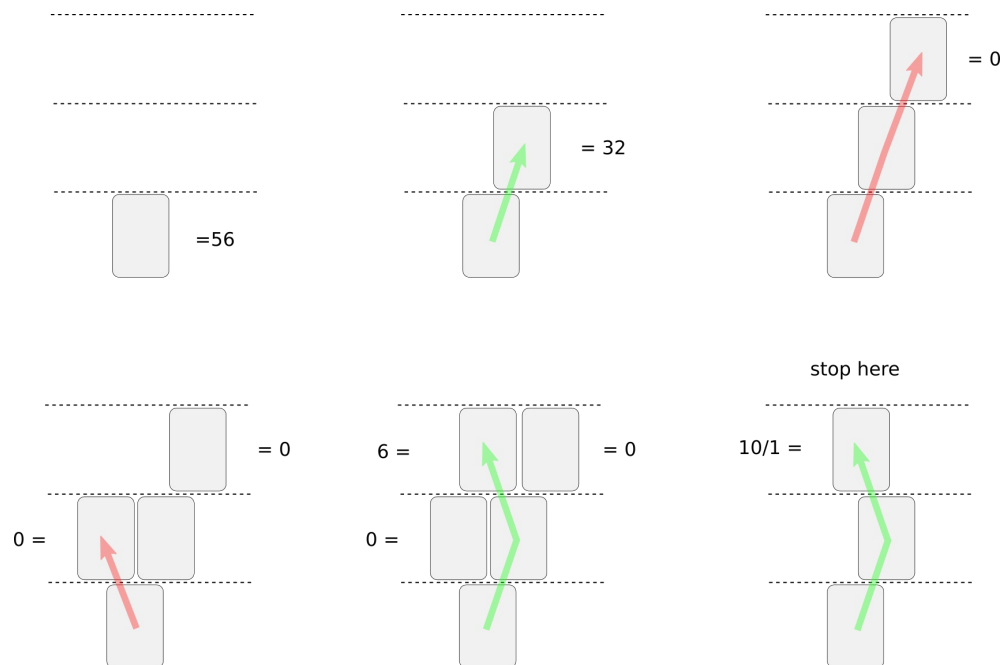



Fig. 51 Mini-game explanation

Fig. 51 Example of a match

78%



min. requirement
1/1
available places
2/30
chance:
high
deadline
00:00:06:28

again.

3. Results

If you stop your search, a list of offers will be shown with some additional information (fig. 51).

Above each offer a percentage is shown that indicates your resemblance.

An offer also consists of a set of cards and the company indicated which of them are the minimum requirements, this can be up to three cards. You see how much of them you already possess before showing the complete set of cards.

Furthermore, you see how many invitations are available and how many students have applied, the chance of success and the enrolment deadline. You can see some more detailed information about the offer by clicking

on one of them.

4. Offer information

In this screen you see the set of cards that represent the offer (fig. 52).

The cards that are part of the minimum requirements lay face up and are fully visible.

In addition you see the other cards face up that you also possess in your character deck (so not only the

combination you have used to search). The other cards are face down but you will be able to see which category they are.

You also see the queue with students (including their matching percentage) that have applied for the offer and you see where you would stand if you would apply as well.

It is up to you to decide if you want to apply for the offer or you can decline

and look further.

5. Apply:

You can apply for a maximum of four offers.

When you apply for an offer an additional face down card of your choice will be flipped.

If you apply you will stand in the queue and it is up to you to try to get higher in the ranking by improving your deck so that the matching percentage will increase.

You have a few options.

You can create all the cards matching with the minimum requirements.

You can try to create new cards hoping that it will unlock the face down cards of the offer.

You can also strengthen the cards that already matched if you haven't done that yet (filling in the other elements on the card)

Lastly, if too many people have the exact same matching percentage, the person who applied first will get it.

You can always step out of the line, but you will no longer be able to apply for the same offer again.

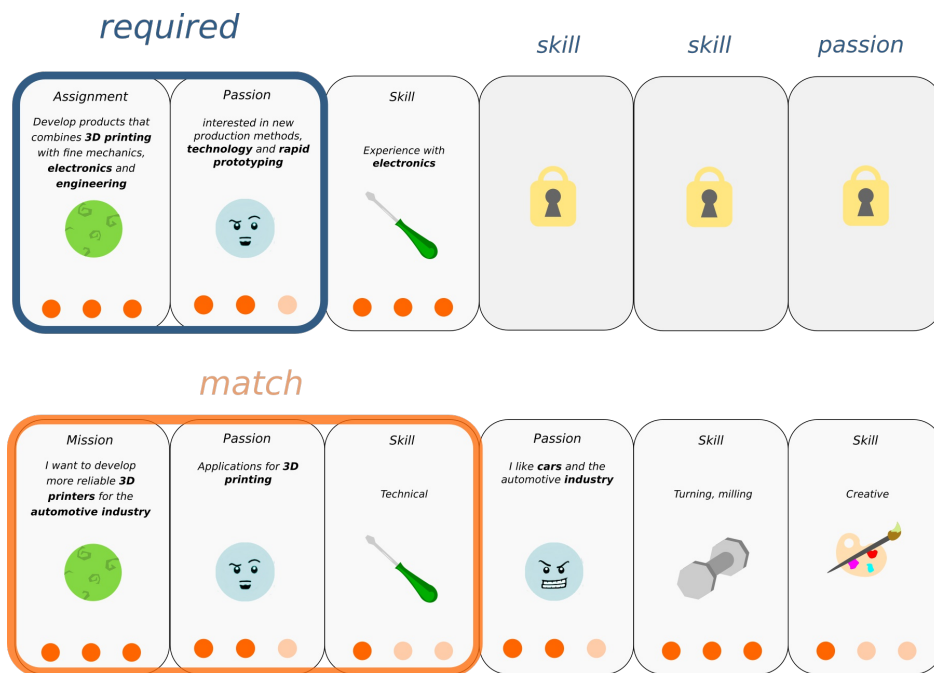


Fig. 52 Matching of the offer and the character deck

The calculation of the percentage (fig. 53):

The minimum requirement cards determine 60% of the total sum. Additional cards make up for the remaining 40%.

Each card consists of three elements. If

you have filled in one element on the card and the matching card of the offer has filled in all of them, the match will only be 1/3.

Below you see some examples:

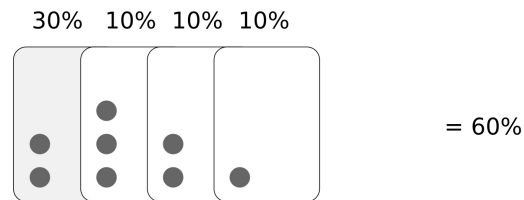
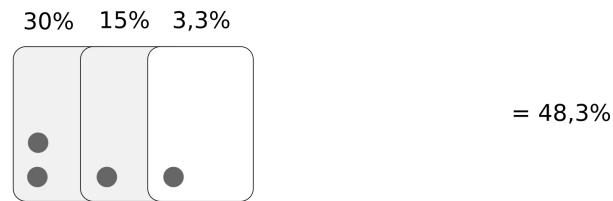
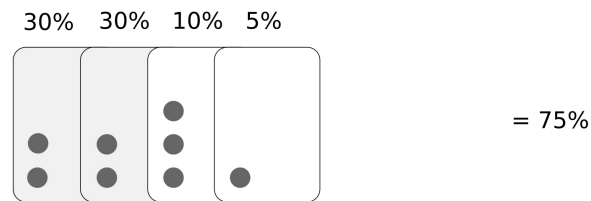
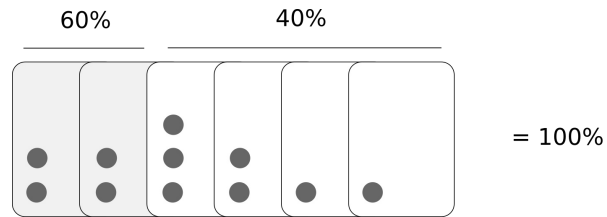


Fig. 53 calculating percentages

6: Invitation:

After the deadline expires you will be informed about the end result.

If you have managed to obtain an invitation you can send an email to make an appointment.

In addition, all the cards from the offer will be unlocked.

You can now prepare for the internship interview.

If it turns out that you have bluffed your way into the company, it is likely the company will notice it. If this is the case the company can inform the system and you will get a penalty. Normally you can apply for four offers, but then only two slots are available for a month (fig. 54).



Fig. 54 calculating percentages

Appendix G: Scan first user test

Motive / are
Choose the type(s) that is applicable

acceptance social contact

curiosity social status

honor protection

independence achievement

order growth

power rewards

Write down your motive

To appreciate nature
To invest in relations
To learn

Write down key words

Friends and

Write down your initials

Mission
Line through that is not applicable

practical / theoretical

solving problems / ~~creating order~~

now / future

behind the scene / leading

individual / society

Write down your mission

Clear the world
with magic

Write down key words

wonder, detail

Write down your initials

MW

Motive / are
Choose the type(s) that is applicable

physical creative

technical analytic

relationship management

communication personal skill

Write down your skill

Listening to others
Creating visuals
Having fun

Write down key words

affective

Write down your initials

Company

Work structure

hierarchical circular

matrix organic

Atmosphere

competitive controlled

collaborative independent

Project team size

0-1 0.5-10

2-5 >10

Student project type

running project individual

new project, individual

running project, team

new project, team

Coaching

none once a week

every month every day

Rules

strict working hours flexible working hours

Facilities

own workplace social activities

fee lunch

Company name

Write down your initials

MW

Coaching

none once a week

every month every day

Rules

strict working hours flexible working hours

Facilities

own workplace social activities

fee lunch

Company name

Write down your initials

MW

Appendix H: Scan second user test

~~ENFJ~~ **ENTJ**

I like to: meet new people and take action (E) - reflect on my thoughts and ideas (I)

I trust the: abstract and love to generalize a pattern (N)

tangible and love the specific detail (S)

I make decisions: by getting a feel for the situation and looking for consensus (F)

through detached, rational and logical thoughts (T)

I prefer to: keep decisions open (P)

have matters settled (J)

Passion	Mission	Skill
<p>Choose the type(s) that is applicable</p> <p><input type="checkbox"/> acceptance <input checked="" type="checkbox"/> social contact</p> <p><input checked="" type="checkbox"/> curiosity <input type="checkbox"/> social status</p> <p><input type="checkbox"/> honor <input type="checkbox"/> protection</p> <p><input type="checkbox"/> independence <input checked="" type="checkbox"/> achievement</p> <p><input type="checkbox"/> order <input checked="" type="checkbox"/> growth</p> <p><input type="checkbox"/> power <input type="checkbox"/> rewards</p> <p>Write down your passion</p> <p>I like to create new stuff things, and improve myself. meet people</p> <p>Write down key words</p> <p># Create. # improve</p> <p>Write down your initials</p> <p>C.T.</p>	<p>Line through that is not applicable</p> <p>practical / theoretical</p> <p>solving problems / creating order</p> <p>now / future</p> <p>behind the scene / leading</p> <p>individual / society</p> <p>Write down your mission</p> <p>Make the world better through design</p> <p>Write down key words</p> <p># Better # Design.</p> <p>Write down your initials</p> <p>C.T.</p>	<p>Choose the type(s) that is applicable</p> <p><input type="checkbox"/> physical <input checked="" type="checkbox"/> creative</p> <p><input type="checkbox"/> technical <input checked="" type="checkbox"/> analytic</p> <p><input type="checkbox"/> relationship <input type="checkbox"/> management</p> <p><input type="checkbox"/> communication <input type="checkbox"/> people skill</p> <p>Write down your skill</p> <p>I can think creatively and logically</p> <p>Write down key words</p> <p># Creative # logical</p> <p>Write down your initials</p> <p>C.T.</p>

Skill	Passion	Passion
Choose the required soft skill <input type="radio"/> physical <input type="radio"/> technical <input type="radio"/> relationship <input checked="" type="radio"/> communication <input checked="" type="radio"/> creative <input type="radio"/> analytic <input type="radio"/> management <input type="radio"/> people skill Write down the required hard skill programming skills	Choose the required motivation <input type="radio"/> acceptance <input checked="" type="radio"/> curiosity <input type="radio"/> honor <input type="radio"/> independence <input type="radio"/> order <input type="radio"/> power <input type="radio"/> social contact <input type="radio"/> social status <input type="radio"/> protection <input checked="" type="radio"/> achievement <input type="radio"/> growth <input type="radio"/> rewards Write down the required affinity technology (high-tech) → high-tech	Choose the required motivation <input type="radio"/> acceptance <input type="radio"/> curiosity <input type="radio"/> honor <input type="radio"/> independence <input type="radio"/> order <input type="radio"/> power <input type="radio"/> social contact <input type="radio"/> social status <input type="radio"/> protection <input checked="" type="radio"/> achievement <input type="radio"/> growth <input type="radio"/> rewards Write down the required affinity high-tech
Write down key words programming Write down your initials	Write down key words software, offshore, application, software Write down your initials	Write down key words Arduino, Raspberry Pi Write down your initials

For how long will the offer stay in the system?

● 1 day

● 28 days

● ∞ (half year)

How many students can apply?

● 1

● 10

● 10