

A novel platform for sharing and renting clothing to reduce environmental pollution

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Abstract—In today's rapidly developing, technology driven world, the environment is being polluted in numerous ways, significantly more than in the past. Considering the fact that the fashion industry is the second largest polluter worldwide, it is evident that changes are needed in the way clothing is viewed and used.

In this paper, we present a possible solution to this problem, which is built using the constantly advancing concept of shared economy. The platform we present is intended to create an online space that is used to share clothes that are not considered useful by their owners. Furthermore, the rental of expensive clothing for special occasions is provided.

Adhering to the importance of the business aspect of any novelty being introduced, a market research was also conducted in our country. This paper includes these results, together with the conclusions drawn and the possible improvements suggested.

Index Terms—Sharing economy platform, Sharing economy, Fashion, Pollution

I. INTRODUCTION

Inexpensive fashionable clothing is widely available today, which is the impetus to change in the way items of clothing are viewed, making them disposable.

This means that garment consumption has been made more democratic, however not without negative consequences. The environment is being polluted in the process of growing water-intensive cotton, by the release of dyes into local water sources and by the millions of tons of textile waste in landfills [1].

Considering the threat posed by pollution globally, efforts to develop a sustainable solution are made perpetually.

Research on how to increase corporate social responsibility is currently being done [2], in hopes of introducing change into the production of clothing.

Other solutions can possibly be found by looking into the idea of clothing reusability. The concept of sharing is not new, which is one of the reasons sharing economy is successful [3]. Taking into consideration the changes brought by sharing economy, it can be used as an integral part of such a solution. In this paper we present a sharing economy platform that supports clothing reusability, together with market research to assess the possibility of its successful implementation in our country.

The structure of our paper is as follows. Section II details the market research that was conducted. Section III describes the business and technical aspect of our solution. Finally, section IV presents our conclusions.

II. MARKET RESEARCH

In this paper, we present a possible improvement regarding the pollution caused by the fashion industry.

Following the definition of the idea of a software solution that uses the concept of shared economy, an analysis of the global market was conducted. The analysis showed that several globally successful businesses have evolved from a similar idea. The most prominent are "Rent the Runway" in USA, "Girl Meets Dress" in UK, "Chic-by-choice" in EU and "Glam Corner" in Australia.

Considering these findings, the next logical step was to conduct a local research in our country.

A. General research

The initial research consisted of a survey which had a purpose of evaluating the consumption of digital content and inclination to share and/or rent clothing online. 360 people were reached by this survey in a period of four months at the end of 2019. The results were carefully analysed.

Firstly, the demographics of the sample was studied. The vast majority of the population are within the age range of 18 to 40 years old. Moreover, 73.5% of them are female. Taking into consideration the nature of the solution being presented, these demographics were expected.

Secondly, the consumption of digital content was examined. This was done by asking questions about the daily internet usage as well as the usage of some prominent e-commerce platforms. More than 79% of the population are active internet users and about 21% of them have used at least one e-commerce platform, as shown in Fig.1.

This statistics is a key indicator that the reach of e-commerce is growing in our country, even though rather slowly when compared to the USA, for example.

The following questions were all problem specific, and were carefully analyzed using appropriate statistic tools.

A result of high importance was the confirmation of the presence of the problem in our country, with around 94% of the population stating that they possess clothing which is unused, as can be seen in Fig.2.

Moreover, when asked about their current solutions to this problem, 63.8% answered that their unused clothing is thrown or given away, as shown in Fig.3.

More detailed question was also asked about the recipients

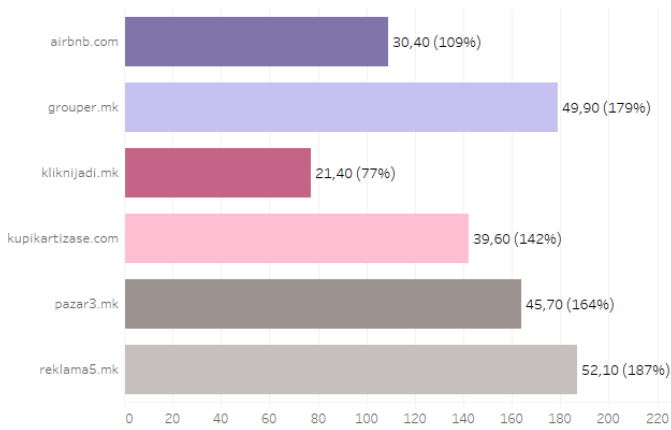


Fig. 1. Initial research results about the usage of e-commerce platforms

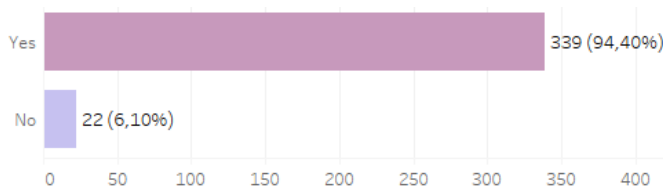


Fig. 2. Initial research results about the presence of unused clothing

of the gifted clothing, which in 87.9% were relatives and acquaintances.

Finally, the inclination to share and/or rent clothing was evaluated, by asking about the willingness to use an online platform enabling that. The results show that around 80% of the population is willing to use this kind of an online platform, as can be seen in Fig.4.

Following the individual analysis of each question, a Pearson's coefficient correlation matrix was computed, so that analysis of the dependency between the given answers could be performed. The interpretation of the correlation coefficient was done considering the notion of its dependency on context and purpose [4] [5].

Seeing that the correlation coefficient between the answers about the feasibility of the platform and the willingness to use it is around 0.7, we can state that there is a high correlation between them. Other significant dependencies could not be

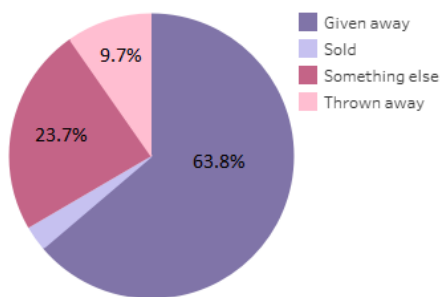


Fig. 3. Initial research results about current solutions for unused clothing

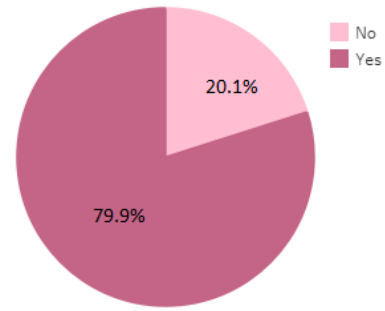


Fig. 4. Initial research results about the willingness to use the platform

concluded.

The main conclusions from the initial research are that there is a large population that could benefit greatly from our solution and that the inclination to share and/or rent clothing is rather satisfactory.

In addition, once some less frequent responses were studied in detail, the concept we initially proposed was altered to include sharing, swapping and renting of clothing. This changes, together with the need for more detailed statistics brought about further research.

B. Further research

Further research was done by conducting a survey which focused on presenting the idea in more detail, so that the results could be later used as guidance in the development of the software solution. The accent was put on sharing and swapping of unused clothing, as well as renting of more expensive special occasions garments. 317 people were reached by this survey in approximately two weeks.

The demographics of the sample was similar to the one in the initial research, consisting of mostly female individuals under the age of 40.

Additionally, the questions about the consumption of digital content were examined and showed similar results, when compared to those from the initial research.

All the other questions were concerning the specific problem. The results were studied, but the responses were more scattered than in the initial research, which made the analysis of the overall data more difficult.

The willingness to shop at a second hand store was of high interest, when thinking about the sharing aspect of the solution. The results shown in Fig.5. make the unwillingness to do so more than evident, with about 74% of the population stating that they do not shop at such stores.

Another question of importance was the one about the willingness to share clothing with friends and family, again adhering to the sharing concept. The percentage of the population that swap or give clothing to relatives and friends is 54.6%.

The following questions were designed to cover the renting aspect of the solution. Around half of the population stated that they would rent an outfit for some special occasion, however only around 30% stated the same when asked about

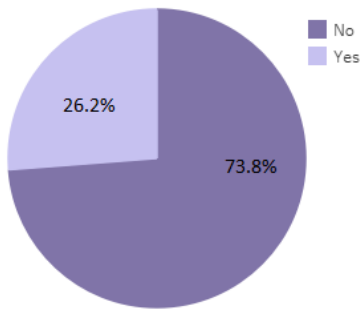


Fig. 5. Further research results about shopping at second hand stores

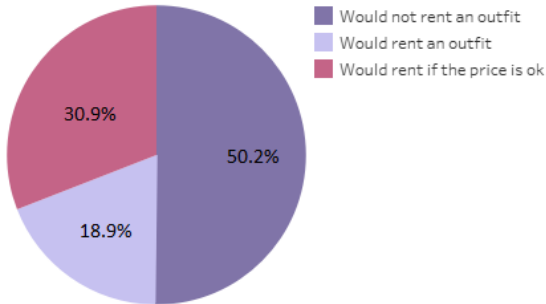


Fig. 6. Further research results about the willingness to rent an outfit for a special occasion such as graduation, a formal event etc.

their wedding dress or tuxedo. The results are shown in Fig.6.

Finally, the overall willingness to use an online platform to share and swap, or to rent clothing was examined. This was done using separate questions, so that more detailed results could be obtained. The results given in Fig.7. show that around 54% of the population is willing to use an online platform for sharing and swapping of garments and slightly less, around 48% are willing to use such a platform for renting.

These results are significantly worse than the ones obtained during the initial research. Dependency between the answers to the questions was examined for this survey as well, showing significant dependency in some cases. The first notable correlation is between the willingness to rent clothing in general, and to do that using an online platform. This

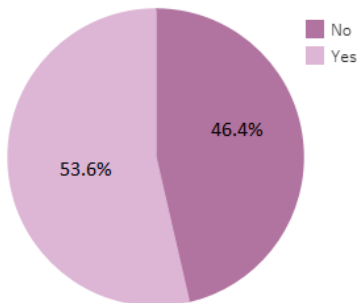


Fig. 7. Further research results about the willingness to use the suggested online platform for sharing

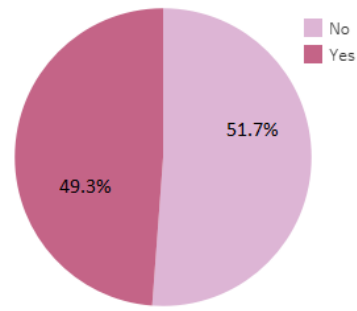


Fig. 8. Further research results about the willingness to use the suggested online platform for renting

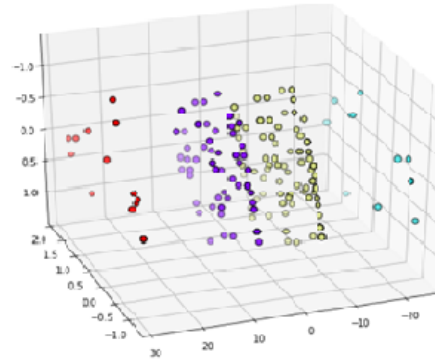


Fig. 9. Customer segmentation

shows that people who are inclined towards renting more expensive clothing, have no problem of doing that online.

Another correlation can be seen between the willingness to rent luxury clothing, and to rent clothing for weddings, including wedding dresses and tuxedos.

Furthermore, there is an important correlation between the willingness to rent and the willingness to share or swap garments. This shows that people who would swap or share clothing are more likely to embrace the idea of renting clothing as well.

The data from this survey was further used to define four customer segments. This was performed by clustering of the answers given by the respondents, which can be seen in Fig.8. and Fig.9.

The first customer segment is made of people who are not open to the idea of renting garments. Their opinions about swapping and sharing of clothing are mixed.

The second segment of customers is made of respondents who are willing to rent formal or luxury clothing, even for their weddings.

Most of the sampled population is found in the following two segments, made of people who are willing to rent clothing, only if such a rental is a good bargain. One group of these respondents are not open to renting clothing for their wedding day, while the other group are embracing that idea as well.

The fact that only about half of the population are open to renting and/or sharing and swapping of garments is of utmost interest, when the realization of this solution is considered.

The main conclusion from this extended research is that there is a possibility for success of this sharing economy platform. However, that can not be easily accomplished at the moment. Extensive marketing and advertising needs to be done first, so that the benefits of such a solution are well understood by the general public.

At that moment, this platform can possibly achieve the success of the prominent businesses that do this worldwide.

III. SOFTWARE SOLUTION

In this section we present the business and technical aspect of our solution.

A. Business aspect

The importance of the business aspect in creating any software solution should never be underestimated, as it is a major contributor towards the success of any application.

Every business can be elevated with the Business model canvas [6] which uses nine building blocks to describe and analyze the model. The strengths and weaknesses of our idea are presented using this model.

Value proposition is the combination of products and services a solution provides to its customers [6]. It is based on solving some problem or satisfying a need. The value proposed with our solution comes from the fulfillment of the need of constantly buying new clothing as well as disposing of unused clothing.

Concerning the market that is targeted by this solution, at the moment, only a hypothesis can be made about who would be our customers.

However, the distribution channels that reach the customers can be clearly stated. Our solution has a combination of virtual and physical channels, both equally important. The platform itself is the virtual channel that allows customers to make reservations, order, or just browse the items. However, the process of delivering and maintaining the products is done by the physical channel.

When sharing economy is discussed, reviews and ratings are one of the key aspects that straighten the relationship with the customers, which is of great importance. This concept is included into our solution.

An essential aspect of the business model is the revenue acquisition. Taking into account that the solution is designed to be free of charge for customers, the revenue acquired is highly dependent of our partnerships with fashion brands and local stores, which would pay for the usage of our services. Additional revenue could be acquired through advertisement. At last, it is of paramount importance that the online activities provided are well-developed, so that customers are guaranteed enjoyable experience and safety of information.

B. Technical aspect

The solution we created has three integral parts, where the API application is the middle-ware between the database

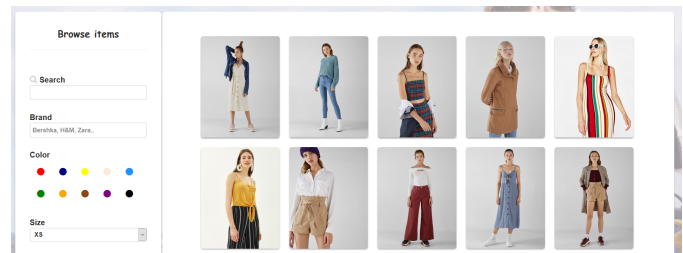


Fig. 10. Search component

system and the client application. It has several main functionalities, which we present through the client application. It is important to state that these functionalities are only available to users that are registered.

The search component which can be seen in Fig.9, provides the ability to search items of clothing. Various filters are included to enable easier use and therefore greater customer satisfaction. A component was created to view the details for each garment, which are provided by the customer that has posted it for sharing, or by the company that rents it. Therefore, a component was also created to enable creating posts by the customers. Another important functionality that was enabled is the ability to add and view reviews.

There is still a lot to be done in order to completely cover the desired functionalities of our idea, and we are currently working on such improvements to our solution.

IV. CONCLUSION

The purpose of our solution is to reduce the pollution of the environment that is caused by the fashion industry, by providing a sharing economy platform that enables sharing and renting of clothing online.

Research was conducted in order to assess the possibility for a successful realization of this solution in our country. The results show willingness to use our platform by at least half of the population.

Consequently, we are optimistic about the future possibilities of our solution, which is why we are working on developing more features of our software solution, while continuously conducting more research locally.

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