Enabling the hybrid retailer.

Platform design to support traditional retailers in their online presence – overcome barriers and improve value proposition

Keywords: Platform design, online, offline, city centre, retail
Graduation committee:
Head professor: Prof.dr. Yao-Hua Tan
1st Prof.dr.ir. Marijn Janssen
2nd Dr.ing. V.E. Scholten

Name: Pieter Oskam 1338765
E-mail: P.H.Oskam@student.tudelft.nl
Study Program Systems Engineering Policy Analysis and Management – Information Architecture
Faculty: Computer science
Technology, Policy and Management
University: Delft University of Technology
Main text words: 42.543
Brick-and-mortar shops: Retailers who only have a physical shop where all retailing activities take place.

Click-and-brick shops: Retailers who have an offline/physical shop and online sales channel.

Click-and-click shops: Shops only performing sales activities online.

Hybrid retailer: A mixture between brick-and-mortar and click-and-brick shops where in each channel different retailing activities can take place.

Orchestration. A research topic which looks on how different techniques and services work together to complete certain tasks.
I this section I would like to take the opportunity to thank everyone who has contributed in each way to this thesis. First and most of all I would like to thank the committee for providing me the opportunity to graduate on this topic. I was intrinsically motivated for this project enabled me to write this thesis with more motivation. The idea of the platform was born from a business opportunity. This project enabled me to become an entrepreneur directly after my graduation. I hope I that the retailer platform will become a success. In that way the TU Delft can show its contributions to the local economy of Delft and potentially more cities. Marijn Janssen always provided his feedback very structured, friendly and inspiring way. Marijn Jansen has one advice in choosing a graduation committee and that is: “Choose a committee chair where you feel comfortable with”. Well, I managed to achieve that with my choice. Victor Scholten gave detailed feedback and pointed me on the scientifically focus. Knowing that scientific focus is not my best skill, Victor has helped me a lot.

I would like to thank all retailers, entrepreneurs and other retailer representatives who provided me information and inspiration in interviews and other conversations. Their enthusiasms helped me in developing the platform with a lot of positive energy. Their time was crucial is understanding retailers and the complex context. I spoke with many retailers, representatives and experts but most of all I would like to thank Joost Verhoeff, Arjan Steendam and Michiel Kranveld since I consulted them many times and providing me valuable information and inspiration.

I would like to thank my friends and girlfriend for supporting me in in the struggles associated with writing a thesis. My girlfriend was willing to read large parts of my thesis to check on spelling mistakes and to point out unclear sentences/paragraphs. Writing is not my best skill, therefore my girlfriend really helped in writing a better thesis.
EXECUTIVE SUMMARY

A widely known issue in western countries is that retailers in city centres are affected by the rise of e-commerce. Consumer needs have changed and city centre retailers are not able to adapt to it. This results in less crowded shopping streets, less expenses at city centre retailers, bankruptcy of shops, decreasing revenue of other entrepreneurs and less attractive city centres. Individual retailers are not able to improve their online presence, since they do not have the resources or time expertise, or because they feel that their shop is not suitable for online sales. Though, city centre retailers have a huge potential, especially if they are able to lower the search costs for their products. This problem of city centre retailers is widely acknowledged and many technology driven initiatives were taken by governmental institutions to solve the problem, which were mostly unsuccessful. The aim of this study is to research what is needed from the retailer, consumer and from the technology perspective to develop a platform based solution. This platform lowers the search costs and mitigates the barriers in adopting online presence for retailers. For the development of this platform a design science research methodology is used. The city of Delft is used as case-study since it is facing this problem as well and the governmental institutions are encouraging retailers to earn online.

The main research question is “How should a service platform be designed and implemented to enable city centre retailers to become a hybrid combination between online and offline commerce?”. To research this question a design science research methodology for information systems was used. This methodology includes the following phases:

- Identify problem & motivate
- Defining the objectives of a solution
- Design & development
- Demonstration
- Evaluation

Within each phase, the platform solution has been researched from four perspectives; the platform, retailer, consumer and technology perspective. The interrelation between the perspectives is high, therefore the design space should be identified for all perspectives before making the final design.

In the platform perspective, two main sources of information are used. Literature is used to get a general understanding of platform related design problems and a benchmark of existing platforms. The main theories derived from literature are network-theory and two-sided markets. The benchmark is used to refine the design problems derived from literature and included widely known successful platforms. From the network theory we learn that the value of the platform is dependent on the number of retailers, the number of consumers and the match between them. The value of the platform for retailers is linear to the number of consumers and vice versa. Clearly, here is a chicken-and-egg problem. Users of the platform are likely to join and the value of the platform is higher than the investment costs. In the first phase, the number of users is low, which means a low platform value while the investment costs are the same. To gain more users, the investment costs must be lowered or the platform value must be increased. To lower the investment costs, early adopters must be subsidized in terms of money, resources and preferences. To increase the platform value, the match between first retailers and consumers must be optimized. This subsidizing and matching must continue until the critical mass point is reached. Critical mass is defined as a sufficient number of adopters of an innovation in a social system so that the rate of adoption becomes self-sustaining and creates further growth.
To define the possible solution space from the retailer perspective, several interviews were conducted. These interviews revealed that retailers see an opportunity in the proposed platform. However, individual retailers are sceptical when it comes to their expected revenue increase as a result of the platform. Due to this scepticism, financial and time investments from individual retailers are not expected to be high whilst commitment is essential for a valuable platform. Retailing organisations do want to provide this commitment. The same accounts for municipality organisations such as the city centre marketing and entrepreneurial fund. City centre retailers can be distinguished on two important aspects. Firstly they can be distinguished by size, smaller retailers are more willing to adopt the platform, while large brand stores show no interest in a local platform. Secondly, they can be distinguished by their degree of digitalization. The level of digitalization differs from not having a single electronic source of their product catalogue to having 30% of their product catalogue in a web-shop. Generally retailers are not willing to spend more than a few hours per week on their digital presence. Often these retailers do not have the right skills in adopting an internet strategy. This implies a large effort for the platform owner and the technology. From the interviews we learned that retailers tend to have resistance against the prospect that they cannot distinguish themselves from other retailers within a uniform platform.

Looking from the consumer price perspective, city centre retailers have a huge potential especially if they lower their search costs. Lowering the search costs would mean that products of city centre retailers are easier to find. In practise, this means a fast and 24 hours a day accessibility of the shops by the use of internet. Many studies were found regarding consumer behaviour, however they either focus on online or on offline retailing, whilst the platform focuses on a combination between online and offline. For this thesis, the combination between those elements is used and supported by a survey. Regarding offline consumer behaviour, service, trust and certainty are important elements. From online literature, the main requirement for consumers is to quickly see images of products and being able to acquire detailed information about it. Two main types of consumers have been identified, the fun- and run-shopper. Both consumer groups have different requirements and therefore the platform must support both types of consumers.

After the identification of the solution space, a design of the platform was made. This design process is not straightforward considering the contradicting requirement and interrelation. From the platform perspective we learn that the platform should start with retailers which are:

- Small or medium sized
- Willing to join and invest
- Can function as ambassador
- Have product categories suitable for the platform.

To achieve the critical mass more rapidly, retailers who are located in a part of the city centre should be included. Retailers require a own place within the platform, where only their products are listed. Though retailers have their own sections, the same layout is applied for all retailers in order to provide customers with a clear and uniform interface. The indexation of products must be done by the platform owner in order to lower retailer barriers and guarantee high quality data.

Most literature regarding customer behaviour in retailing either focus for offline or online shopping. This made it more difficult to derive preference and requirements since the platforms focuses on a hybrid situation. Secondary literature sources provide more accurate results in terms of hybrid assessment, geographical focus and time of research. A literature review resulted in the requirement that a complete product was needed, offered with images. This requirement brings many implications for the retailers and technology. The choice on including a functionality should be based on the trade-
off between added value and costs. Estimating the added value was not possible using literature, therefore a survey was conducted to get insight in the added value of each design option.

Considering the requirements from the consumers and retailers, the demands on technology are high. Retailers want to spend only limited resources on their online presence and only want to invest with a certain prospect on financial return. Many types of retailers exist regarding size, willingness, product catalogue and accessibility of (digital) product information. Consumers have a high demand on information accessibility, reliability and completeness, and want to access this using multiple devices on different locations. From platform research and network theory we learn that platforms have a high chance of changing over time, requires high investments and a well-defined strategy. The platform architecture should be designed in such a way that it is flexible and scalable. The acquiring of data can be described as the critical backbone. The most challenging part is to limit the time needed by retailers to index their products and keep the data up to date while providing high quality product information with images to consumers. Many retailers do not have an inventory lists, which makes the indexing of products difficult.

A business case was developed to determine the viability and added value of the platform. For the first phase development, an investment is needed of €35,000 euros. Third parties like the government, innovation funds and the entrepreneurial fund within Delft are willing to make this investment. Individual retailers are less willing to make a financial contribution. A commission based fee depending on the number of sales is viable, however this complex to implement in the first phase. A cost per view (CPV) is seen as the best option since it is preferred by retailers and it can be easily implemented. The first phase is all about gathering users in order to gain network value and less focus must be on making revenue. Making special financial offers to the first adopters is necessary. The platform is financial viable, however the first phase needs to be endured. The main uncertainty is the expected use of consumers and retailers. After the first phase of developed, the validity can be determined with a higher certainty.

Considering the implementation strategy, a lot can be learned from platform benchmarking and network theory. The focus in the first phase should lay in achieving the critical mass. Approximately 10-25 prominent retailers from a specific region should be included who also have a specific product range. Though everyone can join, the focus should lie on expanding the platform use through the whole city. Retailers and third parties should actively be involved in the development process in order to gain trust, ambassadorship and willingness. This enables us to adapt the platform to new insights and generate more active users. When a successful first user base is established, elements such as local-local delivery could be developed.

After the design phase, still uncertainties were present. The demonstration phase focuses in mitigating the uncertainties. Each design decision is a trade-off between costs and expected revenue. For determining the costs and the expected value for consumers and retailers, a demonstration with an attached survey was deployed. Retailers indicated that the platform is of high value and that they are willing to pay for it. A commission percentage of 6.65 percent per sale and a costs-per-view of 0.06 to 0.15 euros is desired.

The survey amongst 134 consumers revealed that the platform is rated as highly valuable, especially for searching amongst small and midsized retailers. Extra options of the platform such as local-to-local delivery are valued as high while elements such as loyal-tee programs are valued lower.

The demands on technology were challenging, therefore an algorithm has been developed and tested to semi-automatically index products based on EAN barcodes. This techniques proved to have an accuracy of 84%. This accuracy differs per product type. The average indexing time per product with
images ranges from 11 to 35 seconds. This result matches the criteria of having a high index rate, products with images and a limited amount of resource used at the retailer side. This way, shops can be indexed within 0.5 to 2 days. This way investments costs are reduced while retailer and consumer requirements are met.

Overall we conclude that the platform is of a high added value to all stakeholders and is financial viable. The requirements from retailers and consumers are stringent and challenges the technology and its implementation. However, technology seems to be able to fulfil these requirements. Setting up a network comes with a high degree of uncertainty and retailer selection is essential. The aim must be to rapidly acquire a critical-mass in order to achieve a self-sustaining growth.

The main contributions of this thesis are performed in platform design methodology using the design approach. The design approach refined the existing platform related literature and could be used in other platform designs. Furthermore, the importance of standardization regarding the benefits of reusability is shown. The societal contribution is to develop new ways for business to adapt, which has an added value for local economies and for individual consumer purchase optimization.

One of the/the main limitations of this research was the lack of relevant literature in the retailer and platform perspective. Retailing characteristics differ per region and change over time. The literature focusses on offline or online retailing whilst the platform focusses on a hybrid combination. The city of Delft is used as an example in this research. Within the design, the unique characteristics of Delft are acknowledge and care was taken to create a generalizable design. Further development of the design should validate the generalizability.

Further research recommendations are gaining more insight in platform by creating a platform development framework. Platforms are becoming increasingly popular and a framework could be used to compare platforms and/or to develop new platform initiatives. The platform is a new business model for retailers which enables them to adapt to the changing environment. There are many more business which are currently struggling with adapting to new contexts. Further research on methods or proof of concept which helps business to adapt could be beneficial for economies.
## Contents

1 Introduction .................................................................................................................. 3  
1.1 Proposed design ........................................................................................................ 4  
1.2 The Problem ............................................................................................................ 5  
1.3 Scope and Focus ....................................................................................................... 5  
1.4 Report outline .......................................................................................................... 6  
1.5 Research methodology ............................................................................................ 6

2 Problem identification .................................................................................................. 9  
2.1 Knowledge gap ......................................................................................................... 9  
2.2 Problem statement .................................................................................................... 10  
2.3 Research Objective ................................................................................................. 11  
2.4 Involved stakeholders .............................................................................................. 12  
2.5 Scientific relevance ................................................................................................ 12  
2.6 Societal relevance ................................................................................................... 13  
2.7 Research questions ................................................................................................ 13  
2.8 Possible results ........................................................................................................ 15

3 Defining objectives of a solution ................................................................................ 17  
3.1 Methodology ........................................................................................................... 17  
3.2 Platform perspective ............................................................................................... 18  
3.3 Retailer perspective ................................................................................................. 28  
3.4 Consumer perspective ............................................................................................. 35  
3.5 Technology perspective ........................................................................................... 42  
3.6 Business case .......................................................................................................... 42  
3.7 Legal requirements .................................................................................................. 43  
3.8 Conclusions on design space .................................................................................. 44

4 Design and development ............................................................................................. 47  
4.1 Research methodology .............................................................................................. 47  
4.2 Platform perspective ............................................................................................... 47  
4.3 Retailer perspective ................................................................................................. 53  
4.4 Consumer perspective ............................................................................................. 57  
4.5 Technical perspective ............................................................................................. 60  
4.6 Conclusions on design phase .................................................................................. 70

5 Business case .............................................................................................................. 72  
5.1 Investment ................................................................................................................ 72  
5.2 Market size ............................................................................................................... 73
5.3 Market strategy ................................................................. 74
5.4 Financial ........................................................................ 74
5.5 Strategy over time .......................................................... 77
5.6 Conclusions on business case ....................................... 78
6 Demonstration & evaluation ............................................ 79
  6.1 Consumers .................................................................. 79
  6.2 Retailers ...................................................................... 86
  6.3 Technology .................................................................. 89
7 Conclusions & discussion ................................................... 97
  7.1 Main Findings ............................................................... 97
  7.2 Scientific relevance ..................................................... 101
  7.3 societal relevance ....................................................... 102
  7.4 Generalizability .......................................................... 103
  7.5 Limitations .................................................................. 104
  7.6 Recommendations ...................................................... 105
  7.7 Reflection .................................................................. 105
8 References .......................................................................... 107
Appendix A: Platform benchmark based on literature .......... 1
  Platform benchmarking ................................................... 1
Appendix B: Data Acquiring .................................................. 2
Appendix C: Interviews .......................................................... 3
  Arjan Steendam ............................................................... 3
  Yvo Sonneveld ............................................................... 6
  Michiel Kraaijveld ............................................................ 8
  Joost Verhoeff ............................................................... 10
  Marian den Boer ............................................................. 12
  Leon de bakker ............................................................... 12
  Hugo overvoorde ............................................................ 14
  Tjan loenen ................................................................. 15
  Praxis (Informal) ............................................................. 15
  Het pumte (informal) ..................................................... 15
Appendix D: Retailer sessions ............................................... 16
  Delft verdient online (Delft earn online) – 1 ....................... 16
  Delft verdient online (Delft earn online) - 2 ....................... 16
  Netwerk binnenstad (City centre network) – 1 ..................... 16
  Pitch contents: ............................................................... 16
LIST OF FIGURES

FIGURE 1: CURRENT RETAILER SITUATION ................................................................. 4
FIGURE 2: PROPOSED SITUATION WITH PLATFORM: .................................................. 4
FIGURE 3: STEPS IN THE DESIGN RESEARCH METHOD FOR INFORMATION SYSTEMS BY PFEFFER (2007) ......................................................... 6
FIGURE 4: PHASES OF RESEARCH ............................................................................... 8
FIGURE 5: PERSPECTIVES ......................................................................................... 8
FIGURE 6: FLOW DIAGRAM OF RESEARCH ............................................................... 15
FIGURE 7: EXAMPLE OF A DESIGN VARIABLE .............................................................. 18
FIGURE 8: INDICATORS OF REQUIREMENTS, GOALS AND KNOWLEDGE GAPS ................................................................. 18
FIGURE 9: NETWORK EFFECT; EXAMPLE OF THE TELEPHONE (SOURCE: WIKIPEDIA.ORG) ................................................................. 20
FIGURE 10: DESIGN VARIABLE: GRAPHICAL DEMARCATION FOR FIRST PHASE ................................................................. 23
FIGURE 11: DESIGN VARIABLE: HOW CAN RETAILERS DISTINCT THEMSELVES? ........................................................................... 24
FIGURE 12: DESIGN VARIABLE: PROCESS STEPS INCLUDED IN PLATFORM ........................................................................... 24
FIGURE 13: DESIGN VARIABLE: HOW TO EMBED HOSPITALITY SERVICES ........................................................................... 33
FIGURE 14: DESIGN VARIABLE: IN WHICH DEGREE CAN RETAILERS DISTINCT THEMSELVES ........................................................................... 34
FIGURE 15: ONLINE RETAIL SHARE PER HOME MARKET ................................................. 36
FIGURE 16: SATISIFIERS IN WEB-SHOPS (ADAPTER FROM INTOMART GTK 2013) ........................................................................... 38
FIGURE 17: IMPORTANT FACTORS IN PURCHASE DECISION (SOURCE: E-COMMERCE 2013) ........................................................................... 40
FIGURE 18: DESIGN VARIABLE: GEOGRAPHICAL DEMARCATION ........................................................................... 48
FIGURE 19: HIGH LEVEL BPMN ................................................................................. 65
FIGURE 20: UML DIAGRAM REPRESENTING THE DATA ARCHITECTURE ................................................................. 67
FIGURE 21: DATA ARCHITECTURE OF Uploaded PRODUCTS .................................................. 68
FIGURE 22: LONG-TAIL EFFECT IN ONLINE AND OFFLINE RETAIL ................................................................. 76
FIGURE 23: GENDER DISTRIBUTION OF CONSUMER SAMPLE .................................................. 80
FIGURE 24: AGE DISTRIBUTION OF CONSUMER SAMPLE .................................................. 80
FIGURE 25: ONLINE ORIENTATION BEFORE OFFLINE PURCHASE .................................................. 81
FIGURE 26: ONLINE ORIENTATION PER PRODUCT GROUP .................................................. 81
FIGURE 27: RESULTS ON ELEMENT "SEARCHING SHOPS" .................................................. 82
FIGURE 28: PRODUCT INFORMATION ........................................................................ 82
FIGURE 29: PERCEIVED USEFULNESS OF SHOP SIZES .................................................. 83
FIGURE 30: PERCEIVED USEFULNESS ON THE PROCESS STEPS .................................................. 84
FIGURE 31: EXPECTED VALUE PER ADDITIONAL SERVICE .................................................. 84
FIGURE 32: HOW MUCH EUROS ARE CONSUMERS WILLING TO SPEND ON LOCAL-TO-LOCAL DELIVERY .................................................. 85
FIGURE 33: AVAILABILITY OF DIGITAL INFORMATION SOURCES AT RETAILERS .................................................. 87
FIGURE 34: RETAILER DISTINGUISHABILITY PREFERENCES .................................................. 87
FIGURE 35: PERCENTAGE OF RETAILERS DESIRING A CERTAIN FUNCTION .................................................. 88
FIGURE 36: PERCENTAGE OF RETAILERS' PREFERRING A PRICING SCHEME .................................................. 88
FIGURE 37: EXPERIMENT SETUP ........................................................................... 90
FIGURE 39: SAMPLE GATHERING PROCESS ................................................................... 91
FIGURE 40: SAMPLE PROCESSING PROCESS ................................................................... 93
**LIST OF TABLES**

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>TABLE 1</td>
<td>COMPLETE PRODUCT PRICE COMPARISON ONLINE AND OFFLINE RETAIL</td>
<td>3</td>
</tr>
<tr>
<td>TABLE 2</td>
<td>INFORMATION SOURCES PER PERSPECTIVE</td>
<td>17</td>
</tr>
<tr>
<td>TABLE 3</td>
<td>COMPARISON FACTORS USED IN PLATFORM BENCHMARK</td>
<td>21</td>
</tr>
<tr>
<td>TABLE 4</td>
<td>RETAILER DISTINCTION PER PLATFORM</td>
<td>24</td>
</tr>
<tr>
<td>TABLE 5</td>
<td>CONSUMER MOTIVATIONS TO SHOP ONLINE: (INTOMART GFK, 2013)</td>
<td>37</td>
</tr>
<tr>
<td>TABLE 6</td>
<td>KNOWLEDGE GAPS PER ASPECT PER PERSPECTIVE</td>
<td>45</td>
</tr>
<tr>
<td>TABLE 7</td>
<td>ASSESSMENT FRAMEWORK FOR THE GEOGRAPHICAL DEMARCATION</td>
<td>48</td>
</tr>
<tr>
<td>TABLE 8</td>
<td>ASSESSMENT FRAMEWORK FOR THE SELECTION OF PRODUCT TYPES</td>
<td>49</td>
</tr>
<tr>
<td>TABLE 9</td>
<td>DETAILED ASSESSMENT FRAMEWORK FOR THE PRODUCT TYPES</td>
<td>50</td>
</tr>
<tr>
<td>TABLE 10</td>
<td>ASSESSMENT FRAMEWORK FOR DETERMINING THE COMMITMENT BY RETAILERS</td>
<td>52</td>
</tr>
<tr>
<td>TABLE 11</td>
<td>ASSESSMENT FRAMEWORK FOR SELECTION OF RETAIL TYPES</td>
<td>54</td>
</tr>
<tr>
<td>TABLE 12</td>
<td>ASSESSMENT FRAMEWORK FOR THE RETAILER DISTINGUISHABILITY</td>
<td>56</td>
</tr>
<tr>
<td>TABLE 13</td>
<td>ASSESSMENT FRAMEWORK FOR DETERMINING THE INFORMATION DETAIL LEVEL</td>
<td>57</td>
</tr>
<tr>
<td>TABLE 14</td>
<td>ASSESSMENT FRAMEWORK FOR SELECTING WHICH PROCESS STEPS TO EMBED</td>
<td>58</td>
</tr>
<tr>
<td>TABLE 15</td>
<td>ASSESSMENT FRAMEWORK FOR SELECTING ADDITIONAL SERVICES</td>
<td>59</td>
</tr>
<tr>
<td>TABLE 16</td>
<td>POTENTIAL ADDITIONAL SERVICES</td>
<td>75</td>
</tr>
<tr>
<td>TABLE 17</td>
<td>DATA/INFORMATION SCORES</td>
<td>90</td>
</tr>
<tr>
<td>TABLE 18</td>
<td>KEYWORD RETRIEVAL RESULTS PER PRODUCT TYPE</td>
<td>93</td>
</tr>
<tr>
<td>TABLE 19</td>
<td>KEYWORD INDEXING PER PRICE GROUP</td>
<td>94</td>
</tr>
<tr>
<td>TABLE 20</td>
<td>IMAGE INDEXING RESULTS PER PRODUCT TYPE</td>
<td>94</td>
</tr>
<tr>
<td>TABLE 21</td>
<td>IMAGE INDEXING RESULTS PER PRICE GROUP</td>
<td>95</td>
</tr>
<tr>
<td>TABLE 22</td>
<td>COMPARISON FINDINGS OF THIS RESEARCH AND HAGIU</td>
<td>98</td>
</tr>
<tr>
<td>TABLE 23</td>
<td>BROAD ASSESSMENT FRAMEWORK FOR PRODUCT TYPE SELECTION</td>
<td>18</td>
</tr>
</tbody>
</table>
1 INTRODUCTION

Since the introduction of the internet, a lot has been changed, including the retail sector. (Chircu & Mahajan, 2006): “The information economy has created more informed and demanding consumers than ever before. Successful retailers are responding to the needs of these customers by improving the trade-off between the customer benefits and transaction costs, thus creating superior customer value”. “Retailers started displaying and selling products through e-commerce channels. E-commerce definitely changed the retail business. Companies serve different channels and consumers behave different as well. Starting an online sales channel is profitable for a brick-and-mortar retailer (RolandBerger, 2013; Weltevreden & Boschma, 2008). Not all retailers are present online though, in particular the small and midsized retailers located in shopping streets or shopping malls (Weltevreden, et al., 2006) (HBD, 2012). Those retailers see a decrease in revenue but encounter barriers in ad the online channel (BizMD, 2011; Weltevreden, 2007). In this thesis a design for an online retailing platform will be made which enables retailers to start serving the online retail channel.

The value proposition of physical shops without an e-commerce channel (brick-and-mortar) shops is quite good, however the search costs and perceived value of those shops must be better (Brynjolfsson, et al., 2009; Oskam, 2014). Literature with a consumer economical perspective provides a comparison between offline and online sales. A full comparison between online and offline shops regarding the full transaction costs by consumers is shown in Table 1: Complete product price comparison online and offline retail. Costs can be seen as a combination between price, time and effort. Literature provides many factors in consumer transaction costs (Chircu & Mahajan, 2006), for this study, the most relevant factors for comparing online and offline retail are chosen and are adapted from existing literature. Research has shown that the selling price in online and offline stores are equal (Grewal, et al., 2010), though the selling price do differ for certain product types and product price categories. Risks costs imply the risk of buying product which on a later term has to be returned or was found not suitable. The shipping and handling costs for an offline retailer is generally lower since no transport agent is required, however there are costs involved when going to the store by car, foot, public transport, bicycle. Besides economical literature, also empirical studies shows the differences between costs and shows that consumer have the perception that online products have a lower price (Strader & Shaw, 1999). From the economic theories and empirical studies we can conclude that offline retail has a high potential, and can be improved by lowering the search costs.

Table 1: Complete product price comparison online and offline retail

<table>
<thead>
<tr>
<th>Factor</th>
<th>Online</th>
<th>Offline</th>
<th>Explanatory note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td></td>
<td></td>
<td>Research showed no difference. Though, price differs per product type and price group</td>
</tr>
<tr>
<td>Transaction costs</td>
<td>Slightly higher</td>
<td>Slightly Lower</td>
<td>Cash/credit card easier versus online payment</td>
</tr>
<tr>
<td>Search costs</td>
<td>Low</td>
<td>High</td>
<td>Web browsing easier than walking/driving</td>
</tr>
<tr>
<td>Shipping and handling</td>
<td>Higher</td>
<td>Lower</td>
<td>No shipment costs offline. Though costs are involved when visiting the city centre.</td>
</tr>
<tr>
<td>Waiting costs</td>
<td>Higher</td>
<td>Lower</td>
<td>1-3 days versus 20 minutes</td>
</tr>
<tr>
<td>Risk costs</td>
<td>Higher</td>
<td>Lower</td>
<td>Offline certainty about product selection, delivery and guarantee</td>
</tr>
</tbody>
</table>
A lot of literature is available regarding offline and online retailing together with customer behaviours but lacks in aspects where a combination between. Current literature does not provide many conclusive answers to the question why retailers are not yet present online. From the customer perspective literature is also not conclusive when it comes to the explanation why they spend less at city centre retailers (Weltevreden, 2007). (Roland Berger, 2013) Suggests that brick-and-mortar retailers have a good value proposition to customers and could increase revenue when they enter the online sales channel. Non-scientific sources suggest that retailers encounter barriers in setting up the online channel or that their retailing sector is not suitable for the online environment. Those barriers are a lack of knowledge or resources such as website development and hosting, marketing, legal requirements, payments methods, time and logistics (BizMD, 2011). The focus and added value of this research is in combining online and offline consumer literature and by researching why retailers are not adopting the online sales channel.

The future of the retailing types are unclear but current figures suggest that click-and-click shops will increase (Roland Berger, 2013). According to Weltevreden (2007) E-commerce is a substitute or complementary depending on the type of product and geographical area. Retailing characteristics highly differ per country and region, therefore, this study will focus on studies performed in the Netherlands. The study by Weltevreden and Gilly expected that the role of e-commerce would differ in time, but it is sure that the role will increase. Weltevreden published nine studies on internet adoption by city centre retailers, mostly empirical driven, and shows the benefits of adopting e-commerce at city centre retailers. The studies are used as important starting point from the retailer perspective in this thesis.

1.1 Proposed Design

So far we identified three important elements: First is that the value proposition of brick-and-mortar is high and can be improved when their search costs are lowered when adopting e-commerce. Second is that many brick-and-mortar shops, especially small ones located in city centres, are not yet online present because of a lack of resources (time, money, experience) (Boschma & Weltevreden, 2008). Third is that consumer behaviour is changing due to the presence of new internet based services and spend less time or money at offline stores. This thesis focusses on designing a search engine for shops located in city centres. The search engine can be seen as a platform where consumers and retailers gather and share information. The platform proposed in this thesis aims to address those three problems which results in a higher value proposition of city centre retailers. With a platform based solution, Retailers do not have to set up their own web shop and search costs for consumers are lowered. A schematically representation of the current situation is given Figure 1 and the proposed solution in Figure 2. The reduction in lines between retailers and consumers shows the lowering of the search costs. In the proposed solution, the lines represent digital search costs, which is are lowered compared to physical search costs. The lines between the required expertise and the retailers represent the reduction of barriers.
1.2 The Problem

Clearly the city centre retailers are facing harsh times, but other hand the have a lot of potential but do seem to use this. This finding has a lot of impact in society. Many brick-and-mortar retailers in city centres go bankrupt due to the decreasing revenue (Trouw, 2013) (Planbureau voor de Leefomgeving, 2013). This has the consequence of empty shops in city centres, less employment and has a negative impact on the local economy (Platform31, 2014). Since the study of Weltevreden and Gilly in 2007, the percentage of online retail grew steady to a market share of 9.52% representing of total sales of 10.8 billion euros (Online winkelen versus Detailhandel). The percentage of people who use internet to shop grew from 54% to 78% in the period from 2005 to 2010. Looking at more detailed trends from the consumer side, mostly young adults use the internet to purchase items. From these figures we conclude that the percentage of e-shoppers will grow (RolandBerger, 2013). If this retailing trend will continue, the local economy can deteriorate further.

Clearly there is a new era in retailing, but not yet all small and midsized retailers are present on the web. Though the problem of e-commerce competition is widely acknowledged still many retailers have not found their way to the internet. Studies have shown that city centre retailers a strong relation between the level of online presence and revenue (Weltevreden & Boschma, 2008). The assumption in literature is that retailers who are not yet online present, are facing barriers in the adoption of online presence. However, no thoroughly research has been done on these barriers. Retailers need to adapt to the new consumer demands in order to remain or improve their value proposition. Currently there is no software, method or platform to support retailers in this challenge. This research will adopt design science to develop a solution which addresses the requirements and barriers of city centre retailers and the requirements of consumers. There are examples e-commerce platforms and methods such as EBay, beslist.nl, Alibaba, Marktplaats.nl, Thuisbezorgd.nl, Magento, google shopping etc., but these are not designed for shops located in city centres. In this research the aim is to develop a platform specifically designed for small retailers in city centres, which fills the gap between consumer demands and retailers value proposition.

The main problem owner is the local retailer since they are directly affected by declining sales. However, this declination has a negative impact on the whole local economy, which is the problem of local governments. A less lively city centre has a negative impact on society since city centres remain various events which contribute to culture, cohesion and entertainment. Local governments acknowledge these problems and started initiatives to promote online sales for the local shops. Many of these initiatives are initiated by local governments, technology-driven and almost all initiatives on the various locations have failed (NOS, 2014). This thesis focusses on creating a need-driven financial viable platform.

1.3 Scope and Focus

For a first orientation on this research area, various interviews with retailers are held. From these interviews it can be conclude that retailers do want to adopt a better online barriers and do indeed encounter barriers. A platform suitable for small and midsized retailers is abundant but could be a solution to preserve the competitiveness of city centre retailers. The importance of keeping retailers in the city centres is also relevant to municipalities, other companies in the centre and residents of it. Thus 5 stakeholders can be identified; Retailers, consumers, platform-owner, local government and
other entrepreneurs. The challenge in designing this platform is two-folded. One is the technological architecture and the other is matching stakeholder needs. How the platform should be designed in order to match retailer needs, customer needs, and to acquire, store and represent the data. Another challenge lies in the process of implementation. How to persuade retailers and customers to use this platform? How should the implementation process look like in order to increase the chances of success? The goal of this research is to develop a technical design of the platform and an implementation strategy.

Studies have shown that consumer preferences, adoption of internet by retailers and effects of online presence highly differ per region (Weltevreden, et al., 2008). From this geographical study we learn that independent retailers located in (larger) city centre are most likely to adopt information-online sales strategies. For this study the focus will be on Delft as it is a medium large city with a large centre and retailers indicated to see an added value of the proposed platform solution.

1.4 REPORT OUTLINE
First the research problem will be described. In this first chapter the problem, scope, objectives and relevance will be given. The research problem results in knowledge gaps which lead to the main research question with several sub-questions. For each research question, the relevance and objective will be discussed. Furthermore, research methods will be given which are needed to provide answers to the questions in this proposal. At last limitations in research methods and data will be outlined.

1.5 RESEARCH METHODOLOGY
As already indicated, a design science research methodology (DSRM) approach will be used to research the barriers for retailers in adopting online sales strategy. Current literature ends with the conclusion that barriers exists in this adoption. Design science allows to determine those barriers in more details and translate them into requirements. A methodology has to be chosen which can cope with the complexity and obscurity of this research area. The methodology must also support the nature of the proposed artefact, which is an information system. Pfeffer (2008) acknowledges the importance of design science methods but concluded that less research was done on DSRM in information driven systems and therefore developed a specific DSRM for information systems. The DSRM proposed by Pfeffer aims to help in carrying out these types of research and addresses obscurity characteristic by including and demonstration phase. This DSRM will be used in the research because it fits to the goals and scope of this research.

The six activities proposed by Pfeffer’s, as shown in Figure 3, correspond well to the proposed research objectives presented in this thesis. Each phase will shortly be discussed on how it will be applied and contribute to the goals of this research.

Figure 3: Steps in the design research method for information systems by Pfeffer (2007)
The first phase, problem identification & motivation will be done using the various literature resources about the problem. The problem will be described by showing the dilemmas, knowledge gaps and the impact of the research field. The literature will be used to describe the problem in a scientific manner, which will help us to demark the problem correctly and find additional literature for further phases. The motivation and importance will be supported by quantitative data which are derived from public sources and empirical studies.

Coming from the problem to the defining of the solution space, literature and preliminary interviews will be held in order to present very broad solution space giving listing objectives, requirements and design variables. To specify the solution space, additional interviews with retailers and other important stakeholders will be held. A. During this exploratory phase, specific questions for these interviews can be drawn up. Several design variables will be identified which need to be worked out in the next phase. The design variables all together draw the solution space and are used to tune the whole system.

In the “Design & Development” phase, the variables and requirements will be used together to come to a more definitive design. The various trade-off’s considerations and implications will be elaborated on. In order to mark a conclusion on the right setting of the variable, interviews, surveys and literature will be used. Of course, all variables must be matched to each other to define a coherent system. This is the phase were the artefact will be presented. Since it is an information systems, and UML and BPMN diagram will be presented in order to give more substance to the artefact.

Based on these variables a system will be proposed. Together with a technical foundation in terms of information architecture. A prototype of the platform will be made and demonstrated to the various stakeholders in the “demonstration phase” of Pfeffer. If the previous phase was unable to solve several problems, a demonstration can be used to solve these problems. This demonstration is in the form a conceptual design which presents the functionalities in a way where stakeholders can give an opinion on. These opinions will gathered and analysed in the evaluation phase.

The input of this phase will be used to validate the design and adjust accordingly. This activity involves comparing the objectives of a solution to actual observed results from use of the platform in the demonstration. From previous phases, relevant questions and metrics can be derived. This validation will show whether the designed functions are contributing to solving the problem. Pfeffer suggest to re-iterate to the design and development phase, however, In the scope of this thesis, no re-designs will be tested but further recommendations will be given instead.
The communication phase can be seen as this whole thesis. Starting the problem and its important and a description on how this problems was addressed using the design of an artefact.

For each phase in the DSRM of Pfeffer, different sources of information will be used as shown in Figure 4. Literature is used to generate the insights, with which the interviews can be prepared. These interviews are used to provide exact answers for problems in the platform. Desk research is used to investigate which technologies are suitable to solve the problem. In order to validate the design in a quantitative way, surveys are held.

Three main perspectives will be used which will be described for each phase. The perspectives can be summarized as: The technology has to address both the requirements for the consumers and the retailers. Different sources of information were used per perspective. The perspectives with the corresponding information sources are schematically presented in Figure 5 and are further elaborated on in chapter 2.1.
2 PROBLEM IDENTIFICATION

The goal is to develop a technical design and implementation strategy of a platform specifically designed for the small and midsized retailer. This chapter identifies the knowledge gap, scope, research objective and expected deliverables.

2.1 KNOWLEDGE GAP

Knowledge gaps represent a lack of knowledge, which needs to be fulfilled in order to give an answer to the problem statement. The main knowledge gap in this research is how the design of the platform should look like. Which services need to be implemented and how should they be executed? For this research, four perspectives are used. These perspectives are used to identify the requirements, goals and design decisions. The perspectives will be used in multiple rounds in order to make a general assessment on the design. The use of various rounds and perspectives is due to the interrelations between the requirements and the unknown design space.

2.1.1 Platform perspective

Though retail platforms are a generally known phenomena, not many research have been done on this aspect. These design research could benefit from existing theories regarding platforms. Search the web, google scholar, and science direct on platform research did not yield any suitable results. Though the goal of the research is not to provide knowledge about platforms, many interesting elements of platform design can be found during this research phase. There is not a known structured approach in platform development. To assess the essential of platform design, literature from other research fields can be applied such as innovation, entrepreneurship, service development, network theory and two-sided markets can be used. These various literature sources will be reflected on existing platforms in order to derive useful insights for this design research.

A clear definition of a platform is abundant. In this research the definition of a platform will be: “A platform is a system where many different services, techniques, information or people come together with aim of creating an added value above the individual added value of different services, techniques, information or people”. This definition is not derived from any source but serves as scoping for this thesis. A plan must be made prior to the platform development in order to give structure and prevent potential failures or time-consuming steps. All the N-N relations between techniques need orchestration in order to perform the required tasks of this newly developed platform.

2.1.2 Technical perspective

The amount of available data on the web is growing, with this growth, new information systems are developed. In this research, much focus is on gathering the data from retailers and represent in to consumers. The main knowledge gap from this perspective is how to gather, store and represent the data from the various sources. The platform is complex of nature since it has many users, time sensitive and has to deal with money transfers.

Considering the facts that this platform strongly relies on data collection, information retrieval, structuring and presentation, many aspects from the orchestration principle can be used. Orchestration is targeted gathering and distribution of information systems from the perspective of one person. Technology allows to better collect this data and combine it in a clever way on which new services can be developed. The goal of orchestration is to execute separate activities performed by different actors as one complete systems. In this way, the whole system is more than the sum of all
individual activities. The design of orchestrated services highly focuses on facing the complexity by building in a manageable amount and size of modules. Focus on starting with limited functionalities instead of a big launch. Within the design, trade-offs between feasibility and desirability must be made explicit.

2.1.3 Retailer perspective
From the retailer perspective the main knowledge gap is why many brick-and-mortar retailers are not adapting an online sales strategy while it proved to be profitable. A google search on “Why retailers are not yet online present” mainly results that they see e-commerce as a threat instead of an opportunity. Really understand what retailers see as barriers, what their opinion is about e-commerce and which requirements they have with respect to a newly designed platform contributes to the research goals. Many marketers suggest traditional retailers should become hybrid, serving the offline and online channel (Vlems 2013). The main knowledge gap is how those retailers can be enabled to do so. The knowledge gap can be split up into three separate gaps. The first gap is lack of understanding what retailer requirements are for such a new service. The second gap is to know which services and technologies must be implement in the platform in order to enable those retailers. The third gap is about how the services of brick-and-mortar retailers can be delivered with a higher value to customers.

2.2 Problem statement
From the knowledge gaps a more detailed problem statement can be derived. Brick-and-mortar retailers, especially the small shops, have serious competition from online sales and seek new opportunities to start serving the online channel. These small brick-and-mortar retailers do not have the ability to serve the online channel due to a lack of personnel, expertise or not having the correct firm factors. The whole business setup and the value proposition is different from online sales while on the web, each shop has a relatively equal value proposition. Otto & Chung (2000) identified the city centre retailer above an online retailer on:

- Location: Easy to go to the shop since it is nearby or return the item
- Ability to see, feel or test the product
- Get advice from the sales person

Their barriers to enter online retailing must be lowered while maintaining a competitive value proposition. This research will focus on the development of a platform which enables small and midsized offline retailers to become active in online retailing. This platform could be a chance for retailers to become active online with limited amount of resources while maintaining a good value proposition to consumers.

Since this thesis is performed for the studies Information Architecture and System Engineering policy analysis and management, the scope of this thesis will be focussed on the technology and implementation of this technology. The platform will contain multiple technologies and actors and is thus relevant for the educational contents. The geographical scope would be limited to the Netherlands since the acquiring of data, information and knowledge is relatively easy. The research will performed primarily with retailers, retail associations and the local government of Delft.

The problem statement for this research is: “The retailing sector is changing and many city centre shops cannot adapt to it. A platform could enable city centre retailers to be present online and improve their value proposition - but how to develop, design and implement such a platform, is unknown”
2.3 Research Objective

The objective of this research is to create an architectural design of the platform from various perspectives and an implementation strategy from a process perspective. Finally, a demo to consumers will be shown to test the design and viability. The demo has to aim to verify the design and the viability of the platform at the side of retailers and consumers. This demo with its analysis can be used for further research or business to make a more advanced version of the platform. This objective has many unknowns and challenges which need to be investigated in order to design and develop such a platform.

The final deliverable would be a prototype of the platform with feedback from retailers and customers. This prototype will be based on retailers’ and customer requirements. The technical design will address data issues like reliability, integrity and redundancy. The technical architecture will also represent the orchestration between all individual service components. Orchestration is becoming more relevant since many libraries, API’s and other platforms can be used to create a new service such as our platform. The design from the data perspective will be presented using the UML standard and the orchestration of techniques and services be will presented using the BPM notation. A more abstract view of the research objective is given below.

1. Platform requirements
   a. Benchmarking
   b. Retailers
   c. Customers
2. Technical architecture
   a. Available techniques and use of those techniques
3. Implementation strategy and business case
4. Prototype of platform
   a. Feedback on platform

It has to be noted that the list above does not represent a chronological research. The technical and process requirements go hand in hand. Process requirements has impact on the techniques and data structure while some techniques and make certain (im)possibilities at the implementation side.

2.3.1 Consumer perspective

As last, from the consumer perspective a few knowledge gaps can be identified.

- How do consumer use websites of brick-and-mortar stores in the shopping process?
- What are requirements and the expected value of consumers for the proposed platform?
- What is the consumer behaviour with respect to existing shopping platforms?

Shopping motives are already analysed in a scientific form (Heitz-Spahn, 2013). Though many empirical studies not show the behaviour in cross-channel commerce by consumers. Percentage of consumers which orientate online or offline before purchasing at a certain store are known. However, a knowledge gap is present when it comes to how consumers orientate online on physical stores in which they want to buy the product. Consumers use online and offline as separate entities in searching and purchasing. It is not within the scope of this research to fill this knowledge gap since it would require and extensive empirical study. The consumer perspective will be used to draw up requirements from the consumer side and to research the expected added value of the platform. Non-scientific sources Papers in this field of research are lacking from this research when it comes to shopping platforms and
large online retailing firms like Amazon, Bol.com or Wehkamp. A platform can be seen as a large online retailing firm, consumer motives regarding these firms are important to know before developing the platform.

2.4 INVOLVED STAKEHOLDERS

Regarding the research problem, three main different stakeholders can be identified. Within the research, these stakeholder groups will be investigated in order to make the technical design and implementation strategy.

First, the small and midsized retailers are located in city centres or shopping malls. This stakeholder group hereby suffers from the growing online retail and the new customer behaviour and requirements. City centre retailers who see a decreasing sales but have a good value proposition. (RolandBerger strategy Consultants 2013). For this research, mainly retailers from Delft will be interviewed.

The second main stakeholder group are those who have indirect benefits in the well-being of the small and mid-sized retailers. The local governments have interest in lively and attractive city centres, local economy and employment. This stakeholder group also includes other enterprises such as hotels, restaurants and bars. More people in the city centres results in more revenue for this subgroup. The third stakeholder within this group are property owners of the individual shops or shopping malls.

The third main stakeholder group are the consumers. However they are not directly affected by the changing retailing landscape, they do perform a critical role in the process. It is the consumer’s behaviour which triggers these changes and play a role in the success of the proposed platform.

The platform as proposed in this thesis is subjected to the network effect. The network effect is the effect that one user on the platform has a value to other users (Shapiro & Varian, 1999). In our cases, the presence of retailers has a value to potential customers. More retailers on the platform means that the value of the platform increases to consumers. The same accounts for the consumer, the presence of consumers on the platform has an added value to the retailer. In this case, a chicken egg problem is present. Retailers only see value in the platform if there are consumers who will buy products. Consumers will only see value in the platform if shops and products are present. Clearly, the network effect is highly present in this thesis, therefore substantial research is done addressing this effect.

2.5 SCIENTIFIC RELEVANCE

The scientific relevant of this research is present in each perspective.

Within the technology perspective, the architectural design of a service system platform is a challenge. Many different techniques, services and requirements come together and need a good orchestration in order to fulfil the “human” requirements. The alignment of the data, techniques and users is not simple. Data gathering, ontology and use is a scientific topic on its own. Service orchestration and data topics are currently lively topics within computer science. Many of these research topics are not used in applications, and especially not in applications where many different research fields come together with the notions of stakeholders and process management in mind. In short, the scientific challenge is: combining new architecture paradigms, computer science subjects and technologies into a practical implementation together with the aspect of stakeholder management.

Science is lacking is the specific knowledge of platform development. Development of platforms and networks are seen anywhere, a scientific framework can help in this. A translation from other research fields has to be made before designing the brick-and-mortar retailing platform. This translation can be
seen as an added value to science. While more and more platforms become visible on the web, not many research has been done in platform development. The outcome of the research has the potential to be applied to other sectors or geographical areas as well. Within this research rules for platform design will be used from innovation and network theory. Those rules could be used in the development of a framework for designing platforms.

Current literature is comprehensive in online and offline sales. Many theoretical and empirical studies have been done. The literature also includes empirical studies on the impact of online sales adoption by city centre retailers. On the contrary, literature does not provide a clear answer to the question why retailers adopting online strategies or not. A design science methodology has not been used yet and provides a new insights to this research topic. Also knowing why and how city centre retailers adopt new strategies gives the potential of developing new services.

The consumer perspective is also comprehensively studied in scientific literature. However, retailing is still changes and new consumer insights are can be gathered. For example, more and more brick-and-mortar shops from any size are adopting online sales strategies. The effects for these strategies have been empirical studies, the consumer behaviour and characteristics however is still unclear. These insights could be further developed by individual retailer to adjust their strategies on. More surprisingly is that role of retail platforms such as EBay or Alibaba have not been studied yet. While the market share of those platforms is growing with respectively 13% and 54% in the last year (Evans, 2014; Mac, 2014) their impact on retail is growing significantly. Researching the consumer behaviour in the offline-online setting and platform behaviour both generate need valuable insights. The added value of this research to existing literature is thus twofold regarding the consumer perspective. Firstly, the aim is to generate knowledge about the consumer use of existing hybrid shops and how this concept could be developed further in the platform. Secondly is derive strategies and rules from existing platforms on how they are setup and developed over time.

2.6 Societal relevance

The societal relevance is largely present in this research. A person only needs to open the newspaper to read about the increase of e-commerce and empty shopping streets. This transition leads to transforming city centres and it affects many people. The retail sector currently has more than 800,000 employees (HDB, 2011). The total percentage of empty shop area is 8% and growing exponential (Planbureau voor de Leefomgeving, 2013). Local governments are struggling with shops that go bankruptcy and leave an empty space in the street (Locatus, 2014). This makes the city centres less attractive which also has a negative impact on other businesses, like bars and restaurants.

A second aspect is that the platform has the aim to optimize the complete product price. Optimizing this price means a reduction of costs for consumers and retailers. These costs can be represented in money or time. A saving of these costs lead to higher welfare.

2.7 Research questions

This chapter outlines the main research question combined with the following sub questions. The questions are derived from the knowledge gaps and problem statement and will be answered in the final thesis. The questions are focussed on the small and midsized retailers located in the city centre of Delft. The questions are both from a technical and process perspective.

Main research question:
“How should a service platform be designed and implemented to enable city centre retailers adapt online sales strategies?”

1. What are the main design challenges, rules and considerations in designing platforms?
2. What are the requirements from retailers to join a platform that enables them to partly expand their activities to the web?
3. What are the customer requirements and motives regarding shopping online, offline or on platforms?
4. How to gather, store, search and present the retail data in efficient way?
5. What are the costs and benefits for retailers and the platform owner?
6. What are good strategies concerning technology and stakeholder management to increase the chance on a successful implementation of the platform?

The main information source for RQ1 is literature and desk research. No specific literature was found in scientific databases Scopus, science direct and Google Scholar when searching for keywords such as “platform/portal design”, “service platform” and “information platform”. Variation to these searched were portals, development and design. However, literature does provide valuable insights in designing platforms from network theory, service system design, two-sided markets and innovation design. Those four aspects will be used in a benchmark where multiple retail based platform will be assessed.

The main information source for RQ2 are informal conversations, interviews are literature, interviews and a survey. The literature is used to get a general understanding of problem and possibilities. Since the residence of the researcher also the research area, many informal conversations take place during this study. Findings in literature and informal conversations contribute to defining requirements and help to structure the interviews. The first interviews are explorative and used to define more specific questions in later interviews and surveys. Surveys are used to validate design choices and draw more precise and supported conclusions.

RQ3 is focussing on the consumer side. Literature is abundant in consumer behaviour in online and offline shopping. From these literature, consumer behaviour and internet strategies can be identified and be assessed on what this would imply for the platform. Less literature is present on the more practical designing of e-commerce systems, non-scientific sources will be used to asses this part. Many statistical information is available at the Dutch central office for statistics and Detailhandel.info (CBS 2011). The requirements and goals derived from the sources will be used in the design. This design will then be tested using a survey. Test-results either validate or alter the design.

RQ4 represents the technical design and is mainly focussed on data since the platform represents an information system. The technology has a strong bi-directional relation with the requirements and goals. The technology should comply to the requirements and as much as possible to the goals. A trade-off should always be made between added complexity and added value. On the other hand, certain technologies are fairly simple to implement and results in a great added value. The sources of information are thus twofold. Desk-research to search for technologies which can contribute to the platform. And design science to draw processes which comply with the listed requirements. The limitation here is that the amount of (web) techniques available today is quite extensive. The search can therefore not cover all techniques. This extensive amount of techniques is also the reason why orchestration becomes more important.

After the design and development phase, a proof of concept will be made. Tests and schemes to measure usability will be developed. The evaluation of this demonstration results in more insights is feasibility of such a platform and should give information the Research questions 6 and 7. For the implementation strategy after the selected design, a process management methodology will be used.
Having a platform design which fulfils the requirements of the stakeholders will not guarantee success. This process management methodology focusses on how, which and when the involved stakeholders must be used in order to increase success. In this methodology, a business case will be presented to show the viability of the platform.

In the last phase the main research question will be answered. Suggestions for further research will be made and interesting finds will be communicated. The flow diagram presented below is the conceptual model of the research. The diagram identifies the phases of research and shows which research questions will be answered when and with what methodology.

![Flow diagram of research](image)

**2.8 POSSIBLE RESULTS**

The design outcomes can vary from a platform which knows a high individualization of shops, to a platform shops cannot be distinguish. The outcome can also vary on the dimension in to what extent external stakeholders are involved in the platform. A third dimension would be to in what extent retailing aspects will be available in the platform, varying from displaying products only to the full sales process.

The result depends on the willingness of retailers to go online and the feasibility of such a platform with respect to technology, process management and the business case. No research has been found on the willingness of retailers to serve more retail channels by using existing platforms.
Regarding the technical aspects of data administration and service orchestration, there also exist several dimensions. The data aspects could vary from -easy to get a good database- to -the results where many challenges still need to be faced in order to get proper data-. The alignment and orchestration of services could vary from: - All available services are present and relatively easy to combine - to – Almost all technology have to be developed in order to perform the required tasks.
3 DEFINING OBJECTIVES OF A SOLUTION

This chapter represents phase 2 of Pfeffer’s DSRM and has the aim to define a solution space for the proposed platform which is derived from the problem statement identified in the previous chapter. The objectives identified in this chapter will describe how a new artefact can be a solution to an identified problem.

3.1 METHODOLOGY

The problem definition and the urge has been presented in the previous chapter. The steps performed and methodology are derived from DSRM. To concretize the problem, the objectives of a solution will be inferred based on knowledge on what is possible and feasible. It is important to know the state of the problem and current solutions and its efficacy. After this chapter we should be able to list quantitative and/or qualitative objectives of how the new artefact is supposed to support solutions to the problems. In order to do this, knowledge is needed about the current state of the problems and current solutions and their efficacy.

To define the solution space a platform, retailer, consumer and technology perspective since all of these have their own objectives and design solutions. The perspectives are chosen because they play an important role in the design. The platform perspective is used to get insights in designing platforms. Retailers and Consumer are the most obvious users of a retail platform which makes their requirements, current problems and solutions important to the DSRM. The technology is an important aspect since it is needed to know in which way the new artefact can propose a better solution and to test the appropriates and viability. These perspectives will be addressed in the coming three main paragraphs. The methodology used within each perspective is given at the start of each paragraph. An overview of the perspectives, information sources and purpose is shown in Table 2.

Table 2: Information sources per perspective

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Source</th>
<th>Purpose/goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform</td>
<td>Literature:</td>
<td>Platform specific literature is not available. Platform design elements will be derived from more general theories. The platform benchmark is used to test the applicability of the theories and to research important aspects in platform design. The benchmark will also provide insights how well current initiatives address the problem.</td>
</tr>
<tr>
<td></td>
<td>network theory</td>
<td></td>
</tr>
<tr>
<td></td>
<td>two-sided markets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>innovation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Benchmark</td>
<td></td>
</tr>
<tr>
<td>Retailer</td>
<td>Literature</td>
<td>Characteristics of firms using online/offline sales</td>
</tr>
<tr>
<td></td>
<td>interviews</td>
<td>Online sales strategies and effects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Expose barriers in adoption of online strategies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Research retailer requirements</td>
</tr>
<tr>
<td>Consumer</td>
<td>Literature</td>
<td>Consumer behaviour in offline and online commerce</td>
</tr>
<tr>
<td></td>
<td>Desk research</td>
<td>Important aspects in online sales</td>
</tr>
<tr>
<td>Technology</td>
<td>Desk research</td>
<td>Gather available technologies regarding online sales</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check feasibility of requirements and design elements</td>
</tr>
</tbody>
</table>
The main limitations of the approach is its broadness which does not allow for strong in-depth analysis of the requirements and objectives. This has the consequences of having a design which is not detailed and needs further research in order to develop it. DSRM requires an assessment of the current state of problems and current solutions addressing these problems. Considering the rapid increase of web shops (CBS, 2011), and the most recent literature found about the current state of the problem (Boschma & Weltevreden, 2008), the relevance of literature can be questioned. Though other entrepreneurs and the municipalities are identified as stakeholder, there are not addressed in a specific perspective. This has the consequences that their requirements in the design will be mitigated.

To mark the main design choices, several design variables will be presented. An example of a design variable is presented in Figure 7 where its values can be discrete and ordinal. The set of all design variable mark the design space. In Chapter 4, the design variables will be researched further and a setting will be made for the platform. This chapter will thus serve as a demarcation for the solution space of the platform, where first insights from users and experts will be used as well. This will lead to an identification of resources from a user, organizational and technological perspective.

![Figure 7: Example of a design variable](image)

From the different stakeholder perspectives we can derive requirements and goals. Those requirements and goals can be used in a later phase to measure the accordance of the platform. The aim of this setup is to select a value for each variable in such a way that the requirements are met and the goals are maximized. The requirements and goals will be marked as shown below. When exploring the design space, knowledge gaps are identified. Those knowledge gaps will be further researched in the design and demonstration phase. For overview and readability purposes, the requirements, goals and knowledge gaps are visually indicated as shown in Figure 8.

![Figure 8: Indicators of requirements, goals and knowledge gaps](image)

The gaps identified in this chapter will be further researched in the Chapter 4, the design phase. Gaps need to be fulfilled in order to make a justified design decision. Later chapters also include knowledge gaps. Where possible, these gaps will be fulfilled, otherwise it will be listed as limitation and/or suggestion for further research.

### 3.2 PLATFORM PERSPECTIVE

In order to mark the key design decisions, the platform perspective is used within this phase. The purpose of the platform perspective is to identify key components which need to be implemented in our design. The main question is: which patterns, especially in the starting phase, can be identified in
existing platforms and how can those be applied to our platform? Sub aspects like the origin, stakeholder management, and development over time, marketing and business case will be researched. For the platform perspective, a literature study and benchmark will be performed. This paragraph will provide the first insights regarding “RQ1: What are important elements in designing successful platforms?” Despite of the large amount and familiarity with platforms, not much research has been done to this aspect.

3.2.1 Literature

The literature is used as general assessment for the platform design. The benchmark should lead to more practical implications for the design. These implications on its turn could then be used in the interviews. In that way the design space regarding platform development is scoped down in several aspects. The findings from the literature could also be used to reflect upon when addressing the retailer and consumer requirements. This paragraph will be mostly based on literature and the benchmark is used to refine literature in order to apply it to this research.

3.2.1.1 Search methodology

When performing the literature reviews, first was searched for platform specific literature using google scholar and Scopus database. The results often focussed on hardware platforms such as Xbox, windows, programming languages, Blu-ray etc... Specific literature on purely it based platforms like eBay was abundant. However, the book ‘Invisible Engines’ written by Evans, et al. (2006) which focusses of the origin, evolution, impact and economy of multi-sided Platforms(MSP) in current industries from a business perspective. The book provides many useful insights for the business case and an implementation strategy. The co-author of the book, Andrei Hagiu, published several papers on platforms in the period 2004-2011. Looking further in his references, it became clear that platforms are more generally described in network theory and two-sided markets.

The papers of Hagiu have not brought many offspring in literature, but are used as inspiration source in Silicon Valley start-ups, as Hagiu states himself at a conference (Hagiu, 2012). The reason why other scientist have not built upon his literature may be due to the high similarities with two-sided markets, which is a lively subject in science. Those who do cite Hagiu mainly used his theories in case studies on existing platforms. The nature of papers by Hagiu have a business focus with many practical considerations in platform development. “Hagiu and Wright (2011), propose a new definition of MSPs that aims to capture what makes eBay, shopping malls, Yellow Pages directories, and dating websites different from “regular” firms such as a bakery or car dealership, as well as how to characterize less clear-cut examples.”

“Organizations that create value primarily by enabling direct interaction between multiple affiliated group customers.”

Within this definition, the “direct interaction” and “affiliated groups” are important. This definitions distinguishes platforms (EBay), from intermediaries (brokers) resellers (Amazon).The platform used in this research does fit the definition of Hagiu, which make the literature of Hagiu applicable.

Main limitation within this literature search is the lack of results which have a high fit to this research. The term platforms is used in many different scenarios and to describe other aspects such as standard setting platforms. Considering the wide adoption of electronically based retailer platforms, more literature describing these platforms must be present. Unfortunately, this literature was not found.
The most prominent theory used for defining the solutions space from the platform perspective remains the network effect.

3.2.1.2 Network effect & two-sided markets

As already mentioned, the network effect is highly present in the platform. The network effect is often explained using the telephone network displayed in Figure 9. The value of the network can be seen as the number of lines or connections. The value of the network depends on the number of users where N is the number of users, the value is N^2.

An important notion for business is made by Metcalfe, he states that the value of a platform grows exponential with number of clients (Hendler & Golbeck, 2008). It is stated that the value of network effect becomes significant after a number of users, this point is also called the critical mass. In human terms. Nobody will buy a telephone when there none, or not enough, other people who they can phone with. People will only buy a telephone if the value of the network is higher than the costs of buying a telephone. What Metcalfe tells us that platforms should pay attention on how to get the critical mass.

Ways of dealing with the critical mass varies. An option is to sponsor (or invest) in the early adopters by lowering the price, offer additional valuables or request friends to join. A more natural strategy is to create a system that has enough value without the network effect. Network owners should focus on those adopters who have a high value to the network.

Achieve critical mass

Two-sided market theory is a refinement of the network effect and differ on the heterogeneity of the users. Examples of those markets are dating websites, EBay, payment service providers and gaming consoles. The value of the network is for user group A is dependent on the size and quality of user group B, in our case the consumers and retailers. The investment costs of retailers and the opportunity costs of consumer should always outweigh the benefits. Clearly, the chick-and-egg problem is present. Without retailers, the platform has no value to consumers and vice-versa. To solve this problem, the costs of at least one side should be lowered or their expected benefits should be raised (Parker & van Alstyne, 2005).

Both consumers and retailers have opportunity costs, but differ over time. In the early phase of development, opportunity costs of retailers are higher than those of consumer. The consumers are the most price-sensitive side, which means they must not pay for the platform. The retailers have high investment costs, and a low expected revenue in the first phase. To solve chick-and-egg-problem, the retailer investment costs should be subsidized to a level where the investments costs are lower that the opportunity costs. The opportunity costs differ per retailer, and thus need a different subsidy. Retailers with a relatively low investment costs versus opportunity costs must be subsidized first. The pricing scheme and retailer selection based on network theory is presented in Chapter 0 and 4.6.

Implications for design
- **Obtain critical mass in a short term for both sides**
- First focus the side of the platform which adds the most value (quality)
- Opportunity costs must be higher than the investment costs at all time for both sides
- Subsidize the size with the highest pricing elasticity

Limitations of the literature are the lack of details which is needed for design science. The network effect is helpful in the development of the platform in terms of user generation, but less in specific user requirement. These specific requirement will be further addresses in the retailer and consumer perspective. In an ideal situation, literature would have provided a development framework.

### 3.2.2 Benchmarking

The aim of the benchmark study is to identify key aspect in designing multi-sided platforms. The literature assessment revealed general notions, when benchmarking, more specific rules and implication for our design can be derived. In literature, many examples of platforms are given. For the benchmark, mainly product orientated platforms are used. Since the case study is performed in Delft, some platforms in the Netherlands are also used within the benchmark. Another requirement to include platforms in the benchmark was the degree in which information about the history of a platform was available.

The platforms which have been research are EBay, Marktplaats, Thuisbezorgd, Amazon, Bol.com, beslist.nl, Google shopping, Craigslist, Atomic mall, Ecarte, ruby lane, Hyves and Facebook. The list is derived from literature and personal familiarity. Social platforms are added to the list, since they are widely known and could have interesting elements which can be used for our platform. The platforms are compared several factors which are given in Table 3.

**Table 3: Comparison factors used in platform benchmark**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Derived from</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origen</td>
<td>Network theory</td>
<td>Pricing schemes retailer selection,</td>
</tr>
<tr>
<td>Current situation</td>
<td>Network theory</td>
<td>Implementation strategy</td>
</tr>
<tr>
<td>Type of goods</td>
<td>Retailer perspective</td>
<td>Determine fit of products on consumers and Technology.</td>
</tr>
<tr>
<td>Type of retailers</td>
<td>Retailer perspective</td>
<td>Characteristics of willing retailers.</td>
</tr>
<tr>
<td>Retailer differentiation</td>
<td>Retailer perspective</td>
<td>Trade-off uniformity and added value for retailer</td>
</tr>
<tr>
<td>Type of consumers</td>
<td>Consumer perspective</td>
<td>Matching both sides</td>
</tr>
<tr>
<td>Offered services</td>
<td>MSP</td>
<td>Determine quality standard and interaction governance</td>
</tr>
</tbody>
</table>

The network effect has already been discussed and identified as an important factor in development of platforms. In this benchmark there will be a continuous reflection to the network theory. Most important aspect from literature is the opportunity costs. This mean that in all cases the potential revenue is higher than the investment costs for both consumers and retailers. Within the benchmark attention will be paid to those factors which influence the opportunity costs. Since the value of the network for one side is depended on the number of users at the other sides, these aspects will be used within the benchmark as well.
3.2.2.1 Origen & current situation

Most platforms are intentionally not designed for the purpose which they fulfil nowadays. For example Amazon, or the Dutch equivalent Bol.com, started in selling books online but became the largest shops in their country. Those organizations benefit from the principles “economies of scale” and the “winner takes all”. The same is seen with markets. Individual small shops for vegetables, meat bread etc... were overtaken by supermarkets and grocery stores.

Many platforms had a specific focus for certain product in the early phases but expanded their product catalogue at a later stage. Amazon and Bol.com initially sold books and now have a very broad product catalogue. Social networks started with students but now serve all persons, business and events.

Also EBay and Marktplaats, which focused on second hand products from a consumer to consumer perspective, changed their scope. Those platforms are currently more towards Business to Consumer. With relative easy, companies can start selling certain products online and profit from the publicity and image of those platforms. Marktplaats is still focussing on local aspects with for example the radius search function while EBay does not make a difference and opens up a whole new market for Asia. With the growth, more sides on the platform were allowed such as companies, advertisers and event organizers. From this we can conclude that sides can be added in a later stage of the development. For example, hospitality service does not necessarily have to be adopted in the initial design.

Atomic mall and ruby lane started as alternatives for EBay. Due to the oppressive power, high fixed costs and high variable costs, more resellers shifted from established platforms to atomic Mall. Atomic Mall is transparent about the pricing, 0,75% - 6.5% of the total sales with a minimum on 0,10 dollar. Product listing is free until 2.000 products. From this we can conclude that pricing and transparency is important. The low costs and freemium model resulted in gaining a high user base in a single year.

The social networks Facebook and Hyves started as a digitalized version of the face book in each High School college yearbook. From scanning of the pages, the platforms developed as pages where users could alter their own profile. Those platforms gained more users as they offered games to attracted more online visitors. With the growth more sides on the platform were added, these were: business, events, groups and games.

Almost all platforms were setup within a specified regional bound. Hyves started in Amsterdam, Facebook at Harvard, and takeaway.com in the Netherlands. Almost all platforms used specific The idea behind is very close related to the network effect. In this example we use Harvard and Facebook. The chances that people in a university know each other is very high, therefore with only a limited amount of users, the value of the platform is high. Facebook increased its starting value since it scanned the college yearbook photos. The same accounts of takeaway, which first focussed on one small city to index all restaurants.

Implications for design

- Flexible design which allows the platform to change function and/or scope
- Enhance user engagement by offering additional services in the long-term

From this, we can derive a design variable which represent the geographical are where the platform should be launched in the first phase.
3.2.2.2 Type of goods and retailers
The most retailers present on Amazon, Bol.com and Alibaba are small retailers specialized in one certain product category. With limited products and resources, it might be hard to setup your own web shop, though joining an existing selling platform allows retailers to quickly start selling online. A more recent development is that wholesalers and manufacturers of certain products sell their products directly to consumers. This development is seen with Chinese manufacturers who sell products through Alibaba and eBay. eBay and Marktplaats were setup as second-hand sales platform, their identity was that of low costs products. Due to this characteristics, retailers selling new products are often low-priced. Amazon and bol.com started in book, since those products were suitable for online sales. Price difference between online and offline was 9-16% while in books, the average price difference is 33% (Brynjolfsson & Smith, 2000). Books are quite popular to buy online since the risk costs and transportation costs are relatively low.

It is possible to distinct products in multiple ways. From the consumer perspective products can be distinguished on search costs, transport costs, transaction costs, waiting costs, risk costs and the product price itself. From the technology perspective we can distinguish products on how well they can be indexed and represent. And then of course from the network effect we can distinguish products which have a high likelihood of being searched and bought on the platform. It is not possible to pinpoint individual products but product categories are possible. Since this platform relies on participation by retailers, we can distinguishes different types of stores. By focussing on a specific shop category, the platform gets an identity and the goals and requirements will be reached in the best matter. Choosing the product types depends on the retailers, consumers and the technology. A research on which shop categories to choose is made in next chapter after each aspect has been researched.

Implications for design & implementation

- Chose products who have a high fit for the platform
- Chose retailers with high opportunity costs
- Creating identity of the platform in terms of product catalogue

3.2.2.3 Retailer differentiation
Retailer differentiation is the degree in which retailers can distinguish themselves from other retailers. This can be trough layout, text or structure. Within the existing retailing platforms, there is a difference regarding the differentiation of retailers within it. An overview of the retailer distinction per platform is given in Table 4.
Table 4: Retailer distinction per platform

<table>
<thead>
<tr>
<th>Platform</th>
<th>Distinction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon</td>
<td>None, pure reseller</td>
</tr>
<tr>
<td>Bol.com</td>
<td>Company name visible with reviews</td>
</tr>
<tr>
<td>Marktplaats</td>
<td>Product overview &amp; website links</td>
</tr>
<tr>
<td>Ebay.com</td>
<td>Own stores in standard layout, not easy to access. Distinction based on sales amount and review score</td>
</tr>
</tbody>
</table>

At EBay, retailers have their own store, at Marktplaats they have a small profile and at Bol.com they have reviews. From interviews we can generally conclude that the platform should be uniform in its appearance and not cluttered. The layout for each retailer must be the same, though retailers want to distinguish themselves from the other retailers. However consumers must be able to navigate through one specific search. It must also be a place where individual retailers can put their company profile, where pictures or videos must be present. Many complaints are heard from websites which index retailer profiles but do not update any changes like opening times. Retailers feel the need to be able to update their own profile, upload new discount offers, videos or other promotional elements.

3.2.2.4 Offered services

Within the platforms there is a lot of differences between functionalities and services. Craigslist only lists products and a search button. EBay lists products, shows ratings and provides payment services, combined with a shopping cart for multiple stores and aftersales. Marktplaats shows products within categories, applies filters and shows payment and delivery options. Choices can be made regarding this aspect and a design variable for this aspect is presented below.

3.2.2.5 Network effects & retailers

The network effect has been briefly explained, but what does this imply for the retail platform. The first method mentioned is attracting early adopters. Early adopters can be distinguished in those who want to be front runners and people for whom the value of the platform is higher than average. The front runners could be detected by performing interviews or just call people. Since a retailer would
always make the trade-off between investments cost to join the platform and the value of the platform, another options appears. Those retailers who consider their own costs low could be early adopters or those who consider the value of the platform higher.

Who are the retailers having low costs when entering the platform? This could be retailed who already has all of the required data available, like shop info and product data, or who considers joining online commerce as a low barrier. But for which retailers is the value of the platform higher? This typically needs to be found out. First insights could tell us a few things. Stores with certain firm factors that suits online commerce. Strategies targeting the early adopters will be further developed in chapter 4.

### 3.2.2.6 Consumers & retailers

Addressing both parties individually is not enough. For example you could/we look at, the telephone network. If we would say 10 people have a phone. In scenario A, those 10 people are from different families and in scenario B, they are all direct family. That value of the network in scenario B is higher for the individual people with assumption that families have a high rate of telephone communications. What this examples shows is that the consumers and retailers should be matched. In our case, a sewing shop is less likely to attract men than women. Consumers who join the platform should have a high probability of buying something at the retailers present in the network. So what increases the likelihood of users using specific products? Or in our case, which products are most demanded by users to buy trough this platform?

### 3.2.2.7 Geographical demarcation

Consumers not very likely to buy something in a city 200 kilometres away but are likely to buy something within the range of a bicycle. Obtaining the critical mass city by city is thus easier and should be focused on. This is also seen in many platforms such as Facebook and takeaway.com

Which products are the most suitable for the platform?

![Product types](image)

### 3.2.2.8 Conclusions & limitations

The network theory and two-sided market theory proved to be a valuable starting point. Many Observations in the benchmark could be explained by theory. All platforms have a different focus in the first years. These differences are in offered services, target group, size, scope and size. The choice is between designing a platform with the assumption having a large installed user base, or a design for the first phase. Since predictions are hard to make about the further use of the platform, the obvious reason seems to be to design for the first phase only. After a successful beta development and testing, a more mature design can be made. This has the consequence that for the retailer and consumer perspective, the design choices and requirements will be listed for the first phase only.

Limitation of the benchmark is that only successful platforms could be examined. Most likely there are many more unknown and/or less successful platforms. Learnings from unsuccessful platforms can be useful for our design. However, due to information availability constrains, this was not possible.
Furthermore, detailed history about the first years of development of the selected platforms was unknown. The success or failure of a platform can be dependent on the X factors, where X is unknown and can vary. It can be questioned if the comparison criteria used are complete or how relevant they are. The criteria are derived from obvious difference between platforms and some derived in the first steps of the benchmarks.

3.2.3 Similar initiatives
While performing this research, similar initiatives are found. This shows the importance of the matter and provides the ability to learn from those initiatives. These examples could also be tested to the theory. By examining trends and similar initiatives, we can discover elements which are successful or not successful.

3.2.3.1 Voradius
Voradius is a websites which indexes the products from large retail stores and attaches a location to it. When searching for a product, a list of shops is presented where this product can be bought together with distance in meters and if the shop is opened. Their business model is that small retailers can join this platform for a fixed monthly fee. The other income source is from affiliates of large retail stores give a commissions to Voradius. Voradius is scraping the products from the larger stores in the Netherlands and combines that with the location of their stores. Voradius is currently expanding their services and attracting new affiliates. Voradius did not want to provide more information about their statistics and business case.

From user reactions, we learn that Voradius is unclear, slow and the search queries yield no proper results (Emerece, 2014). Also no pictures are provided which makes the Voradius useless according to some reviews.

What can we learn from this example? Technologies allows to scrape the biggest website with actual stock ratings. The business case of this concept is promising which shows the added value of the service. From reactions we learn that search queries should provide good results with images.

3.2.3.2 The new shopping (Het Nieuwe winkelen).
Project instantiated by a governmental funded organization to make city centres more attractive. This project focusses on the integration of social media, personal ads into shopping. This initiative focussed on “enhancing city experience”. The cities who joined this initiative are Veenendaal, Arnhem, Den Bosch, Waalwijk, Alkmaar and Enschede. This concept is seeming to fail (NOS, 2014). Retailers are sceptical and state the focus is too much on technological innovations. The core of city retailers is to be friendly, help customers and have a nice looking centre. Retailers expected more revenue and found the costs too high. “Technological developments are often presented as the solution” according to Henk Gianotten, chairmen of platform: “The new shopping street”. According to Henk, atomisation and digitalisation may never be a goal on its own.

What can we learn from this initiative? Retailers are very sceptical to technological innovations and does not seem to work. The goal of the platform should focus on benefits for consumers and retailers rather that digitalization alone. Commitment by the retailers are low, in this example the platform was imposed rather than supported.
3.2.3.3 Hybrid shops

There are examples of pure digital stores which open physical stores in city centre and vice versa. Examples of formerly pure digital player are Coolblue. Many examples of physical stores who open a web shop are present. H&M (fashion), Halfords, Blokker, Praxis and many others. Clearly, both types see a benefit in being present on 2 channels. What is it for those retailers which make this a profitable strategy? The answer to this question could show where the platform has the most added value and allows us to quantify it.

As can be seen with the example of Voradius, many large retail stores provide online product catalogues and the possibility to make a product reservation. Examples of these shops are Halfords, HEMA and Praxis. For a part of the product catalogue, additional online discounts are provided. The company wouldn’t provide official information about the use of these services. From interviews with employees we can learn that shoppers use these service to reserve products with discounts, sometimes products are sold out solely through internet purchases. The other user group are those who have larger orders and find it easy that the store collects the items and the shopper only has to pick it up.

3.2.4 Conclusions platform perspective

The platform perspective have brought interesting findings which imposes implication for design and its solution space.

From literature, the most important element is the Network theory and its refinement, the two-sided market literature. The network theory shows a clear distinction between the early phases and later phases of the platform. The difference between the phases is in terms in opportunity costs for both sides while the investment costs remain equal. Retailers and consumers will only join when their opportunity costs are higher than the investment costs. By setting up special pricing schemes subsidizing the investment costs, more retailers can persuaded to join. The network value is higher when there is a better match between retailers and consumers. The technical design should be flexible in order to implement changes which are necessary for the different phases and network size.

Which factors, and in which way, influence the opportunity costs for both retailers and consumers?

From the benchmark we learned first of all that the literature describes the selected platforms accurate. However, terms as investment costs, opportunity costs, retailer selection and services need further refinements. The match of both sides can be improved by selection based on product catalogue, services and geographical location. The product fit can be rated using the consumer full transaction costs and how well they can be indexed using specific technology. The selection of offered services within the design should be based on the trade-off between investments costs and added value. The way in which retailers can distinct themselves on platform highly differ. The selection of the differentiation should be again based by a full trade-off of investment costs, retailer’s preferences and added value to consumers.

The similar initiatives was a further refinement and concretization of the literature and benchmark. What is learned that the platform should aim for high valued results on search queries without search diversion? Sites of big firms could be scraped for their products and embedded in the platform. Some big retailers also use webpages with offline pickup which shows the probability of a hybrid combination, unfortunately exact figures are not available. From initiatives used in other Dutch cities, retailers are sceptical towards technology driven changes. The focus should be on the consumer and
retailer benefits, and not on technology. A proposed platform should be supported by retailers rather than imposed to them.

### 3.3 Retailer perspective

From the platform perspective we derived the main design decisions, important elements and trade-off’s for the design. Within the retailing perspective we will reflect upon these findings from the retailing perspective.

#### 3.3.1 Methodology

The main question in the retailing perspective in this design phase is to get sketch the contours of the design solution. What is possible, and what is not? Which main barriers need to be overcome or which opportunities are present. To research these questions, scientific literature, general literature and interviews are used as sources. Retailing characteristics highly differ per country and even per country region (Weltevreden, et al., 2008). For this reason, sources applicable for the case study of Delft will be used. For general quantitative knowledge, databases such as Locatus and the central bureau statistics will be used. These database provide information on number of employees, revenue, bankruptcy, number of stores. Filters enable us to categories per region, branch and shop type.

For getting insights in the platform design from a local level, several interviews are held with retailing representative organisations. During this research several events were organized for retailers are attended, mostly within Delft, and used as information source. An overview of the events is shown in Appendix D. Within this phase, the interviews are used as clarification of the early findings from the literature study. These findings mainly refer to retailer selection, retailer distinction and their general opinion on the platforms. After these insights, a more detailed survey can be held amongst local retailers. This paragraph will provide the first insights regarding “RQ2: What are the requirements from retailers to join a platform that enables them to partly expand their activities to the web??” The total analysis regarding the interviews van be found in Appendix C. For the orientation four formal interviews were held and several informal interviews. The informal interviews are performed while visiting shops for regular groceries or while conducting the technology experiment (paragraph Technology 6.3). They are unstructured but their value to insights in significant. During the technology experiment, the experiment time was used to have unstructured interviews.

The formal interviews are held with retailers and representatives within the city centre of Delft. This region was chosen based on findings from the geographical selection based on network literature. The reason of choosing organizations above individual retailers is their ability to judge from a higher level. Mostly, the chairs of committees are chair because of reason, because they are elected as representatives and can give their opinion based on what more retailers think. Besides the retailing associations other stakeholders, or their representatives are interviewed. The interviewees were:

- Michiel Kraaieveld: chairman of the large and medium enterprises Delft,
- Joost Verhoeff: The chairman of organisation representing all organisation within the city centre of Delft.
- Marian den Boer - Delft marketing
- Yvo Sonneveld – Chair of shop association “tussen de geveltjes”.
- Arjan Steendam - Chair of shop association “De Klis”.

The interview questions can be vied in Appendix C. The interview questions were derived from the requirement, goals, knowledge gaps and design variable identified in the platform perspective. The questioned focusses on

---

28
• the opinion on the platform
• platform viability
• experience with e-commerce
• level of digitalization
• opinion on online retailing
• which other entrepreneurs should be included
• General requirements

It has to be said that all five experts were very enthusiastic about the platform. While each interview was planned for 1 hour, the shortest lasted 2.5 hours. Many more informal interviews were held with retailers, these interviews occurred by coincidence.

3.3.2 Platforms in general
Within the interviews with retailers and other organizations, their general opinion on platforms was asked to rule out negative opinions on platforms. In general, retailers are not familiar with platforms where multiple retailers working together. However, in the fashion industry there exist platforms which allows individual retailers to start online by simply hand over a list of the products they sell. The good thing about these particular platforms is that they require minimum resources of the retailer and that they can do the photography themselves. However, this platform has a limited impact on the total sales.

The principle of working together is widely embraced by retailers but in practise, much scepticism is seen. Retailers don’t want to be compared with other retailers purely based on product name and price but want to distinguish on more elements. Some retailers are working together but this is primarily based on trust and familiarity because they are located in the same street or are having a good personal contact. The cooperation is based on the mutual award. If Retailer A redirects a consumer to Retailer B, because he has a better offering, retailer B would in the future redirect a consumer to Retailer A. This is primarily based on trust. Retailers are anxious when they have no control over consumers and then competitors benefit from a full product transparency.

This completion and distinctiveness should be dealt with within the platform to remain a high opportunity costs for the retailers. From the benchmark we learn that platforms use quality checks for retailers by reviews or by having access regimes.

Design a principle on which retailers can distinguish themselves apart from product and price

3.3.3 Retailer types
From literature we have learned that retailer selection should take place, especially in the first phase. Retailer selection could be based on several factors like opinion on e-commerce, willingness, level of digitalization, product catalogue and size. These aspects were addresses within the interviews to gain more insights in these factors for the city of Delft,

Retailers can be distinguished in three main categories.

1. Small enterprises with no automation and limited administration about products and stock
2. Small enterprises with some automation and up-to-date stock and products lists
3. Large retailing enterprises
Group 1: Retailers without digitalized product information

For the first group it is quite hard to add information to the web. In Delft, most small and individual retailers have no or very limited digital information of their product catalogue.

“On Friday I check which watches and clocks I have sold, and then I just reorder the same.” – Tjan van Loenen

The solution could be to ask the retailer to invest time in digitalizing the inventory, or it can be done by the platform owner. In all cases, the time and money spent by the retailer and platform owner should be minimized in order to reduce investment costs. Derived from network theory, the investment could be subsidized by the platform owner. From the principle of orchestration, all information is already available. Instead of digitalizing the stock, a check on internet can be made if it is already done by searching on the product number (EAN). A quick scan yields that many EAN database exists and have public API’s.

Maintain low investment costs of Retailers by developing efficient techniques and or by subsidizing.

Group 2: Retailers with digitalized product information

For the second group, the EAN codes and product names/brand are already available.

“Every retailers with a more advanced POS system than a grey CASIO, has an partly digitalized product catalogue” – Arjan Steendam

“I currently have three web shops, one is a particular brand web shop, the other is my personal web shop and the third is in cufflinks.” – Arjan Steendam

The process would very much look like group 1 but with the addition of supplying the own information per individual item or total lists. Ideally, an integration with the product management system should be made.

Group 3: Large retailing enterprises

Large enterprises are not cooperating on a local level. It is unlikely that they will cooperate in the platform. However, large enterprises have a substantial part of their inventory online. Looking at the big warehouses in Delft like HEMA, V&D and C&A, all product information is already made available online. Techniques must be used which can gather this data in an efficient and reliable way. Retailers stated in interviews that they don’t want to be suppressed by the large product inventory. Another aspect is that the platform should show the person behind a single shop. In that way retailers can distinguish themselves.

Make the platform suitable for small non-digitalized retailers to big corporates

Willingness to participate

Despite of having the best design of a platform, it will not succeed when retailers are not willing to participate. By having taken many interviews, the willingness of retailers to join the platform is researched. Basically the retailers have one main goal and that is keeping their business continuity by having enough revenue and limited costs. In the Startup phase it is not possible to give guarantees about expected revenue. However, in Delft there are 3 main organization who invest in these kind of initiatives. The municipality trough Delft Marketing, Foundation of City centre management and the entrepreneurial fund. In other cities, the same structure is seen. These funds could be used to cover the development and set-up phase and generates trust.
“Retailers want to step on a riding train which gives them more revenue or prevents further damage” – Michiel Kraaieveld

Create commitment at the retailers. Retailers should contribute in terms of time, resources and money to the platform.

3.3.5 Pricing schemes
As derived from Network theory, two-sided market and MSP literature, pricing schemes are an important element. Goal in this phase is to explore to potential of the various pricing schemes. Since entrepreneurs are focussed on revenue and costs, a commission structure based on each product sold is the most viable option. The expected revenue is unclear but is related to the amount of product views on the platform. If the variable costs are dependent on the views, retailers are more likely to invest. This commission basis is also used in other platforms like EBay and fashion selling platforms. This option would require that the goods sold on platform can be monitored.

Monitor the amount of goods sold and/or viewed by the platform.

3.3.6 Consumers
From interviews with the retailers, different consumer types can be distinguished. The two main groups are people visiting Delft for a day or who are coming from Delft or nearby. The second distinct elements are the fun-shoppers and run-shoppers. More distinctive elements are spending pattern and loyalty. Retailers estimate that visitors and citizens both have a share of 50% of the income for the retailers. Delft is a touristic city, this explains the high percentage. Day tourists should have the ability to taste the atmosphere of Delft and orientate of the different shops and local residents want to check product availability. What we can derive from this statement are different consumers which require a different service.

Create a platform which is suitable for the run-shopper, fun-shoppers and day tourist

3.3.7 Other entrepreneurs and events.
The complete product price, which was presented in the first chapter, is as an important starting point for why this platform has potential. An additional value of the city centre retailer is the experience. A very important element according the Retail experts is to focus on the experience. However, the web is limited in exciting senses. Where the web only excites on visuals, the city centre offers more; hearing, sensing, tasting and smelling. This can be in form of music, touching products, bars and restaurants. So compared to this the web only offers few options to the senses of humans Ways have to be found on how to add the added value of city centres in the platform.

In the preliminary interviews suggestions are made by retailers to integrate the added values. The suggestions included:

- suggestion is made by a retailer to add video’s to the platform
- Make combination offers with bars, restaurants, cinemas and museums
- Marketing together with (music) events.

In this way, the platform can emphasize on what the added value of the city is. For example bars and restaurants, atmosphere and the social aspect. Retailers suggesting video’s since this shows more of the city vibe than picture alone. Also focus on the persons and service in the platform. On the company profiles, the persons behind a shop should be made visible. Problem is that a cup of coffee stays offline
and is thus hard to include in a digital platform. A suggestion in the interview from my side was to offer
discounts. Retailers tend to have an adversity toward discounts. The city retailers should offer more
for the same price, so the discount is given in providing complementary products.

The platform should focus on getting more customers to the city centre

“I don’t mind who or what is available on the platform, as long as it generates more
traffic in my shop” – Yvo Sonneveld

The interviews with retailers revealed that they already work together with other types of business.
For example, if you buy a product at the optics you get a coupon for a free coffee and pie for 2 persons.
Some clothing shops sell pastries from the local shop in their store. Another example is that you can
get a 15 euro coupon for a Greek restaurant if you buy something several large DIY and hardware
stores. The rationale behind this concept are multiple:

- Generating more customers, who attract even more customers
- Creating familiarity with their business
- Retailers see it as additional service

The local bars and restaurants all acknowledge that their customers do not solely come to their
business to drink something, most of the time, it are passers. Less passers means less customers.

Currently the cooperation between the bars and retailers is based on familiarity and trust. New
entrants have a hard time getting into this network. Some bars and retailers do not which to cooperate
due to a lack of begrudge or because they share the same type of consumers.

Consumers are not interested in small offers.

“People do not visit my place, just for one free coffee, but my margins are not high
enough to offer more” – Leon Korevaar

The margins of an optician do allow to provide a coupon worth of 9 euro’s. Also a discount of 15 euro’s
in a restaurant is allowed considering the margins. Retailers and Bars send each other a bill each
month. The average use of the coupons are varying between 20 and 200 per month.

The combination seems to be an opportunity by the platform. There are various ways of embedding
this in the platform and differ per type of shop or hospitality service, mainly depending on their
margins and cooperation willingness. Potential options are either coupons with high value, loyal-tee
program or surprise. Surprise means that customers have a certain chance of winning a coupon.
Advantages of this surprise methods are the incentive to buy on the platform and generating
marketing.

Regarding the hospitality, a few considerations have to be made

- Implementing physical or digital coupons?
- Implementing loyal-tee program?
- How to facilitate cooperation?
- Financial settlement?

More important to address this issue is the opinion of the hospitality providers. For this reason
interviews are held with these organisations. The results of those interviews are presented in the next
Chapter.
3.3.8 Embedding city centre experience

Compared to online retailers, the local retailers have more to offer. This has mainly to do with experience. On the web, only one sense is used: visuals. Local retailers use all five. Experience is a broad term and include:

- Other visuals
  - People
  - Events
  - Sightseeing
- Smell
- Sounds
- Attractive shop
- Helpful retailers
- Many shops within reach
- Bars and restaurants.
- Events

It is of great importance that an indication of the city experience can be adopted in the platform. The platform should attract people to come visit the centre instead of functioning as a web shop.

“The power of a shop is the entrepreneur behind the shop, you have to show that.” – Michiel Kraaieveld

Goal: embed city shopping experiences in the platform.

3.3.9 Retailer distinguishability

From interviews we get contradicting information. Some retailers which to have their own space in the platform which practically makes is a private web shop, while others say that the design should be uniform in order to avoid a messy look. Furthermore the look and feel of Delft should be adopted in the platform according to retailers. However, the aim of the research is to make a generic platform design for city centre retailers. A suggestion is to make a design dependent on the selected city.

Retailers wish to have their private area on the website. This should include contact info and their product catalogue. They generally want to have the ability to see their own shop. This is seen as a reward and proud that there business is online well presented. Retailers tend to distinct themselves from others. Some retailers wanted to alter their layout while others want possibilities to manage their profile like the Facebook method.
3.3.10 Effort to put into the platform

All retailers were asked to in which extent they wanted to put effort in the platform. A high variation was observed in the answers. The general conclusion is that retailers are not willing to invest in this platform unless it is proven what the returns are. This is a very important notion for the platform and requires further investigation. In the later performed interviews and survey’s, this question was asked. Another possibility is that the platform owners does the work for him, this aspect should be considered in the business case. Retailers often do not have the expertise or knowledge to perform certain digital tasks.

“The more active retailers are currently spending 1 day per week on online visibility or even hired personnel to do that. A common practise for many retailers is that they ask their children to update the website and Facebook page” - Joost Verhoeff

“The platform owner should do everything which is essential to that platform, the rest you can leave up to retailers” – Michiel Kraaieveld

So far, three main findings determine the balance of efforts

1. Investment costs should be lower than the opportunity costs
2. A uniform display of products is necessary for consumers
3. Retailers often do not have the right skills to index their product in an efficient and high quality way.

The three findings suggest that a lot of effort must be placed at the platform owner, and not at the retailing side. Or, tasks performed by retailers must be check on quality by the platform owner or embedded in the design. A very important aspect is to determine the capabilities and available time at the retailers.

How much time do retailer want to spent on improving or updating their online presence

3.3.11 Main learning from the Retailer perspective

Platforms are received as a viable option. Platforms require more collaboration and less ways to distinguish, this yield sceptics. This distinguishable elements is important to embed in the platform. There are 3 retailer types who all have their own characteristics and shortcomings in digitalization. Many retailers do not have digitalized information or web presence. The design must fit to those non-digitalized retailers and to the bigger firms with full digitalization.

There are three different consumers, day-tourists, fun-shoppers and run-shoppers who require different services in the platform. Main focus of the platform should be to generate more traffic at the stores. Small and midsized retailers located in city centres offer more than product names and images.
Those extra elements should be adopted in the design of the platform. A uniform layout is important to consumers, but there must be the possibility for consumer to view individual shop info.

Retailer will join when they expect a higher revenue than investment costs. Retailers must be convinced of the opportunity costs and investments costs should be minimized. Further costs should be dependent on the added value, this results in commissions based pricing structure. Retailers often do not have much digitalized information available nor do they have the ability to digitalize their product catalogue. To maintain a uniform layout and limit investment cost, the platform owner should play an important role in the product indexing.

The city centre has more to offer than products, it’s about service, the entrepreneur itself and for example the bars and restaurants. Though webpages do not allow other sense stimulation, ways have to be found to show the city centre experience. Embedding other entrepreneurs is a nice to have, but how to do that is yet unknown. To investigate this, interviews with other entrepreneurs will be held.

3.4 CONSUMER PERSPECTIVE

The consumer perspective in this phase is used to determine consumer wishes and requirements. The main information source in this chapter is literature. Many scientific and non-scientific research is present on the behaviour of consumers. The insights from the consumer literature is used for the design and used in chapter 6: validation. The identified platform related theories are reflected.

3.4.1 Methodology

Literature does not provide clear answers about consumer preferences in hybrid combinations. Literature either focusses on online behaviour or offline behaviour. Literature which does asses both worlds are focused on how consumers use internet before purchasing online or vice versa. No studies have been found which show the use web-shops of a specific shop before visiting that shop. Literature seemed not have a proper fit on the problems. The application of the network theory will provide insights in customer management and the implementation of the platform.

Literature was searched in database with queries which consisted out of the words: consumer, behaviour, motivation, online, offline are used as search query. In the literature assessment, it became clear that consumer is different in each country (Centre for Retail Research, 2014). The purpose of this phase is to investigate possible design solutions. To comply with this purpose, more practical, non-scientific, studies are used which give practical information on how to design and operate e-commerce websites.

While having various conversations with consumers about this thesis, an interesting note was found. Retailers believe that consumers are not visiting their stores and return home, while consumers say that will do that. There are quick-shoppers in city centres which purely want to buy a product. While consumers want a focus on the product level, retailers want a focus on their shop image. How to deal with this needs further investigation in Chapter 4.

3.4.2 Limitations of Literature

By performing the literature research regarding the consumer behaviour in online and offline retail, the contours of the platform can be sketched from the customer perspectives. Literature provides many (empirical) studies in consumer behaviour from offline perspective and online perspective. The literature only describes consumer behaviour for either online or offline retail. The platform focusses on a hybrid solution between those two worlds, therefore the literature is not accurate in describing
our case. Though, the available resources regarding the consumer behaviour in the online and offline world lead to insights which are useful for the design of the platform.

Though this research aims to get generic results for this particular research problem, the focus is mainly on the Netherlands. Scientific literature is available regarding consumer motivation but this literature might not give reliable information for the Dutch case study. To prove this point, Figure 15 is presented, which shows a high variance in the online retail shares in Western Europe countries. Though the Netherlands is almost the average Western Europe country in online retailing, I assume that general online retail research is not representative for our case study.

![Figure 15: Online retail share per home market](image)

It has to be said that something can be learned from the high differences between retail shares. One could argue that this is due to national factors like culture, geographical layout, internet accessibility or infrastructure. The study performed by (Centre for Retail Research, 2014) shows the factors mentioned are have no significant influence. The difference between regions within a country also show a difference between online retail shares. Presumably the regional layout is of influence on the consumer behaviour regarding online or offline shopping. If this is the case, one could argue that our platform design case study in Delft is not even representative for the Netherlands. Ideally, a segmentation must be made regarding regional layout in terms of city centre sized within a certain regional area. Though, this segmentation is not made since the scope of this study to focus on the technical design, actors and implementation. Also the time necessary to perform this segmentation process is high compared to the research scope. Choosing Delft as Case Study is a limitation of research when it comes to generalization of the platform design to other cities, regions, countries or continents.

Since it is shown that consumer behaviour is geographical dependent, the literature used for this case study should be representative for the geographical area of the case study in Delft. Weltevreden et al. (2006;2008a;2008b) published several survey based papers on consumer behaviour in online and offline shopping. The best study found is performed by Intomarkt Gft. Commissioned by Post NL, the
largest package distributor of the Netherlands. This study is the most recent, relevant and combines many different researches together with additional surveys amongst consumers.

### 3.4.3 Consumers and the network effects

As mentioned earlier, the network effect is strongly present. But how does this relate to the consumers. Focus should be on gaining the critical mass and ensure a high probability that the present consumers will buy at the present retailers. The participating retailers and present consumers on the platform have a high degree of interplay since the platform derives its value from the fit of the retailers to the consumers.

By looking into the critical mass further than just having a certain amount of consumers, the behaviour of those consumers influences the critical mass as well. With new services and innovations, different types of consumers can be identified: innovators, early adopters, early majority, late majority and laggards (Chesbrough, 2008). The same principle of the balance between opportunity costs and investment costs also accounts for consumers. Investments costs are the time and effort to find and search on the platform, thus those costs must be minimized. The opportunity costs are dependent on the number of retailers which offers the products they are searching for. To have higher opportunity costs, the match between joined retailers and consumers must be high. For example, having mostly males on the platform and only fashion retailers does not provide a good match.

To accelerate the user base, the focus must be on the innovators and early adopters. First versions of the platform should be focusing on those retailers and consumers who belong to these groups.

Which consumers and retailers are likely to first have interest in using the platform?

### 3.4.4 Online consumer behaviour

To start with general facts and figures. 46% of all consumers say that they shop online, where 8% always shops online. In the problem description it is stated that the trends in online shopping are of greater importance that this snapshot.

The main question from the consumer perspective is what consumers motivates to shop online and how can we implement those motivations in our platform design? Table 5 shows the main motivations for consumer in the Netherlands in 2013.

*Table 5: Consumer motivations to shop online: (Intomart GfK, 2013)*

<table>
<thead>
<tr>
<th>Ease</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>No lugging, but delivered to home</td>
<td>Quick comparison on price, quality</td>
</tr>
<tr>
<td>No parking fees and parking stress</td>
<td>(reviews) offer</td>
</tr>
<tr>
<td>No social stress; busy kids / partner who</td>
<td>Costs less time and energy compared to</td>
</tr>
<tr>
<td>do not want etc.</td>
<td>shopping in bricks</td>
</tr>
<tr>
<td>No annoying fitting rooms</td>
<td>Act in accordance with purchase goes</td>
</tr>
<tr>
<td>Avoid the bustle in cities and shops</td>
<td>smoothly</td>
</tr>
<tr>
<td></td>
<td>Every day, 24/7 (outside shopping hours in</td>
</tr>
<tr>
<td></td>
<td>order) available</td>
</tr>
<tr>
<td></td>
<td>Speed is nice considering family bustle</td>
</tr>
<tr>
<td></td>
<td>work, social obligations etc.&gt; time gain</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wide offer</th>
<th>sharp Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Everything can be found / bought online</td>
<td></td>
</tr>
</tbody>
</table>


Regarding the “ease” considering the proposed platform, the added value to the existing online shopper is limited. Though, this section could be addressed when making the final design. The speed benefits indicated by online shopper are highly present on the platform and mainly have to do with limiting the search costs. The wide offer is typically something which is seen in web shops. Bol.com or Amazon provide a very broad range of products and for example kabeltje.nl only sells cables. Combining al shops within a city centre does give a very broad product range. Interesting is to see that in the category sharp price the word “perception” is used. Earlier researched shows that’s the price-difference between online and offline shops is not significant.

Overall we can conclude that the proposed platform foresees in most of the consumer motivations when it comes to (online) shopping.

3.4.5 Online Satisfiers

Online satisfiers are elements which consumer rate as desirable. The same satisfiers could be useful for the design of our platform. The elements are derived from the study conducted by intomarktGtk. Figure 16 shows the important consumer satisfiers for online retailing in the Netherlands. A requirement for the platform is to display product price, correct information, high quality images and brand.

<table>
<thead>
<tr>
<th>Satisfiers</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>clear information about prices and conditions</td>
<td>69,00%</td>
</tr>
<tr>
<td>attractive return possibilities</td>
<td>69,00%</td>
</tr>
<tr>
<td>detailed product information</td>
<td>61,00%</td>
</tr>
<tr>
<td>label for trustworthy webshop</td>
<td>61,00%</td>
</tr>
<tr>
<td>high quality images of products</td>
<td>61,00%</td>
</tr>
<tr>
<td>advanced search options like brand</td>
<td>55,00%</td>
</tr>
<tr>
<td>good image</td>
<td>44,00%</td>
</tr>
<tr>
<td>customer service by phone</td>
<td>41,00%</td>
</tr>
<tr>
<td>presence of reviews</td>
<td>35,00%</td>
</tr>
<tr>
<td>physical shop besides online</td>
<td>16,00%</td>
</tr>
<tr>
<td>other</td>
<td>3,00%</td>
</tr>
<tr>
<td>gift wrap</td>
<td>2,00%</td>
</tr>
<tr>
<td>mobile website</td>
<td>2,00%</td>
</tr>
</tbody>
</table>

Figure 16: Satisfiers in web-shops (adapter from Intomart Gtk 2013)

Gather product names with prices is achievable, the gathering of high quality images and detailed product information less achievable. To acquire high quality images, they must either be found on the web or made by professional photographers. Photographers however are expensive and the process
becomes more time consuming. This makes the challenge for the design even harder to gather good images.

The satisfiers attractive return possibilities, label for trustworthy web shop, customer service by phone, physical shop are all evident that they are present at city centre retailers. The fact that four satisfiers are evident at the platform, speaks for potential of the value.

The presence of reviews could be considered in the final design. In the example of eBay, reviews play a very important role. The trade-off is added value of review versus the added complexity. Question is why reviews for shops are important? If reviews are there for information of lowering the risk costs? A mobile website seems not necessary.

According to the same source. 11% of all purchases online were not deliberate and can be considered as impulse shopping. Impulse buying could be an added value to the platform since consumer at home can make impulse purchases, which they wouldn’t have done if the platform wasn’t present. The trade off in this case is the added value of impulse purchases versus the added complexity of making purchases possible. Making a reservation for a product is less complex, but does make the impulse purchase definitive which lowers the effectiveness.

3.4.6 Online Dissatisfiers
Selling no is the biggest dissatisfter when purchasing online. This happens when the product is not in stock and delivery times are longer than expected or when the product cannot be delivered at all. Web shops are optimized and automated which makes accurate stock levels possible. Maintaining an accurate stock level for the city is more complicated. Assuming that most small-midsized entrepreneurs do not have accurate stock levels, an integration of system is not possible. Even if integration was possible, this would still require a lot of effort. Either stock levels must be accurate or consumers must know that they are not accurate. An intermediate solution is that consumer can request the stock levels through the platform.

Consumers must know that stock levels are not accurate and must have the ability to check this with the retailer.

3.4.7 Important elements
Different from satisfiers and dissatisfies are the key elements which make people purchase a good or not. An overview of the most important factors in the purchasing decision are shown in Figure 17. As already derived from literature, for each function a trade-off must be made between the added value and the investment costs. The elements are derived from e-commerce literature and may thus not fully apply to our platform.
Implications of adding each element costs extra time by the retailer and/or platform owner. The price may change over time and thus needs to be updated when necessary, here a potential data reliability issue is present. Images are very important for consumers, so did the retailers stated in the interviews. Images taken by retailers or the platform owner require many resources, retailers stated that images could either be requested at the suppliers. From own research we know that images could be retrieved from the web without legal consequences.

### 3.4.8 Offline consumers

Less research seems to be done on why consumers buy offline. While performing informal interviews during the writing of thesis, few findings are made. These informal interviews mostly took place when people asked me about this thesis. This always resulted in an explanation of the platform and a discussion regarding about the consumer perspectives. By also addressing the online motivation, a complete motivation model can be derived. The platform could then be designed based on this model.

- Fun-shopping (experience)
- Run-shopping (Wait costs)
- Need multiple products
- Trust (risk costs)
- Additional service
  - TV installation
  - Explanations

> “Online stores are perceived as having competitive disadvantages with respect to shipping and handling charges, exchange/refund policy for returns, providing an interesting social or family experience, helpfulness of salespeople, post-purchase service, and uncertainty about getting the right item.” - Kacen, et al.: (2013)

### 3.4.9 Online consumer research limitations

Many assumptions are made regarding the consumers perspective when looking at online consumer behaviour. Results are rated using other web shops as benchmark. Consumers say that some elements such as shipping time and return policies are important when making the purchase decision. These factors are compared to other online shops where shipping times differ from 1 day to several weeks. In the proposed platform, the shipping time varies between 15 minutes (pick up) or several hours (local delivery).
We simply do not know how consumers will rate the service of the platform. Therefore tests need to be made in order to investigate the consumer preferences. These tests will be performed in Chapter 6 Demonstration & evaluation.

3.4.10 Target group

Now that we have identified motivations for offline and online shopping, general conclusions can be drawn up. Identifying the target group is essential for the development of the platform. From the consumer price perspective we can identify the following potential customers:

- Customers who have limited time and now can find their products in limited time (search costs)
- Consumers who want the ability to easily return their products. (transportation & risk)
- Consumers who thought buying online was cheaper (product price)
- Consumers who need their product immediately (wait costs)
  - A Leaking crane
  - Presents for the birthday celebration this evening
  - Things for the vacation tomorrow.

From consumers literature regarding online sales

- Consumers who prefer to shop in the evening on their tablet
- Impulse buying

From the perspective of city retailers:

- Consumers who need additional service like installation, explanation or information
- Come for one product but buy additional products

3.4.11 Main learnings from the consumer perspective

From literature we conclude that the investments costs of consumers must be lowered and the opportunity costs must be raised by providing quick access, accurate query results and high value additional services. To improve the opportunity costs, there must be a match between the retailer and consumer characteristics. Shopping behaviour strongly differs per country and current literature does not embrace hybrid shopping behaviour, this makes the literature less applicable.

The most important satisfiers in online shopping such as attractive return possibilities, label for trustworthy web shop, customer service by phone, physical location are present at offline shops, this shows the potential of the platform. Compared to web-shops, physical shops have a worse value proposition regarding "ease" factors such as lugging, parking, social stress and bustle. To increase the value of the platforms, additional services focusing on these "ease" factors can be adopted.

The most highly rated attributes in online product display are price, product info, images and brand. Images require many resources and prices change over time, this has implications for the design and investment costs. The potential customer group are those who encounter high search, transport and wait costs. From literature we can derive that extra sales can be generated by longer opening times and impulse purchases.
3.5 Technology perspective

The technology perspective within this phase is of limited value. This section sums up the implications for the technology use derived from literature and the interviews within the consumer and retailer perspective. From literature we can derive that the technology should focus on increasing opportunity costs and lowering the investment costs for retailers and consumers. Derived from the retailing expert’s interview the design objectives for the technology should be such that retailers with less digital skills can get the product data in an easy manner. The retailer who have some product data should easily transform their data into useable and valuable data for the platform. Large enterprises will not cooperate with the platform, therefore techniques must be developed who acquire the data from their websites automatically. The web crawling techniques together with semantic web technologies have been improved over the last years and are currently one the most discussed topics by scientific researchers.

From interviews we can conclude that many retailers have no digitalized product catalogue and are in most cases not very skilled with computers. Furthermore, the have limited time of indexing their products and above all, have no skills in making professional images. Correct product information including images is essential. Possible techniques are; manually entering product names and description, semi-automated and fully automated.

3.6 Business case

A requirement of a platform that it is durable in terms of money. The platform requires a high investment to build and relatively low maintenance costs due to the economies of scale. The maintenance costs should be covered by those who benefit from the platform, the retailers and consumers.

From interviews we can conclude that retailers see an advantage in the platform but are not willing to individually invest. In most cities in the Netherlands there are funds reserved for these kind of product. A generally accepted structure is that the tax on real estate is put into a fund from where the entrepreneurs can decide how the money should be spend. This fund is generally called ‘the entrepreneurial fund’. Besides this fund, there are also city marketing funds, city centre funds and retailing organisations. On the long term, the platform should be self-sustaining.

To make the platform sustainable, a few options are possible. Fixed fee, pay for additional services, commission per product or the platform could offer external services where it get its income from. Of course, a combination between the four options is possible as well. To investigate which options are most suitable for the platform, several interviews were held.

**Fixed fee:** Since the platform has not proven itself yet, entrepreneurs are not eager to pay a fixed fee to the platform.

**Freemium:** retailers have two options, they can input and maintain all the data themselves, or they can pay the platform owner to do it for them. The platform owner is able to do this process faster due to training and makes sure that there is more consistency between shops. The same goes for the maintenance. When the decision is made that retailers are able to do it themselves, this implies that this has to be developed as well. The downside of this is that data integrity cannot be guaranteed, except if checks and balances are introduced as well.

**Commissions:** A commission structure is most seen in other platforms like EBay, Bol.com and Amazon. The commission ranges between 7-15% of the total consumer price. The survey held amongst retailers,
has shown that retailers are willing to pay this commission. For the design this implies that either sales through the platform can be monitored.

Pay per view/click

A common practise in advertising is paying per click or view. This is a more complicated solution but could be favoured by retailers. In the interviews we noticed that this option is popular. Though, this brings more competition in the city centre which is not necessarily a good thing since this may harm the relations amongst the several retailers.

Additional services

The platform owner can somehow monitor the sales made. It has to be attractive for consumer to pay through the platform and not at the retailer. This can be made more attractive by giving discounts or giving other benefits, like discounts at nearby bars or restaurants and free parking. This has the advantage that impulse buying is stimulated. The disadvantage is that the platform and organization becomes more complex since there has to be a lot of coordination between the bars and retailers and a financial distribution amongst the different stakeholders. For example, if you buy a product through the platform, you will get a free drink at a bar nearby. The consumer buys the product somewhere in the 24 hours of the day and receives a coupon for both the product and discount. When picking up the product the consumer hands over the coupon to the retailer and gets the product. Next, the consumer goes to the bar, shows the coupon and the product and gets the drink.

Normally this costs around 2 euro’s. The margin on the product must be high enough to cover this additional cost. Furthermore, there must be benefits to the platform owner, retailer, consumer and the bar. For the first three stakeholder mentioned, the benefit is clear. The benefit of the bar is familiar with their business, attractive terrace and consumers can buy additional drinks or snacks.

City benefits

From interviews and desk research we learned that there are many funds which finance these kind of initiatives. This can be the entrepreneurial fund, the local retailing associations and municipalities. Though this type of funding doesn’t seems to be a sustainable business case, it is an option to partly fund the project. These parties currently invest in street lighting, flowers, events and art in the city. The funds are stocked from tax and fees for the entrepreneurs.

3.7 Legal requirements

Special laws have been made for web-shops. It’s evident that the platform should live up to fulfil those requirements. Complying with the legal requirements comes with multiple issues. For example, for an online purchase the “return without a notice” period is 2 weeks. When a consumer bought something trough the platform, and returns it to the retailer, the refund has to be paid to retailer as well.

As mentioned before, using web-semantic and web-scraping techniques we would be able to automate shop and product indexing. Using data from the web is not always legal. When using these technologies attention must be paid to the legal aspects. The exact laws depends on the design, therefore the legal issues will be further discussed in the design chapter.
3.8 CONCLUSIONS ON DESIGN SPACE

For the first time we are able to sketch a general overview of the platform. The different perspectives are strongly interrelated and requires an integral assessment. This paragraph will show the main learnings from the perspectives, interrelation between them and which implications they have on the final design. The aim of the paragraph is to provide an overview on what is learned, what will be used in the design and what needs further design research.

3.8.1 Main learnings

Network theory and two-sided market literature proved to be a valuable source for defining the solution space. These theories could be applied well to this platform design research and was used in the platform, retailer and consumer perspective. Unfortunately the most applicable research, performed by Hagiu, was found in a late stage. The parallels between the translation of network theory and platforms have many similarities. The literature was the most prominent source in the platform perspective and learned the following key components:

- Opportunity costs must be higher than investment costs
- Platform value is dependent on the number of customers and retailers present
- Early adopters need to be subsidized to lower investments costs. This can be financial, or by investment of the platform owner or by providing special conditions
- Develop the platform in phases, as customers and retailers grows, trade-offs will change in time.
- Focus on the side which gives most value to the network
- Make sure there is a match between present retailers and potential customers.
- Enable commitment from retailers

The benchmark allows us to concretize the above mentioned learnings and gave many practical consideration for the design phase.

- On which geographical scale should the platform focus on in the first phase?
- Which product/retailer types are most suitable?
- Flexible design which allows the platform to change function and/or scope

Within the retailing perspective interviews were used as main source and had to aim to get a first overview of their requirements and the viability of the platform. The first learning from literature and the platform perspective were used to structure the interviews. It showed that the platform is viable in terms of retailers’ willingness to join, willingness to pay and opportunity costs. Main learning for the design are:

- Pay per view/sale is most viable since the platform isn’t proven on its value. This requires a design which monitors the platform value
- Embedding city centre characteristics is important, however hard to embed on a web page
- Agreements with hospitality providers are desired but add complexity to the design
- Investment costs and opportunity costs differ per retail/product type
- different consumers require different design

From the consumer perspective, mostly non-scientific, but trustworthy sources are used. Scientific literature was not able to provide accurate information. The main information source were studies which focusses on the consumer preferences and motivation in online shopping. These findings were reflected on our platform design and resulted in the following findings:
• images and price important, but hard to retrieve and make reliable
• Value proposition of offline shops are per definition high
• Additional revenue for city centre retailers
  o Consumers which not knew the shop
  o Consumers which rate search costs high
  o Consumers which rate wait costs high
  o Impulse purchases
  o Longer opening times

3.8.2  Design challenges
From this phase we can already identify a few important challenges. Main complication is which aspects should be performed by the platform owner and which by the retailer? There is a paradox between commitment, investment costs and data quality. Less investment by a retailer means their commitment is low and they rate the opportunity costs low as well. When the platform owners performs the indexing, the data quality is high. This design choice is different per retailers since they all rate their opportunity and investment costs different due to their firm and personal characteristics. The choice is also dependent on the technology use, how easy is it to use the technology and how reliable is the data outcome?

Retailers have the desire to distinguish themselves in many ways from their competitors. On the other side, literature and interviews show that a uniform design is desirable for consumers. Another challenge is on which services the platform should fulfil. The services can range from viewing product/company info to local-local delivery. Retailers have stated that their focus would be to gain more traffic in their shops, while consumers rate more advanced services as high valued.

Each function within the design requires an investment and involves an opportunity. The costs usually lie at the retailer or platform owner and the benefits at the consumer. For example, showing individual product information with images requires a large investment, but consumers see this as a benefit. Whether the setting of a design variable has a positive effect on the opportunity costs, is unknown. Assumptions for defining the variables settings must be based on the trade-off between investment costs and increased revenue due to this investment.

3.8.3  Knowledge gaps
For the design and development phase, different knowledge gaps have to be addressed before determining the design. An overview can be seen in Table 6: Knowledge gaps per aspect per perspective. For the identified knowledge gap, new literature sources are not available since this research is entering a phase in which new elements have to design. Where possible, literature will be used as fundament or reference point in the decision making process. Other information sources will be interviews and surveys. Each element requires a trade-off, and each trade-off has to be judged based on how it will create the most value for the different stakeholders. These knowledge gaps will be addressed in the next chapter at each design variable. For each design variable, the trade-offs explained in terms of requirements, goals and considerations. Design choices are not represent a fixed choice for a long time, but must be able to adapt when the platform and network evolves.

| Table 6: Knowledge gaps per aspect per perspective |
| --- | --- | --- | --- | --- |
| Element | Platform perspective | Retailer perspective | Consumer perspective | Technology perspective |

45
<table>
<thead>
<tr>
<th>Geographical demarcation</th>
<th>Where is network value highest? Match, opportunity, investment</th>
<th>Which region has the highest value for the platform?</th>
<th>Which region has the highest value for the platform?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance efforts</td>
<td>Which retailers have lower investment costs</td>
<td>Which retailers have higher opportunity costs?</td>
<td>Which technologies can be used to lower investment costs and improve opportunity costs?</td>
</tr>
<tr>
<td>Retailer differentiation</td>
<td>In which way do retailers want to distinguish themselves?</td>
<td>Best layout for different consumers?</td>
<td></td>
</tr>
<tr>
<td>Product types</td>
<td>Highest value to platform?</td>
<td>Most valuable for consumer?</td>
<td>Product best index able</td>
</tr>
<tr>
<td>Retail types</td>
<td>Match</td>
<td>Lowest investment costs</td>
<td>Most valuable for consumer?</td>
</tr>
<tr>
<td>Process steps</td>
<td>Complexity?</td>
<td>Investment costs versus opportunity</td>
<td>Desirability?</td>
</tr>
<tr>
<td>Information detail</td>
<td>Investment costs?</td>
<td>Value for customers</td>
<td></td>
</tr>
<tr>
<td>Additional services</td>
<td>Complexity?</td>
<td>Investment costs versus opportunity</td>
<td>Desirability?</td>
</tr>
<tr>
<td>pricing</td>
<td>Highest income?</td>
<td>Desired by retailers?</td>
<td></td>
</tr>
</tbody>
</table>

### 3.8.4 Limitations

The main limitations of the methodology in this phase is its broadness which does not allow for strong in-depth analysis of the requirements and objectives. The study is very comprehensive and tries to get a general understanding from four perspectives, platform, retailer, consumers and technology. The benchmark allowed a better understanding of platform theories in practise. However, this benchmark was consulted for a limited amount of platforms which all are successful. An in-depth analysis is necessary for design science, the next chapter will thus focus on getting more detailed insights in the design.

The fit of literature in both the consumer and retailer perspective was low. This research focusses on a new hybrid solution while literature focusses either on online or offline retailing. Furthermore, retailing characteristics highly differ per country, this makes general literature less applicable. Interviews allowed for specific information, however, since the number of reviews are limited and the selection of interviews, the representatives of these interviews can be questioned. Assumptions regarding generalization must be done with care.
4 DESIGN AND DEVELOPMENT

Many objective, requirements, goals, consideration and challenges are found during the defining of the solution space. Chapter 3 served as a general exploration of the design solution space. It serves as the first input for the research questions. The outline of this chapter is parallel to the research questions. All elements need further research in the form of an integral design assessment to define the system contour more precisely. Due to strong interrelation between those elements, many iterations have been done in this stage. The design will be made by constantly reflecting on theories, interviews, additional literature and how technology is able to support this. All the objectives and design variables identified in the previous chapter will be listed and researched. The goal per design variable is to identify the “right value” of that variable for the design.

4.1 RESEARCH METHODOLOGY

The identified requirements, objectives, knowledge gaps and design variable all need further research. The information sources to research these aspects are literature, survey results, interviews or desk-research. These information sources vary per element. Literature used in chapter 3 is used as fundament, this chapter will build upon this literature to come to the preliminary design. Starting point will be to use literature as primary source, if literature is abundant secondary information sources will be used.

The theories of the network effect and the theory of product pricing optimization will be used as fundament to determine the variables setting. In this chapter the consumer, retailers, data and the external stakeholders will be investigated again, this time to make decisions on the design variables and the design of the platform. While researching the design variables in this thesis, many interrelations are found and it is thus not possible to linear address the design variables. This means that a complete assessment must be made on all stakeholders, design variables, requirements and goals. Some requirements can be complied with the setting of multiple design variables.

For each design variable, the factors on which the trade-off will be based on are listed in tables as can be seen in Table 7. For each factor, the desired choice on the variable will be indicated in the last column. When a non-ordinal scale is used, the figures > and < represent a higher or lower setting on the variable axis. The factors include requirements, goals and general considerations within the trade-off. This assessment form is used to quickly show an overview of the steps taken.

4.2 PLATFORM PERSPECTIVE

*RQ1: What are important elements in designing successful platforms?*

Only very few papers are found which focus on platforms and its design. The most difficult MSP design decisions are those that involve features putting the interests of different sides of the MSP at odds with each other or with those of the platform owner (Hagiu, 2009). Such features create strategic trade-offs for the MSP because they generate positive value for some participants groups or for the MSP itself, but negative value for other participant groups. A principle would be to consistently solve-trade-offs in favour of the participant group that is most important the MSP’s long-term success (Hagiu, 2013). Another general principle used: If the costs of building and implementing is less than the value created for the multiple sides served, included them.
A more general design challenge would be to determine how many sides have to be present on the platform (Hagiu, 2013). And then, how must those sides be managed and how can they interact? In this thesis, the sides to bring aboard appear evident: The platform owner (always), retailers and consumers. But, should other entrepreneurs like bars and restaurants be added? And if we would take a closes look to the Retailer side, can we break them down in multiple side e.g. small, medium and large retailers? Or a breakdown on other characteristics such as product catalogue, willingness, total sales, etc... Hagiu gives the example of retailing platforms as of the simplest version of “which sides to bring aboard”. In our opinion, a side could be further decomposed than the at glance most obvious demarcation. A side can be decomposed to the point where only limited policy, or processes have to be designed in order to manage that side.

4.2.1 Geographical demarcation
First is the geographical demarcation. This design variable is derived from the network theory and focussing on reaching the critical mass point. The selection will be based on what is possible in the first year of development.

![Geographical demarcation](image)

To select the right value on this design variable, we have looked to a few criteria. Is it possible considering the available amount of time? Indexing a whole country could take years, but a limited amount of stores does not have enough value to the consumers. The main elements on which the trade-off is made are listed in Table 7.

<table>
<thead>
<tr>
<th>Table 7: Assessment framework for the geographical demarcation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element</strong></td>
</tr>
<tr>
<td>Considerations</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Requirements</td>
</tr>
<tr>
<td>Goals</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Those criteria depend on even more factors. The willingness of retailers depends on how well they are organized, innovativeness, character and potential added value. Since the main focus is on the small- and-midsized retailers, a geographical selection has to be made where many of these retailers exists. Another aim is to attract more and new customers to city centre shops which they maybe never heard of, this refers to the potential value of the platform.

48
Selecting a single street is not enough, the value of the platform with only a limited amount of products is not high enough for the consumers. The whole city is too large, assuming a city size of 100,000 inhabitants. The city centre provides smaller shops compared to a shopping mall and more shopping experiences. The identity of the city centre is better and consumers are more familiar with the district. The selection is brought down to multiple streets, or the whole city centre. Most retailers association cover multiple streets. It’s important to have multiple retailers associations because of the tensions between those organizations.

To conclude on this design variable, the select geographical size for the first phase must vary from several shopping district within the city centre to the whole city centre. The city centre has 192 shops according to the google places API. From those 192 shops, roughly half are small-midsized shops. A number of 80-100 shops still is a quite a large number. Assuming not all of them are deemed fit for the platform or a simply not willing. The technology is able to support to index shops in 0,5 to 2 days. To give a more general advice: Focus on a region with and identity which includes many small-and midsized retailers who willing to join.

4.2.2 Product types

The determining the most suitable product type is dependent on the shop selection and the technology. To total assessment framework is presented in Table 8. The selection of product types was not a simple tasks. No literature or other sources were found who give hints on the setting of the variable, therefore a broader assessment have been performed. Coming to valuable product types is dependent on the network theory, consumer price theory and the platform perspective.

![Product types]

**Table 8: Assessment framework for the selection of product types**

<table>
<thead>
<tr>
<th>Element</th>
<th>Trade-off based on:</th>
<th>In favour of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considerations</td>
<td>Some products have more value to consumers. (search, wait, risk, transport costs)</td>
<td>Fashion, Home furnishing, Household, DIY Education &amp; leisure</td>
</tr>
<tr>
<td></td>
<td>Products differ on their ease to index.</td>
<td>Personal care, Household, Consumer electronics, Education and leisure</td>
</tr>
<tr>
<td>Requirements</td>
<td>Critical mass</td>
<td>Selected limited product categories (focus)</td>
</tr>
<tr>
<td>Goals</td>
<td>Create identity of the platform</td>
<td>Selected limited product categories (focus)</td>
</tr>
</tbody>
</table>
The design variable is called “product types”. In a more broad term, this could be named user types. For each platform, the user with the highest added value should be added. This is not solely based on individual characteristics but an integral consideration. This integral consideration should lead to a high networking value and identity. The identity is needed for reaching the critical mass and providing a match between consumers and product offering.

For this broad assessment, several elements were used to rate the fit of the product type. An overview of all assessment elements is shown in Table 9. The elements are derived from the different perspectives with corresponding theories and finding. Each product type will be rated on the fit on each criterion. The principle used in assessing the factors are:

- Make sure that technologies are suitable to easily gather, store and dispatch the information
- Have retailers in those branches who are well organized in product catalogue and willing to go online
- Have products which score well on product-price matrix to consumers
- Achieve the critical mass point as soon as possible.

Table 9: Detailed assessment framework for the product types

<table>
<thead>
<tr>
<th>Perspective</th>
<th>criteria</th>
<th>Criteria explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer perspective</td>
<td>search costs</td>
<td>Whether consumers have to spend a lot of time searching for the right product</td>
</tr>
<tr>
<td></td>
<td>shipping &amp; handling</td>
<td>Do the shipping costs outweigh the price benefit when buying online? I.e. products which can be found for 5 euros online and 10 euro offline, the additional shipping costs still makes the online product more expensive.</td>
</tr>
<tr>
<td></td>
<td>product price difference</td>
<td>When the consumer can find cheaper but similar products</td>
</tr>
<tr>
<td></td>
<td>waiting costs</td>
<td>Can the consumer to afford to wait for 1 day, or can the good be transported for 1 day (fresh foods)?</td>
</tr>
<tr>
<td></td>
<td>risk costs</td>
<td>The risk that the product does not match the requirements. In terms of dimensions, fit or mismatch in colours</td>
</tr>
<tr>
<td>Technology</td>
<td>Data gathering</td>
<td>How easy is to acquire product names, descriptions and images</td>
</tr>
<tr>
<td></td>
<td>well indexed products</td>
<td>How well is that product category generally documented by retailers</td>
</tr>
<tr>
<td>Network effect</td>
<td>high value</td>
<td>How high is probability that the expected customers are buying these products?</td>
</tr>
<tr>
<td></td>
<td>critical mass</td>
<td>How high is value of the platform to retailers and consumers in that specific product types.</td>
</tr>
</tbody>
</table>
In total there are 75 product categories according to the chamber of commerce. The main product categories are:

- Shops in personal care
- Living and housing towards business
- Household products
- Shops in consumer electronics
- Do-it-yourself shops
- Education and leisure
- Retail non-in-shop

Appendix E: shows a comparison table between all the different product types and criteria. This research was performed to answer the question: ‘Which products are most suitable for the platform in terms of network effect, product price optimization and the technology? When scoring each product category on the different criteria, a few conclusion can be drawn. Below the top 3 product categories are listed and explained.

1: Household products.
The product category which scores best on the criteria are the household products.

Consumer perspective. High product difference. For example, a pepper and salt mill come in a dozen of varieties and prices. The shipping and handling costs online does not outweigh to the price difference when buying online. The waiting costs to these kind of products are high.

Technology: Products have barcodes, are static and easy to trace online.

Network: Everybody needs household appliances and many of those shops exists.

2: Education and leisure products
The second best product category which scores well are the education and leisure products. Examples of products in this category are bookstores, CD shops, music shops, pet shops, sports and / or camping shops, car accessory trade, toy stores, garden centres, office and business shops.

These products score high on the consumer criteria. The normal transportation costs are relativly high for the average price in this category. The wait costs are quite high since many products can be seen as a gift or needed for a vacation which both can be needed immediately.

Most of these products have a low update rate which means that the inventory of these products is static. This makes indexing these products low-effort. Furthermore, most of these products have barcodes, which are easier to index.

3: Fashion products
Product where appearance is extremely importing like clothes, jewellery have a high value to the platform since from the consumer perspective, the search costs, shipping costs and risk costs are high. From the network effect there can be concluded that this category scores high since there are many fashion stores, many consumers buying those products and a high likelihood that consumers buy at these stores. Big downside of this product is from the technology perspective. Indexing those products comes with high barriers. In fashion, the colours, feel and looks are extremely important and it’s hard to acquire and display that data in a reliable way. Furthermore, many different sizes exists and fashion is temporary which makes is hard to maintain the reliable data.
The used method is not suitable to draw hard conclusion. It is not the focus of the platform to exclude retailers, but only to focus on those who add the most to it. Since retailer selection is based on the geographical location, there is not much choice regarding the product type selection. Furthermore, commitment of retailers is more important than there product catalogue. The best method is to research which product type’s consumers want on the platform. This question will be answered in the demonstration and validation phase where a survey is conducted.

Which products are the most suitable for the platform from a consumer perspective?

The product types conflict the previous design variable: the geographical area. Selecting both on product types and area limits the amount of shops. A certain amount of shops is needed to create enough network value. Advice is thus to select a geographical region with enough shops with a suitable product catalogue

4.2.3 Commitment of users
Commitment of users is important. An analogy: What is the value of e-mail when the receiver only reads his mail twice per month? The rationale behind the commitment is twofold. Firstly the commitment is a reflection of expected value of the platform by the retailers. This expected value is indirect a translation of the consumer expected value. Secondly, a higher level of commitment results in active retailers which on it turn generates more offspring in the network.

![Commitment by retailers](image)

<table>
<thead>
<tr>
<th>Element</th>
<th>Trade-off based on</th>
<th>In favour of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considerations</td>
<td>More commitment has higher investment cost</td>
<td>Variable fee</td>
</tr>
<tr>
<td></td>
<td>Platform owner can perform tasks when requested</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Retailers has most expertise on products</td>
<td>Product indexing</td>
</tr>
<tr>
<td>Requirements</td>
<td>Develop a method/technique which allows non-digitalized retailer to add products to the platform with the minimum amount of resources</td>
<td>Depends per retailer</td>
</tr>
<tr>
<td></td>
<td>Retailers can update their own profiles</td>
<td>Monthly fee</td>
</tr>
<tr>
<td></td>
<td>Every retailers must have its own shop section with products and company info and be able to edit.</td>
<td>Monthly fee</td>
</tr>
<tr>
<td>Goals</td>
<td>Create commitment at the retailers.</td>
<td>Variable fee</td>
</tr>
<tr>
<td></td>
<td>Secure engagement of users; Retailers and consumers</td>
<td>Variable fee</td>
</tr>
</tbody>
</table>

Commitment is not something which can be easily influenced. Commitment is different for each individual retailers since expected value of platform differs and so is the effort to put in to the platform. From the network perspective we need to rapidly expand the platform size, therefore barriers to entry should be as low as possible, but is opposed to generating commitment. The design variable reflection
payment and effort to put in by the retailer, each of those elements could also be subsidized by the platform owner.

From the aspect of lowering barriers to entry, a variable fee is recommended. But for setup phase (creating shop profile) and product indexing, the lowest barrier would be that the platform owner does as much as possible. There is a clear trade-off on which it is difficult to make a decision on. In first phases, the retailers who are willing the most and have the highest offered commitment should be indexed first. If the platform owners see’s that retailers are not committing by themselves, an investment must be done to persuade the retailers.

4.2.4 Conclusions on platform perspective
The interrelation between the design variables of geographical demarcation, product types and commitment is high. Limitation of this research is the lack of scientific sources supporting the design variable assessment. For selecting the values on the design variables, most desk research and logical reasoning is used. The conclusions on these design variables should be done with care. To following advice on the design variables can be given as: Focus on a region of multiple streets in the city centre. Make sure this region has shops who are willing to invest and are active in clothing, leisure or household products.

As can be seen in the assessment tables, unknown exists about the perceived value. Those values cannot be estimated or logically deducted, therefore, those assessment criteria are listed as knowledge gaps. The demonstration phase should provide more insights in the perceived value on these criteria.

4.3 RETAILER PERSPECTIVE
RQ2: What are the requirements from retailers to join a platform that enables them to partly expand their activities to the web?

4.3.1 Literature
As already mentioned in the previous chapter, the network effect is highly present. A certain starting number of retailers and consumers must be gathered. Without retailers, there are no consumers. Retailers must be persuaded to make an initial investment in the platform. From interviews with various retailers and retailer association, they are willing to make this investment. The platform should focus on attracting the early adopters. The most willing retailer association should be first to focus on. The selection of this retailing association could be based on:

- their willingness
- possible financial investments
- number of shops
- variety of offerings
- relations with other associations

By creating commitment at the various retailers, the early adopters must become ambassadors of the platform (Eisenman, et al., 2006). This ambassador ship was also acknowledge in many interviews. Ambassadorship generates a higher consumer base and attracts more retailers. Increasing commitment can be done in various ways

- Make them part of development process
- Require financial investments
• Require time investments (indexing products)
• Continuous updates about design process electronically or in person

To attract the sleeping consumers who do not shop in the shop often, the indirect marketing does not function. The platform focusses on attracting more customers to the cities, therefore, the sleeping consumers must be reached. Direct marketing can be achieved in a few ways

• Consult various organizations within municipalities
• Contact local newspapers
• Spreading folders for each home.

The user base from the customer side can also be increased by offering additional services besides the search service.

• Coupons for bars and restaurants
• Special offers which are only available online
• Product reservation
• Loyal-tee programs
• Local-local delivery
• Surprises

The network theory tells us that when achieving a critical mass, the value of the platform has become high enough for consumers or retailers to invest in. Reaching that critical mass is essential for a sustainable platform

To speed-up the phase of reaching, a base value can be created. This could be by adding products from larger retail stores. Experiments show that they have a well-indexed inventory and that it is fairly easy to retrieve their product catalogue. Downside of this method is that the platform is flooded by products from the large retail stores while the platform focusses on the smaller retailers. The smaller retailers are, in the end, those to generate the additional value and indirect marketing. Those who pay to the platform should benefit more. Customers must maintain the feeling that the platform has complete offering without being misled.

Identifying who in the city centres are the innovators and early-adopters is essential to having the most effective first user base towards the critical mass. Those retailers must have an innovative setting, believe in the platform and have a high impact on other retailers. Furthermore, their product catalogue should have a fit for the platform. This product fit is discussed later in this chapter.

4.3.2 Retailer size
Retailers are different from each other, one of the key characteristics besides product catalogue is the size. Assumption that size also has to do something with the level of digitalization. Large retailer, having many products, often have a higher level on automation.

Table 11: Assessment framework for selection of retail types

<table>
<thead>
<tr>
<th>Element</th>
<th>Trade-off based</th>
<th>In favour of:</th>
</tr>
</thead>
</table>

54
Considerations

<table>
<thead>
<tr>
<th>Considerations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Large retailers suppress smaller ones</td>
<td></td>
</tr>
<tr>
<td>Small and medium retailers contribute financially</td>
<td></td>
</tr>
<tr>
<td>Large retailers have no commitment</td>
<td></td>
</tr>
</tbody>
</table>

Requirements

<table>
<thead>
<tr>
<th>Requirements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>create initial value for consumers</td>
<td>&gt;=large stores</td>
</tr>
<tr>
<td>Provide good query results fitted to consumer needs.</td>
<td>&gt;=large stores</td>
</tr>
<tr>
<td>Reach critical mass</td>
<td>&gt;=large stores</td>
</tr>
<tr>
<td>Make the platform suitable for small non-digitalized retailers to big corporates</td>
<td></td>
</tr>
<tr>
<td>Products information must include price, correct information, high quality images and brand</td>
<td>&lt;=medium</td>
</tr>
<tr>
<td>Consumers must know that stock levels are not accurate and must have the ability to check this with the retailer</td>
<td>&lt;=medium</td>
</tr>
</tbody>
</table>

Goals

<table>
<thead>
<tr>
<th>Goals</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Obtain critical mass in a short term</td>
<td>&gt;=large</td>
</tr>
<tr>
<td>Create commitment at the retailers. Retailers should contribute in terms of time, resources and money to the platform</td>
<td>&lt;=medium</td>
</tr>
<tr>
<td>Creating identity of the platform in terms of product catalogue</td>
<td>&lt;=medium</td>
</tr>
</tbody>
</table>

From the assessment framework presented in Table 11 the conclusion is that the desired value on the design variable per requirements, is indifferent. This shows difficult dilemma. This dilemma was already soon discovered and was presented to retailers in interviews. They acknowledge the fact that a complete offering of the city includes the large retailers but do have their doubts because of the fact they suppress the smaller retailers and that they cannot differentiate from them. This doesn’t make the dilemma easy to solve.

The aim of the platform is to be financial sustainable, large retailers are not expected to add platform value for the consumers and creates a high level of installed base. The only reason in include these large retailers and brand stores in the platform is to create added value for the consumer. However, it might be unfair for smaller retailers if the big ones join without paying to the platform. This dilemma was presented in interviews, retailers understand this dilemma and accept the presence or large enterprises, but in a more limited way.

The only way of providing accurate stock levels and prices from the large retailers is by efforts of the platform owner, this brings high costs and thus is not desired.

Advise on the design variable:

- Limit amount of indexing time of large retailers.
  - Only use scanning without validating
  - Show consumers the unreliability of the data
- On a search query; show the store name, maybe with a link to the product.
- Include as many as possible small and medium sized retailers.

4.3.3 Retailer distinction

The retailer distinction has been set as variable since retailers do want to distinguish themselves while on the other hand, the platform should show a homogenous layout to consumers. This variable does
not asks for a single selection, but can have multiple choices. The variable can be seen as a discrete scale

![Diagram of box options]

How can retailers distinguish themselves?

<table>
<thead>
<tr>
<th>Element</th>
<th>Trade-off based on:</th>
<th>In favour of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considerations</td>
<td>Those who pay, those who benefit</td>
<td>&lt;= logo at product</td>
</tr>
<tr>
<td></td>
<td>Attractive design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fixed benefit, fixed costs</td>
<td>Profile page, own store</td>
</tr>
<tr>
<td>Requirements</td>
<td>Variable benefits must have variable costs</td>
<td>Product overview</td>
</tr>
<tr>
<td></td>
<td>Layout of pages and products must be the same for all retailers.</td>
<td>Could be anywhere</td>
</tr>
<tr>
<td></td>
<td>Every retailer must have its own shop section with products and company info and</td>
<td>Profile page</td>
</tr>
<tr>
<td></td>
<td>be able to edit.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Create a platform which is suitable for the quick shopper and day tourist</td>
<td>Product overview vs Profile pages</td>
</tr>
<tr>
<td>Goals</td>
<td>Secure engagement of users; Retailers and consumers</td>
<td>Profile pages</td>
</tr>
</tbody>
</table>

The design variable in which retailers can distinguish themselves is derived from the platform perspective and explorative interviews. From the assessment framework presented in Table 12 we can derive several dilemmas. The dilemmas are in that each service requires different revenue for the platform owner and the differences between consumer and retailing preferences.

From interviews we can conclude that retailers want to distinguish themselves from other entrepreneurs. All retailers do agree that consumer must be presented with a clean, non-cluttered product overview. To increase the expected value of the platform, and thus increase commitment, the shops must be provided with some kind of distinction. From the requirement analysis on this design variable we can easily conclude that profile pages for each retailers are advised, though with the same format. An example could be the Facebook profile page. Though, creating personal web shop is not that complex from a technology perspective. A simple SQL command WHERE shop_id = X, results in a personal web shop. Offering a personal web shop for a retailers adds to the expected value. This personal web shop could be embedded on individual retailer website using an HTML iframe. When embedded by an iframe, own styling could be applied.

Layout of pages and products must be the same for all retailers.
Every retailer must have its own shop section with products and company info, and must be able to edit it.

Advice: Have a uniform product display of all retailers with a limited amount of distinction in the form of shop type icon. When clicking through, individual web shops per retailer with a standard layout within the platform.

4.4 CONSUMER PERSPECTIVE

RQ3: What are the customer requirements and motives regarding shopping online, offline or on platforms?

4.4.1 Data aggregation level

The data aggregation level which a shop is described.

<table>
<thead>
<tr>
<th>Element</th>
<th>Trade-offs</th>
<th>In favour of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considerations</td>
<td>More detail is more complex</td>
<td></td>
</tr>
<tr>
<td></td>
<td>More details costs more time and money</td>
<td></td>
</tr>
<tr>
<td>Requirements</td>
<td>Retailers can update their own profiles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Every retailer must have its own shop section with products and company info and be able to edit.</td>
<td>&gt;=Opening times</td>
</tr>
<tr>
<td></td>
<td>Develop a method/technique which allows non-digitalized retailer to add products to the platform with the minimum amount of resources</td>
<td>&gt;=individual products</td>
</tr>
<tr>
<td></td>
<td>Products information must include price, correct information, high quality images and brand</td>
<td>&gt;=Price</td>
</tr>
<tr>
<td></td>
<td>Consumers must know that stock levels are not accurate and must have the ability to check this with the retailer</td>
<td></td>
</tr>
<tr>
<td>Goals</td>
<td>The goal of the platform should focus on benefits for consumers and retailers rather that digitalization alone</td>
<td></td>
</tr>
</tbody>
</table>

What Table 13 shows is that the setting of the design variable is relatively easy. The fulfillment to several requirements, individual products have to be displayed with images. The indexing of all individual products takes a lot of time from retailers and the platform owner. The main dependency in this case is the efficiency of the technology regarding the indexing of products. The required resource to index products should outweigh the expected value of an online version of that product. This can differ per
retailer and product. The platform owner should stimulate retailers in indexing as many as possible products. The retailers should be able to judge for their own which products they want to index.

From the consumer literature and retailers we learn that products images are the most important element for the platform. Price is the second to important and selling no is the biggest dissatisfier. The best option is to provide actual stock ratings, but this is not possible for all retailers. If stocks are not accurate, don’t display them or at least warn that stock attributes are not accurate.

Advice is: Index as much as products with actual stock as technology and retailers efforts allow. This will fit consumer demands and is optimal in the trade-off between investment costs and value

4.4.2 Retailing process steps

Table 14: Assessment framework for selecting which process steps to embed

<table>
<thead>
<tr>
<th>Element</th>
<th>Trade-offs</th>
<th>In favour of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considerations</td>
<td>Complexity &lt;= Purchase decision</td>
<td>Legal issues &lt;= Purchase decision</td>
</tr>
<tr>
<td></td>
<td>Implementation effort &lt;= Purchase decision</td>
<td></td>
</tr>
<tr>
<td>Requirements</td>
<td>Monitor sales</td>
<td>Purchase</td>
</tr>
<tr>
<td></td>
<td>Correct product information must be showed including images Viewing all products</td>
<td></td>
</tr>
<tr>
<td>Goals</td>
<td>Creating identity of the platform. Viewing all products</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Create commitment at the retailers. Retailers should contribute in terms of time, resources and money to the platform View &gt;= viewing some products</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adopt elements which make shopping with use of the platform easier.</td>
<td>Take-away/Delivery</td>
</tr>
</tbody>
</table>

When looking at the requirements in Table 14, it must be possible to purchase goods through the platform in order to monitor the sales. The reason of monitoring the sales is that a commission based revenue is possible and the value of the platform can be determined. Purchasing goods has serious impact on the complexity, legal issues and implementation effort. Income must be collected and reallocated amongst the retailers. Payment systems result in more legal issues and requires significant efforts to implement. Later interviews showed that retailers are willing to pay per view/click on their products. Purchasing alone, is no added value for consumers. Purchasing should lead to additional services such as; loyalty points, surprises or additional discounts. Purchasing must be enabled if it is necessary for the first phase, otherwise this implementation must only be made.

Advice on this design variable is: Viewing all products for the first phase. In a later stage, for each added functionality it has to determine whether the implementation costs are lower than the added value. Determine the added value has to be performed using consumer surveys. In a late stage survey, it was
concluded that local-to-local delivery is high valued by consumer and thus a viable option in a later stage.

4.4.3 Additional services

Key design decision is on which sides to bring aboard. For retailing platform, the sides seem obvious. However, interviews resulted in the conclusion that bars and restaurant could be a side with an added value. Adding the side has to bring more value to the platform than it would cost to adopt them. Additional services are those elements which are not part of the traditional purchase process. The process steps such as take-away and delivery are already discussed at the process steps design variable. Additional services are found regarding bars and restaurants, events and amongst retailers.

Table 15: Assessment framework for selecting additional services

<table>
<thead>
<tr>
<th>Element</th>
<th>Trade-offs</th>
<th>In favour of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considerations</td>
<td>More commitment, less attractive</td>
<td>Digital coupons &amp; loyalty</td>
</tr>
<tr>
<td></td>
<td>More sides, more complex</td>
<td>Physical coupon</td>
</tr>
<tr>
<td>Requirements</td>
<td>Monitor the amount of goods sold and/or viewed by the platform.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Create a platform which is suitable for the quick shopper and day tourist</td>
<td></td>
</tr>
<tr>
<td>Goals</td>
<td>Enhance user engagement by offering additional services</td>
<td>≠none</td>
</tr>
<tr>
<td></td>
<td>The goal of the platform should focus on benefits for consumers and retailers rather that digitalization alone</td>
<td>Physical coupons or surprises</td>
</tr>
<tr>
<td></td>
<td>Embed city shopping experiences in the platform.</td>
<td>≠none</td>
</tr>
</tbody>
</table>

From interviews we can conclude that current cooperation is based on trust. Formalizing these agreements is not possible. A method should be introduced which allows entrepreneurs to choose their own connections. Another finding is that, according to retailers, consumer are tired of coupons. Hospitality providers lay coupons at certain stores, however, if the value of the coupon is too low, consumers have little interest. The expected value for consumers cannot be determined without either experimenting with this or by questioning consumers about this aspect.

Physical coupons are hard to trace and administer by the platform owners and are thus not recommended. Digital coupons are relatively complex to implement. A form of a digital coupon could be that if a consumers buys a product through the platform, he gets a QR code, which has to be scanned by the hospitality provider. Somehow, the coupon needs to be activated and deactivated, which is not that easy with digital coupons.
The only viable options is either introducing a loyal tee program or surprises. These options require that goods can be purchased on the platform, which is not the case in the first phase. A loyal tee program requires administration but surprises are relatively easy to introduce. A surprise could be that a consumer has a certain chance of winning a dinner cheque with a high value. The game element can trigger consumers to purchase through the platform instead of purchasing at the retailer.

Advice on this design variable is to firstly introduce surprise elements. In a later phase, other forms could be introduced. The expected value of the different services will be researcher in Chapter 6. Based on this research, a definitive conclusion can be made.

4.5 TECHNICAL PERSPECTIVE

From Chapter 3 and Chapter 4, many design requirements, goals, consideration, dilemmas and implications have been found. This paragraph has the aim to research in which extent technology is able to support different design choices. The general trade-off principle in the design is that the costs of implementation must be lowered that the expected revenue. This paragraph will provide the first insights research question 4 and 5.

RQ4: How to gather, store and use the retail data in efficient way?

RQ5: Which technologies are used for this platform and how do they need to be orchestrated in order to perform the required tasks of the platform.

The targeted acquiring of data is crucial for the use of this platform. Many different data aspects are necessary. In chapter 3 the solution space regarding data acquiring is sketched. We know from the consumer perspective that images, price and company contact information are important. From retailer’s side we know that we have three different type of retailers: small-non-digitalized, small-midsized-digitalized and the large retailers. Not all large retailers have an online product catalogue and if they do, only a few products are listed compared to the physical location. The retailers have in common that they are not willing to spend much time on product indexing. In this context, many different type of retailers and are not willing to spend many resources on products indexing, leads to a challenging process of data acquiring. This chapter will propose processes and technology use to effectively acquire the data.

4.5.1 Acquiring of Data

From the retailer perspective, first objective was to deal with small retailers without having any product data to the large retailers having their own website. The consumer wants to know the product name, description and images. For the 3 retailing types, technologies must be used which can derive the right product information. The best way of acquiring data is when it is offered in a machine, is readable and has a standardized format. The web, with all its product offerings, is far from standardised. However, only a limited amount of e-commerce systems is used, where Magento is the leader by far (Usage Statistics and Market Share of Content Management Systems for Websites, July 2014). Google introduced a standardized taxonomy for categorizing all products (Google, 2014). For product identification, the European Article Numbering (EAN) is the most used standard.

To acquire shops in a certain region, the google place API can be used. The API is limited to 10 searched, the radar search is limited to 200 searches. I developed a small test where we gather all google_place_ID’s within a radius of 1200 meters from the city centre of delft. This search can even be specified to type of shops. In the second phase, the places information query was used where you can download all information including opening times, pictures, address and website with the place_ID.
Limitation of this API is 25,000 calls per day per IP address. The gathering of shop information is thus viable.

4.5.1.1 Small retailers with no product information
A large part of city centre retailers have none or very limited information about the product catalogue. What we need to know is how many products they have, how well they are documented and how long it take to index one product. This expected amount of time should be lower that the retailer willingness.

The only machine readable and with standardized information is a small-non-digitalized shop are the EAN barcodes. Since a focus of this study is to use what is already build and orchestrate that in such a way that a total new platform with its own functions can be made, the attempt is to get all the necessary data.

(Computabel, 2014): “The barcode is most commonly seen in Europe (and most of the rest of the world) is EAN. It is a numeric only bar code system used for identification of retail products. Unique EAN numbers are allocated to each separate retail product, not just by product brand but by variation (weight, colour, flavour, etc...). Also separate numbers are required when the product changes (except when the price changes).”

4.5.1.2 Small retailers with digitalized product contents
The advantage of digitalized retailers is that they have lists with fieldnames such as EAN, product code, product name, short product name, price, supplier, and cost price and sometimes stock. The EAN experiment yielded such good results that it could be used for the semi-digitalized retailers. The process can be further automated since an EAN list is available. To increase the success rate of the algorithm, the product names can be added.

4.5.1.3 Large enterprises
As advised earlier, large enterprises should have a limited visibility on the platform since they do not contribute financially and could suppress the small and midsized retailers with their huge amounts of products. Again these stores can be indexed using the google place API.

Some of these large stores have already a complete product catalogue online. Web techniques exists which allow the platform owner to quickly crawl and scrape all products. However, the online product catalogue is not equal to what is available at the local stores. To match product catalogue, the same EAN search algorithm could be used, though, this is very time intensive.

Another solution is to not display individual products of those stores, but only show a logo when they possible would sell the product where the consumer searched for. In this way, we can use fast scraping methodologies and the large retailer product offering does not suppress the smaller retailers.

4.5.1.4 Updating data
Indexing the data is one thing, but updating the data is even more important. Many retailers have no accurate stock and price levels. If a retailer already indexed a product, the process to update it is relatively simple. Scanning a product and change the variables of stock level and price. Besides price changes, varying stock levels, the product catalogue can sometimes change as well. The rate of catalogue changes differ strongly per type of retailer. Hardware stores have a slow rate of change while fashion stores have a complete different stock each quarter of a year. The negative effect on less updating is unreliable data, the positive effect is saving of costs. To make this trade-off we need to
know the costs of selling “no” to a consumer. Other solution to solve this are either showing consumers the last update date, which represents reliability of the data, or consumer can request an actual stock level through the system.

4.5.2 BPMN
For visualising the design of processes in the platform, the business process modelling notation (BPMN) is used. Large and small design choices are made in this thesis, with the help of the BPMN all these choices are made more concrete and their interrelation will be shown. A general note on the BPMN is that each process performed by the retailer, can also be performed by the platform owner. This is due to the facts that not all retailers have the same expertise in using platforms. The BPMN is a high level representation and only includes first phase development items.

BPMN details in terms of functions per actor are shown in 0 BPMN (Figure 19) is display on the next pages. As can be seen in the diagram, the consumers have three different “thoughts” to start the shopping process. These “thoughts” represent the different consumer types. The process ends either with a visit to the shop, saving of product of no result at all. Of course, a potential consumer can stop in any process or jumps to another process.

A visit to the page would first display special offers, upcoming events or other forms of advertising. This page should breathe the city experience which individual cities can offer. Search results must display high quality images, prices, names, small shop icon, distance to the shop and if the shop is open or closed. For the large enterprises only limited information is displayed.

A tourist or day-shopper must see a quick overview of what Delft has to offer in terms of architecture and culture. The shop overview has to focus on the added value of the shop, which is the entrepreneur behind it. Furthermore, general information and a selection of products can be showed. Other types of consumer put a higher value on viewing the individual products of a selected shop.

Further important elements embedded in the BPMN are:

- Tracing of product views used for billing purposes
- Stock requests so consumers know if the item is available and at which price
- Lower the investments costs for retailers by offering to do the indexing for them.

As already mentioned, the technology is the backbone in achieving requirements and creating low investment costs for retailers and consumers. For the technology, a diagram is made which is presented in Chapter 6.3.
Figure 19: High level BPMN
4.5.3 Legal issues
Two aspects of potential legal issues arise. First is that legalisation about web-shops. This legislation is not hard to comply to and is considered as a given requirement in the thesis. A more important legal aspect is the use of content from others. The technology is the backbone in this platform and relies on the fact that third parties already indexed their products. In general, on texts and images lies property rights.

Property rights on images exists when there is some form of creative element. Images of products are often made as objective as possible and thus no property rights on those picture exists (van Bergen, 2009). When there would be a creative form of shadows, there are property rights. For text, the same principle exists.

A check should be built in which tells whether the image is an objective product representation.

Another legal element regarding the technology is the stealing of bandwidth. When the image would be downloaded from another server, you steal bandwidth. Since objective product do not have property rights, the images can be downloaded to the own server. This avoids stealing bandwidth and is faster in processing html. Further legal issues are that alcoholic beverage may not be sold or displayed online.

4.5.4 Representation
The representation of the data can be two fold. We already identified two types of consumers. The local citizens who wants to find a product quickly and the day tourist. While the day tourist wants to get an overview of the shops, events, bars, restaurants and other services like parking. The local inhabitants want to search for products and discounts. Of course, a solution can be to make a mix of the two representation but a better solution will be to have different designs for the different users. It possible to detect the location based on IP addresses. Several API exists who already provide this service.

4.5.5 Data Architecture (UML)
Since the focus of this whole study is the design a information system, a UML diagram is made which represents the data architecture. The UML does not include all detailed but does provide an overview of which data is needed, how it is connected and cooperates in order develop a complete system. The complete UML architecture is given shown in Figure 20. This UML is more abstract compared to a real database development. This diagram only shows the data structure for the development of the first phase. The schema is relatively easy while no complex components are removed, this shows the relatively easy data design compared to the complex nature of the platform.
Figure 20: UML diagram representing the data architecture
Figure 21: Data architecture of uploaded products
4.5.6 Connections with other retailers
From interviews with retailers we derived the requirement to embed city centre experience. Suggestion was made to include other entrepreneurs such as bars and restaurants. From interviews with those entrepreneurs, we conclude that they are not willing to cooperate without with anyone without permission. The architecture should provide in a “cooperation request” functionality. This cooperation must be facilitated in terms of coupons and financial allocation. Adding this side on board brings many complexity. For the first phase, the architecture does not support additional sides besides retailers and consumer, though the design must anticipate on embedding other sides.

4.5.7 Technology use and implementation
The platform has multiple stages, each stage has a different focus. The architectural design of the platform should be flexible. Many platforms which have been developed in the past had a different focus in the beginning. Overall, a model view controller structure must be used in order to make a flexible design which can be adapted rapidly. The first phase should be used for testing a generating network value. Since there are many unknowns and complexity is high, the principle of designing by doing should be adopted. To make this more concrete. A rapid development framework should be used which is suitable for the different users.

As graphical framework, Bootstrap is currently the most fast rapid development framework which works on all devices.

For the controller layer, the use of PHP is provided since this is fast and agile.

The data layer for the first phase should consists out of a relational database. This type of database is suitable for large amounts of data and easy indexing. In the first designs, the data is relatively standardized, however when the platform evolves, it is possible that a more object oriented database can be selected. Each product is unique, each product can be seen as an object with unique identifiers. The same accounts for shops, however they are standardized in many ways, they have unique characteristics. The geographical limit is bound to one country, elements can differ per country, which also speaks for a more object oriented database.

The focus of the platform is to reuse as much as possible. To make this way of programming possible in the future, our platform should provide the data in a machine readable format as well, using an API for instance.

4.5.8 Main learnings from technical perspective
The technical design in the form of the UML and BPMN are quite simple. These diagrams only represent the essential information which necessary to build a more detailed design of a database. Yet, the challenges are not so much in the architecture aspects, but more in the underlying technologies to match retailer and customer needs. Retailers generally have less expertise with computers, not willing to invest much time in e-commerce and have limited amount of digital information about their shop. On the other hand, Consumers have high demands on products information. The demonstration phase should further research the shortcomings of retailers, demands of consumers and technology must be designed which is able to bridge the gap.
4.6 CONCLUSIONS ON DESIGN PHASE

Literature provided the key design challenges, consumer requirements. Translating these design challenges into a more defined design was less supported by literature. Interviews and other research were used to support the important design decisions.

For many of the identified design variables, an augmented choice could be made. It is not possible to give any guarantees of “the best” option. While developing and implementing the design, freedom to alter the design should be present. Therefore, a staged development should be implemented in order to change function and/or scope during the development. From the platform perspective we learn that focusing on a limited potential user group is essential. The global choice was based on literature where a benchmark have led to a concretization for our design. In this way, the critical mass can be achieved more easily since the potential group scale is smaller. This focus must take place on the following criteria

- Focus on the city centre. This is a manageable scale and has a clear identity to consumers
- Focus on those retailing types which sell products who enhance the value proposition of the platform
- Embed retailers from multiple associations, in order to present backbiting.
- Focus on retailers who experience high opportunity costs and low investment costs
- Focus on groups which can be served with the same technologies

Defining which services are viable to implement in the platform is not straightforward. A trade-off between revenue first costs must be made. In order to make the trade-off, more information from retailers and consumers is necessary. These elements will be further researched in the demonstration phase, Chapter 6. Another choice which requires more information is in which shopping process steps the platform should support. Is the goal viewing and comparing products, or must the product be delivered to homes. Again, the trade-off is between the expected revenue for retailers, value for consumers, and revenue for the platform owner and the added costs.

For the services and process step selection, literature was used which focussed either on online or offline sales. For the mixed approach, no applicable literature was found. Therefore the theories are compared and reflected on our design. Together with the inputs of interviews, desk research and consumer insights, a decision could be made. These new insights could be further used in other design related to embedding technologies in city centre retailers

The technical design in the form of the UML and BPMN are quite simple. These diagrams only represent the essential information which necessary to build a more detailed design of a database. Yet, the challenges are not so much in the architecture aspects, but more in the underlying technologies to match retailer and customer needs. Retailers generally have less expertise with computers, not willing to invest much time in e-commerce and have limited amount of digital information about their shop. On the other hand, Consumers have high demands on products information. The demonstration phase should further research the shortcomings of retailers, demands of consumer needs and technology must be designed which is able to bridge the gap.

4.6.1 Knowledge gaps

Many uncertainties lay in the other design choices. The main uncertainties are in estimating values for the retailers, consumers and platform owners. Simply because the proposed platform is and no reference points are present. The knowledge gaps need further researcher. In the Chapter 5 and 6, further research will be done on these knowledge gaps.
Main knowledge gaps lie in the aspects of valuation of different services and components. How much value do retailers see in the platform and how much are they willing to invest. The potential revenue’s will be estimated in Chapter 5: Business case. The potential investment needs further research. To fill in this part, a survey is conducted within the demonstration phase.

The valuation of the platform by consumers is something which cannot be estimated. The selection of product types and product purchase process support must be based on the trade-off between added value and investments. To determine the added value, the customer valuation must be known. This valuation will be assessed in the business case and in the demonstration phase.

The platform viability is dependent on how well technology can digitally index to products of retailers. In order to draw conclusions on the viability of the platform in terms of technology support, we need to know how fast the platform/shop owner can index a shop. When knowing the technology support, we must determine whether the costs outweigh the benefits.

To know this, the following questions should be answers:

1. Which (digital) information is available at various retailers?
2. How much products do the various retailer have and what is their change rate?
3. How fast can we index products?

Question 1 and 2 will be answered by using the survey. Survey results are shown in Chapter 6. Questions 3 will be answered by building a demo with which an experiment is conducted to index products. The design of this demo and the results of the experiment are presented in Chapter 5.

4.6.2 Limitations

Main limitation within this literature search is the lack of results which have a high fit to this research. Scientific literature either focusses on online or offline shopping. The combination of those two research is what is interesting for this research. Furthermore, consumer behaviour, especially in e-commerce, is highly geographically dependent. For example, how do people use internet in their offline-purchases is relatively unknown. Considering the design science approach of this research, more specific information is needed.

The lack of literature resulted in the gathering of information from local retailers or non-scientific sources. It can be questioned whether to local retailers are representative for other cities or even for Delft itself. This limitation is acknowledged in drawing conclusions. Having a personal bias on the platform could have influenced the findings from interviews.
5 BUSINESS CASE

RQ6: What are the costs and benefits for retailers and the platform owner?

This chapter is a representation of the financials but gives an overview of the costs and benefits of the retailers, consumers, other entrepreneurs and the platform owner. We already shortly discussed financial sustainability of the platform. The aim of this chapter is to gain quantitative insights in the costs and benefits for each stakeholder. The platform does have its benefits as being showed in the thesis so far, but is has to be financially viable for all parties in order to achieve success. This chapter will provide the first insights regarding Research Question 5: “What are the costs and benefits for retailers and the platform owner?” This answer will be described for 2 stages. The start-up phase, approximately one year, and the phase where the platform is widely adopted.

Most business plans focus on questions like who is the customer, what is the market strategy, what is the market share, how do I promote my products, how do I price my products or what will the business owner earn. From the perspective of the platform owner, two customers can be defined. In normal business cases, is the customer is the one who pays. As proposed earlier, if a commission based structure and additional service fee is used, two customers are present. It becomes even more complex if the local governments or bars and restaurants are taken into account since they have also showed interest in the platform.

5.1 INVESTMENT

The investment from the perspective of the platform owner is twofold. We have the costs of developing the platform and the costs of setting up the network. One could argue that these costs are the same, but not in a platform situation. As discussed earlier the network effect section, an initial value must be created. This initial value is there to solve the chicken-egg problem and reach the critical mass, these problem require an initial investment. The development phases are split because, from a business perspective, an evaluation can be done in order to make the decision whether to continue the development or alter the design. These figures can be used to calculate the return of investment and to determine the necessary revenue models.

Investing in the initial value requires the persuade retailers to join the platform without having a single consumer on it. The first retailers, preferably potential ambassadors, must get the platform service for free, or at least for a minimum amount of value. The indexing of their products can be done with the help platform owner. The indexing of a typical store costs 0.5 to 2 days for one person. The focus area are city centres with retailers from the three selected branches. The number of shops to index is 22, based on the google places API. Indexing the first shops requires an estimated time approximately 1 month. These figures are derived from the technology experiments in chapter 0 and retailer survey in chapter 6.2.

The development of the platform will be based on the agile approach, therefore there is no fixed investment costs, but a continuous investment costs. This approach is supported by platform related literature and the benchmark since all platforms have a organic development. The development costs can be split up into 3 phases: first beta release, first major release with additional functions and maturity phase. The elements of the first phase are company profiles and product catalogue. The second phase has elements such as advertisements, views tracker, billing options, open registry and support for a variety of shops. The UML and BPMN which can be seen in paragraph 4.5.2 and 4.5.5 on page 65 and 67, shows the first phase of the project. From these diagrams we conclude that the development is limited to two months based on one full-time programmer. This time is derived from
personal experiences since I personally have the capabilities of developing such a platform. Based on current loan rates for programmers of 80 euro’s per hour the development costs are 13 weeks & 40 hours * 80 euros/hour = 27,700 euro’s. The second phase would cost 3 months, which would cost 41,600 euros based on three months’ work. Within this phase, process will be automated, new services and functionalities added bug fixing and tweaking of the current processes. The needed time of the maturity cannot be determined since it will by an evolving development process. Parallel to these process, time is required to index the shops. From interviews with various organizations we can conclude that several organization are willing to cover the investment costs.

Creating the critical mass at the consumer side also brings an initial investment. The marketing strategies are discussed later in this chapter.

5.2 MARKET SIZE
Market share is defined as the percentage of retailers using the platform of those who are targeted. Targeted retailers are those who are selected based on the factors; product catalogue, level of automation and geographical location.

The market share in consumer use is hard to determine. Without a substantial market share of retailers, there will be no consumers using it since the value of the platform would be too low. This market share is influenced by: marketing and the value of the platform. The value of the platform consists out of the amount of products offered, types of products and the additional services. The height of this value is a perception by individual consumers.

What is the value of perception of consumers towards the platform on the different elements?

The potential market is share is the whole worlds since this service, for as far as the research goes, does not exists. The number of shops in the Netherlands is 106.100 in the year 2012 (HBD, 2013). That figure includes supermarkets and large brand stores. The percentage of retailers within the target is 94.8% of the total which results in 100.500 shops. Based on the assumption that they have 1-10 employees, non-foods sector and no pure web shop. The total revenue of the target group is 83 billion euros. This total revenue shows the significance of the sector and possible impact of the platform.

More important is the short and middle-long term market share. These figures are hard to predict. For the city of Delft It would mean 192 shops in the first phase with a market share of 100%. This field is unknown and no true objective and accurate estimations can be made. The main unknowns that contribute to not being able to provide accurate estimations of the added value to the retailers. The added value is dependent on firm characteristics such as:

- Size
- Branch
- Location
- Clientele
- Willingness

That value is mainly dependent on the use of consumers on the platform. The use of consumers is then dependent on the value they receive from the platform.

What is true potential market share for city centre retailers?
5.3 Market Strategy

The market strategy has already been discussed from the network perspective. To summarize, the first focus on a specific region and certain product types. The generate consumer base, the first launch should be big.

5.4 Financial

This paragraph focus on a more detailed design choices regarding financials. The basic rules of platform pricing derived from literature are:

- For each group, charge a higher price when the group in question has less price sensitivity
- Charge more to the side that can extract more value from the other side
- For each functionality, a trade-off between added value and costs must be made
- Subsidize users who encounter higher investment costs than their opportunity costs in the first phase

5.4.1 Revenue model platform owner

As discussed earlier, a few potential income streams are possible. In the first phase, no revenue model is embedded in the platform since the first beta should prove the potential of the platform and not generate direct profit. Retailers are only willing the pay for what they receive. This means a cost per viewed product. In the second phase, a commission per sold product should be paid.

The average cost per click (CPC) as google uses it, is between 4 to 40 cents. With a mean of 20 cents, which strongly depends on the competition on the selected keywords. From interviews we can conclude that retailers are willing to pay the CPC rates. The exact rates should be calculated with more insights. To know the revenue stream, they number of click should be determined. This is also hard to predict. The CPC also differs on the click-to-purchase conversion. Without having the first demo results, no accurate pricing scheme can be set up. From interview we can conclude that some retailers are already using google AdWords, Groupon or traditional marketing methods. The AdWords expenditures are laying between 25 and 125 euro’s. Some retailers are associating with larger web shops which do the online marketing for them.

Commission based pricing is common in platforms such as EBay or Thuisbezorgd. The commission percentage are between 7-15% or 0.05 to 0.40 cents (eBay, 2014) and are dependent on the product price and total number of sales.

The platform owner could earn from additional services. As proposed, the local-to-local delivery is a promising feature, this service can create a revenue stream. Another added service are advertisements, a fee par add. Also extra services could be delivered to retailers, as identified in Chapter 3, not all retailers have the same capabilities in improving or updating their online presence. This could also be done for the retailers.

How likely is it that consumer will use these extra services? And how many? At what price?
From the interviews we can conclude that individual retailers are not willing to make a fixed investment in the platform, even a monthly fee seems not obviously viable. The main problem is that the proposed platform solution has not been proven or some retailers are conservative. This requires the platform owner to invest in building the network, gain commitment from entrepreneurs and acquire the data.

5.4.2 Third parties revenue
As mentioned in chapter 4, additional service are necessary in the platform then searching for products alone. Those additional service need to be performed by additional parties. Additional services makes the value of the product higher and thus more goods could be sold. For many additional services, external parties are needed. External parties are only joining when they have a benefit, which could be realising their goals or by a payments. Several additional services derived from the consumer literature are listed in Table 16.

Table 16: Potential additional services

<table>
<thead>
<tr>
<th>Additional service</th>
<th>Stakeholder</th>
<th>benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product discounts</td>
<td>Shop-owners</td>
<td>none</td>
</tr>
<tr>
<td>Coupons</td>
<td>Bars, restaurants &amp; events</td>
<td>More revenue</td>
</tr>
<tr>
<td>Parking discount</td>
<td>Local government</td>
<td>Better local economy</td>
</tr>
<tr>
<td>Less parking hassle</td>
<td>Local government</td>
<td>Better local economy</td>
</tr>
<tr>
<td>Local-local delivery</td>
<td>Logistic service provider</td>
<td>Income per shipment</td>
</tr>
<tr>
<td>Limiting lugging</td>
<td>Logistic service provider</td>
<td>Income per shipment</td>
</tr>
</tbody>
</table>

As identified this could be, discounts, coupons, parking discount, less parking hassle, local-local delivery and limiting lugging. For the coupons we need bars to join, for parking the local governments are necessary and for the local

Third parties could also make investments in the platform since this platform contribute to the goals of these organizations. Cities in most cases have funds. The entrepreneurial fund (almost all cities) and some cities subsidize these kind of initiatives. As already stated trough this thesis, for each added service, the costs of implementation must be weighed against the added value for the platform.

5.4.3 Revenue for retailers
The benefits for the retailers can generally be seen as that they will sell more. This can be due to the long-tail effect, impulse purchases and income from additional services.

5.4.3.1 Long-tail effect
Literature generally approaches retailers from either full brick-and-mortar shops or click-and-click shops. Cross-channel literature is present but is mainly from the consumer perspective. A very interesting cross-channel research from the retailing perspective is investigating the long-tail effect (Brynjolfsson, et al., 2011). The retail market is traditionally dominated by popular products sold by the traditional supply chains. Popular products are easy to find in local stores, while niche products are not. The internet enables consumers to buy niche products since the search costs are lower on the internet.

This resulted in the effect that most web shops are operating in the niche and brick-and-mortar shops focus on the popular products. The effect is visualized in Figure 9. The tension is where products are not really a niche but not popular as well. This group accounts for 10% of the products. This explains the results from interviews with brick-and-clicks that ther internet revenue is approximately 10%.
Retailers with the product catalogue of a brick-and-mortar shop can gain an additional 10% revenue using the web as retail channel.

![Economic cutoff points](image)

**Figure 22: Long-tail effect in online and offline retail.**

This effect implies that retailers using the platform can increase their sales with 10%, depending on the product catalogue. Retailers operating more in the direction of the niche products would thus gain more value. In the next chapter more focus should be on which retailers should be selected to join the platform first.

By reducing the search costs an increase of 5-10% of sales can be achieved. This is described by Brynjolfsson et al. (2011) using the long-tail effect. This percentage is based on the assumption that a retailer with its given product catalogue opens a regular web shop. The platform isn’t a regular web shop but could act as one if retailers prefer to do so.

### 5.4.3.2 Impulse shopping

Impulse shopping is where retailers can benefit from. More customers viewing more products means a higher chance of impulse shopping. Not only are consumers able to view products 24/7, but they will view products when they normally wouldn’t have and they can view more products in a short amount of time. Scientific literature regarding Impulse shopping dates back for an average of 25 years. A study conducted by the Daily Mail (2011) held a survey in 2011 amongst 2000 people in the UK. This research does not provide the answer of how much city centre retailers can benefit from the platform regarding the impulse purchases. What is does show is the significance of impulse purchases. The average male spends 32 euros per week and women 24 euros. This is 40% of consumer spending. This 40% accounts for all purchases. A part of that could be spent on the platform and other part is that “new” customers spending 40% extra in the city centre”. The effect for our platform is hard to determine but could range from 5-15%. 


Impulse purchases can occur when people are attracted to the city and see other products or when they are viewing products online. There are already examples of retailers like Walmart and Praxis who offer product for a higher price offline to stimulate online purchase. To make use of the impulse shopping online, it requires of customers to actually purchase items through the platform. Questions is, how many people are expected to come to a shop using the platform and make another impulse purchase. The other unknown is how many people will make impulse purchases on the platform. It is not possible to determine this figures, but this effect clearly has a significant impact.

The impulse purchase effect cannot be averaged on each retailer. The retailer where the initial purchase was made, doesn’t necessarily have to be the retailer where the impulse shop is made. The benefits of this effect cannot be allocated to those who invest. The most impulse purchases are made in food, clothing, magazines, wine, books, DVDs, shoes, trips, beer, and toiletries. This principle also understates the problem identified in Chapter 1. Other entrepreneurs benefiting from lively city centres also see a decrease in sales when shopping decreases.

**5.4.3.3 Price optimization**

Since the search costs and transportations can be lowered, the total product price decreases for consumers. Assuming that a consumer makes a decision based on the total consumer price, more consumer are likely to buy the products. The effect of lowering certain costs has not been researched, but likely, the effect is positive. No conclusion can be drawn on this aspect.

The maximum expected added revenue for retailers is thus long-tail + impulse + additional + price optimizations. The total benefits are hard to predict. Taken into account the 10% long tail effect and 40% impulse purchases, this effect could range from 10% to 25%.

**5.4.4 Costs of retailers**

Maintaining an up to date product catalogue, or pay for someone to do so. Some retailers already have an up to date stock, for those retailers, the costs will be lower. Since the platform owner is not aware of price and stock changes, it seems logic to let the retailers update this data. The technology proposal allows retailers to update these changes without requiring any expertise and limited resources

Offering extra services requires extra investments. A local-local delivery network must be used and paid for. The price of the extra services doesn’t necessarily have to be a cost-plus pricing. What is seen at e-tailers is that they provide free shipping to pursue customers to buy. According to the survey, customer put high value to free shipping. Retailers should be able to adjust their local-local delivery prices.

- Retailers must be able to set their own shipment prizes

**5.5 STRATEGY OVER TIME**

The development of all functionalities at once is not recommended. By developing the platform in phases; you can learn during development, have rewards during development, and attract new customers or parties. In this part a planning in time is presented.

It’s more than developing a platform, it is about creating a new network, especially when the additional services are implemented. From two sided market theory two rules can be derived

1. Focus on most price sensitive side
2. subsidize those who add platform value
The critical trade-off: increasing network size versus growing network value. From these rules we can derive a strategy. The first rule is not applicable since there is only one manufacturer of products, in contrast to the example of the Sony play station and game developers. For the second rule we need to determine who adding value to the platform is. The group who adds value differs in time. In the first phase, the focus is on subsidizing retailers. When a certain threshold for the amount of retailers have been reached, the consumer side will add more value and should be subsidized.

To make consumers aware of the value of the platform, a big launch should take place where the number of new consumers should be maximized. This maximization could be done by a single large subsidy.

Huge synergy advantages. Now geographical and product type demarcation. The first step is to prove this concept in this first phase. Then evaluate the platform, where there are a few options possible;

1. Stop development
2. Continue as is
3. Change focus
4. Add other product types
5. Expand geographical area
6. Add extra services

5.6 CONCLUSIONS ON BUSINESS CASE

Two main phases can be distinguished. The Startup phase when the platforms offers limited functionalities and only a few retailers are present. Within this phase, many investment costs have to be made and there are only limited possibilities of generating direct revenue from retailers.

The development of the basic functionalities require two months development and one month indexing. Based on UML, surprisingly simple but effective. Second phased based on learning from first. Trade-off between added value and costs. Third phase is continuous development. Main unknown trough this development is the added value of the different possible functionalities for all sides.

The potential market share in the Netherlands is 100.500 shops. Their revenue is 83 billion euro’s. This includes all shops and not only within a geographical bounds and selected product groups. The middle-long-term realistic market share is more interesting but hard to define. Revenue in this first phase is not important, creating network value is the most important aspect. For the first stage, only limited revenue comes from retailers. When that platforms shows its first proof of its revenue, a pay-per-view revenue model is viable. In later stages, more revenue could be generated by providing services such as platform purchases, loyal-tee programs and local-to-local delivery.

The added value of the retailers in terms of extra sales lies in four aspects: the long tail effect, impulse purchases, higher value proposition and extra traffic. Besides from the investment costs the costs of retailers are mainly updating the data: new products, prices and stock.

Overall we can conclude that the first phases need many investments in terms of development, subsidizing and generating user’s subscriptions. The potential of the platform is very high, but to reach this full potential, long-term efforts are needed.
6 Demonstration & Evaluation

From the previous three chapters, many knowledge gaps are identified. This demonstration phase has to aim to provide more insights in these knowledge gaps. The main knowledge gaps are:

1. How do consumers value the proposed functionalities of the platform?
2. What are the exact barriers for retailers to adopt e-commerce and how much are they willing to invest?
3. How well does the technology support the requirements from retailers and consumers?

As stated in the research setup, the design framework from Pfeffer included a demonstration phase. During the research, the problem more complex than expected which resulted in not enough time to develop a demo and to test it. However, during this research, many relevant similar projects have been found. A selection of three projects have been made which cover the elements which needed a validation through demonstration. From the platform perspective and business case we concluded that more information was needed about how customers value different functionalities. This value perception is needed to test the viability of the platform and its individual functions.

For assessing the knowledge gaps from the retailer perspective, a separate survey will be held. The number of interviews was limited which does not allow to draw hard conclusions on. By using a survey, quantitative insights in the barriers and opportunities of retailers can be gained.

The technology fit is seen as critical backbone of the platform in order to address both the retailers and consumer requirements. Consumers have high demands regarding information quality while retailers have only limited information available. Above all, retailers do not have the right characteristics to index by themselves or want to invest much.

6.1 Consumers

Main concern about the platform development regarding the consumers is their opinion about the added value to the platform as a whole and the individual design elements. The survey is used as explorative analysis for customer values. To cover all the design possibilities, three projects were selected. A short introduction video of each project was showed after which the respondents had to answer several question about this particular project. The used questionnaire together with the analysis and results is presented in Appendix H:

The first project was Voradius. Voradius indexed all products from large brand-stores which already have their product catalogue online. They focus on showing the shop names, distance to the shop and whether the shop is currently open. In some cases they show individual products with images.

The second project which was selected is: “The new Shopping”. This project focusses on city experience with showing individual projects, product reservation, loyalty programs, customized advertisements, product pick-up points and social media. The video showed the total version of the project, in reality only parts of it are realised.

The third project was “Webshop centre Oss”. This project does what a typically web shop offers but then combined for approximately 15 shops (webshopcentrumoss, 2014).

For each project and its individual functionalities, the consumer rated the value on a scale from 1 to 5. Where 1 represents not useful and 5 as very useful. By assessing the expected usefulness of each
function, we are able to make the trade-off if and when a function should be adopted in the further design. By taking a broader perspective, the viability of the whole platform can be assessed.

6.1.1 Sample description
A total of 109 surveys were filled in. The samples have been gathered sending invites with email. To avoid bias in the sample, the invites are sent to several groups with diverse people. The groups included sailing, city council members, 80 family members, fellow students. To determine the representativity of the sample, several general questions were asked. The questions includes age, gender, and shopping behaviour. Having a representative group in terms of shopping behaviour is important for this study. The shopping behaviour is compared to several other studies focussing on this behaviour.

Figure 24 and Figure 23 show the distribution of age and genders within the used customer sample. A wide age span is covered but outliers are present. The outliers can be explained by the high number of family members which responded. 25-35 are mostly fellow students and cousins, 45-65 are aunts, uncles and city council members. Besides from the family, most respondents live in Delft. The family members almost all live in the city of Purmerend. Purmerend can be compared to Delft since it has the same number of inhabitants, historical centre with high shop density and a rural hinterland near to a largest city of the Netherlands.

Considering the characteristics of the sample concerning the invite groups, age distribution and gender distribution, the results should be interpreted with care. The aim of this phase is to explore customers’ values on the platforms and not to present statistical evidence.

The study of Blauw Research (2011) commissioned by hoofbedrijfschap detailhandel and thuiswinkel.org was used check the representativeness of our sample. This study was chosen Because of its large sample size (n=1527), statistical information, focus on multi-channel aspects, focus on Dutch market and year of publication. Figure 25 and Figure 26 shows the comparison between the most important factors of our sample results and those of the reference study. The studies both show the same trend. No large deviations between the studies is noticed. The difference can be explained due to the smaller sample size, potential bias and different years in which the study has been performed. This comparisons shows that the study is some extent representative but results must be interpreted with care.
6.1.2 Searching for shops
The main aim of the platform is to lower the search costs for small and medium sized retailers in city centres. This questions was listed on the survey in two different forms. Both questions received the highest score on usefulness. The results can be viewed in Figure 27. Both questions show similar results, while these questions were asked in a different part of survey. Each respondents sees an added value in online orientation for offline shops. This results shows that consumers see an added value in the platform and are thus likely to use it.
6.1.3 Product images

From literature and interviews we derived the requirement of showing high quality images. This requirements brought many implications for the design in terms of complexity and viability. In a later stage, we found that detailed product information and reviews were important to consumers as well, however, those elements have not been tested with the survey. Figure 28 shows the results on the question related to which information consumers prefer to see in the platform. From these results we can conclude that images are more important than product names, this is also seen in other literature. That viewing product names or images is zero times rated as “not so useful” is no surprise.

6.1.4 Shop selection

Shops will be selected in the first phase on geographical location, size and product types. Many discussion took place around how to cope with the small and midsized shops and the large brand stores. Therefore, we included the shop size in the consumer survey in order to further investigate the trade-offs made. The results are shown in Figure 29. Interesting finding is that small shops are rated as
more useful by consumers to include in the platform. This can be explained due to the fact that search costs of large shops are lower since they are generally more known and consumers are familiar with the product catalogue.

![Graph showing perceived usefulness of shop sizes](image.png)

**Figure 29: Perceived usefulness of shop sizes**

### 6.1.5 Shopping process steps

A design variable focused on which elements of the shopping process should be included in the platform. The decision whether to include a process step must be based on the trade-off between investment costs and expected added value. To estimate the expected value, the survey included questions to investigate this. The perceived usefulness of consumers per process steps are shown in Figure 30. The orientation at home is the most useful element to include, which is actually the proposed function in the first phase. Ordering products and pick them up at the stores is the second process step to include in the platform since they are rated as highly desired and implementation costs are limited compared to local-to-local delivery. All elements are perceived as useful ($u > 3$), which shows the added value of the platform design.
6.1.6 Additional services

During the research many additional services are listed. The results shows the consumer perspective on the added value per service. The list includes services which were not implemented in the design. The ordering of product was seen as a complex solution. Ordering products is a requirement for the local-local delivery. Both these service are rated as useful by consumers. The product reservation is implemented in the design and is considered as useful by consumers. The loyal-tee program was implemented in the second phase of the platform as a solution to implement other elements such as events, bars and restaurants. However, consumers rate this service as neutral. However the loyal-tee program is rated as not very useful. When implementing the platform, loyal-tee-programs should either further researched or not included.
To monetize the value of a local-to-local delivery, the question has been asked to consumer how much that want to spent on this service. Consumers were able to select a value of 1,2,3,4 or 5 euro’s. With the benefit of hindsight, this should not be done using an ordinal scale but with a free format integer. As can be seen in Figure 32, consumers on average are willing to spend 3.6 euro’s. Current rates for local-to-local delivery for food are 1.50 euro. Local-to-local delivery seems financial viable, though no information is available about the margin on the current fee’s is available.

![Figure 32: How much euros are consumers willing to spend on local-to-local delivery](image)

General conclusion is that for the final design, the implementation of local-to-local delivery should be given a higher priority than the loyal-tee program. Of course, each added service remains a trade-off between the added value and costs to implement and maintain.

### 6.1.7 Conclusions and limitations

The aim of the survey was to explore the expected value by consumers. In general, the functionalities of the platform rated as high valued. Requirements derived from literature are supported by this survey. For the first phase, company profiles and individual products must be viewable on the platform. In later phases, ordering of products is seen as service with a high added value. Embedding other entrepreneurs such as bars and restaurants is not rated as highly valued. Considering the investment costs of embedding these entrepreneurs together with a loyal-tee-program, including these entrepreneurs should be reconsidered.

The project called “The new shopping” and its elements are not rated as useful. This project is piloted in several Dutch cities and was advocated as the future of city centre shopping.

Many suggested platform functionalities have a score of zero on “not useful”. This score either shows to potential value of the platform or the bias of the sample. This limitation must be taken into account. Another limitation is that the representativeness is not determined in substance.
6.2 RETAILERS
The main concern from the retailer perspective was the time needed to index the products and their commitment. Measuring commitment is not a straightforward process and is included in the evaluation. The time needed to indexing the products is also not easy to research trough demonstration. The questions in the survey are derived from the design variables and the identified unknowns. The survey questions were derived from design variables and unknowns and aimed in providing answers on the following questions:

- What is the time needed per shop to index it?
- How do retailers want to distinguish themselves?
- Which additional services are high valued by retailers?
- What are the expectations of the platform?
- What are the preferred pricing schemes for retailers?
- How much are retailers willing to pay
- How do retailers think that cooperation with other entrepreneurs can be facilitated best?

A main consideration in this thesis was to achieve a critical mass within a certain geographical area and shop types. The survey also had to goal by comparing the different retailing types on the answers of the questions above. The questions which were asked in order to be able to make retailer groups are:

- Retailer size
- Retailer willingness on adopting e-commerce
- Product types
- Product prices

The survey was spread among the 192 retailers in the city of Delft. Their e-mails were derived using a home-built automated script using API’s and web scraping. From the 192 shops, only 2 e-mails gave a bounce. The response rate was 6% which is equivalent to 11 respondents. The survey was conducted in a late phase of this research and time did not allow to gather more respondents. Due to this lack of respondents, no grouping within the sample size was performed. The results of this survey are not reliable. For each design element, the sample is described and the mean and standard deviation is given.

6.2.1 Time needed to index
In paragraph 6.3, the questions regarding the technology will be answered. The main question for the retailers is, how much products they have in stock and which information is available. Most retailers did not know how many products they have in stock which makes the figures unreliable. The differences encountered in the small sample size are huge. Numbers are varying from 1 (cinema) to more than thousands (tobacco store).
6.2.2 Retailer distinguishability

Previous findings show a dilemma regarding the retailer distinguishability. On the one side the preference is for a uniform layout, while on the other side retailers want to distinguish themselves in a certain manner. As can be seen in Figure 34, the retailer to prefer a strong distinguishability, but not an own web shop with own layout. This validates earlier findings from the interviews, however, based on the test group, no hard conclusions can be drawn.

6.2.3 Which additional services are high valued by retailers?

The functions identified in this research are proposed to the retailers. Retailers could place a checkmark whether they desired such a function or not. The results are displayed in Figure 35. What we can derive from this figure is that cooperation with other entrepreneurs is not a broad supported featured, this was also identified in earlier phases. Another interesting finding is that retailers do not want be a “true” web shop with shipments across the Netherlands.
6.2.4 Pricing

Figure 36 shows the percentage of retailers preferring a certain pricing scheme. Overall we can conclude that retailers are indifferent of the correct pricing scheme. This leaves options open for the final design. The pay per view/click is the most desired option. This option can be implemented in the first phase of the design.

Further questions aimed of deriving a figure on each pricing scheme. Responses show:

- 6.65 percentage average commission
- Fixed fee per month of 25 euro’s
- 0.06-0.15 euro’s per view.
- A single investment of 866 euro’s (N=3)

6.2.5 Conclusions and limitations

Considering the facts that the sample size was small, conclusion should be interpreted with care. The only justified use of the results is as an indication. Main knowledge gap was to know whether the opportunity costs of retailers were seen high enough to cover the development and maintenance costs. From the results we can get the notion that retailers are willing to invest enough to cover the basic expenses. The pay-per-view is the most desired payment method and also requires the least investments from the platform owner, therefore, this payment method must be implemented in the design. In order to determine the expected revenue, we would first need how many times products are viewed, which costs per click can be charged, and how much money it requires to index the product. These three factors are still unknown and can only be determined when the platform is operational.
6.3 Technology
As identified, the technology is a critical backbone in the design. Retailers have only limited amount of
digital information and are not willing to spent much time and resources in gathering the right
information. From consumer literature we know that accurate product information and high quality
images are important. There is a big gap present between retailers and consumers. Technology should
fulfil both requirements.
Besides the goal of limiting efforts by retailers or the platform owner to index products, it also has a
scientific and social goal. The scientific aspect is regarding information retrieval by searching, gathering
storing and transforming data into information. Data on the web is growing exponential, therefore
new techniques must be and can be developed to effectively make use of the exponential data growth.
By developing techniques and algorithms to gather information, the efficiency of services can be
improved.
There are several EAN code databases existing, paid and non-paid with or without an API. While
conducting several tests with products, none of these database seems to provide enough information.
When using the Google search website very good results were obtained. From most EAN codes, the
correct name and picture were derived. However limited results were achieved when searching for old
products and products with private labels. By entering the barcode in the search field, the results were
checked on accuracy of the search results. Since product indexing is the fundament of the platform,
an experiment was conducted with the aim of automated retrieval of product names, descriptions and
images. The initial incentive for the use of barcodes was the growing use of more advanced point of
sale systems which needed to rapidly scan barcodes in order to optimize retailing processes. With this
experiment we will be able to show other positive effects of standardization, the reusability.
This research consists out of six elements and is derived from general design science frameworks. To
measure in which degree the goal of fast, reliable and efficient, several criteria have been drawn up.
Those criteria are labour intensity, percentage auto indexed, percentage semi-automatic indexed and
whether the data is available to index.
First a scan was done on the retailers of which sources of information were present. Secondly, the
different information sources were analysed and the potential design space per source was examined.
The most promising techniques were selected on which finally one algorithm have been developed
further. Thirdly, an algorithm was developed and tested by gathering a random product samples from
shops. The results for the different stores types and products categories are listed.
6.3.1 Setup of experiment

First, a scan was done in order to assess which data is present which could serve as input for the digitization of products. The available information often only were the products itself, supplier lists. Some shops have a POS system with all possible products and some have actual product stock. A fast majority only had no actual product stock or only the products itself as information source.

Data sources on products are

1. The product itself (visual)
2. The tag attached to the product
   a. Name
   b. Barcode
   c. Specifications (optional)
   d. Some codes (optional)
3. A box (optional)
4. Tag placed by store owner (optional)

For the different sources product databases and various general search engines like Google were used to check which information was available. A various selection of search engines are used and only search engines which provided an API or other type of machine readable format since this is a requirement for further development steps.

The data source availability was assessed by determining how often that source is present at products in shops. The labour intensity of processing the data was also examined. This labour intensity is based on field research and the potential to automate. For example, barcodes processing could be automated very well. For each group, the results were listed, these numbers results the correct match percentage. All scores are rated on a scale from 1-5 where 5 is always the best score. A total overview of the scores is presented in Table 17: data/information scores.

<table>
<thead>
<tr>
<th>data source</th>
<th>Information source</th>
<th>availability</th>
<th>labour</th>
<th>result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 product visuals</td>
<td>Search engine</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2 tag name</td>
<td>Search engine</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>databases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Tag barcode</td>
<td>databases</td>
<td>5</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Search engine</td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>4 Tag specs +name</td>
<td>databases</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Search engine</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>5 Tag codes</td>
<td>databases</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Search engine</td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>7 Store tag</td>
<td>databases</td>
<td>3</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Search engine</td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

As Table 17: data/information scores indicates, the barcodes have shown to be the best sources to build a product search engine on. The tag included more information which also found be quite accurate. Another promising solution is by using the store tags, those tags are generally easy accessible since they are placed on the product shelf while the barcode stickers on products were sometimes more time consuming to detect. However, not all shops have separate tags on shelves and in some cases, the barcode did not match the products barcode.

When comparing the results, searching on barcodes is the most promising solution. There are several EAN code databases existing, paid and non-paid with or without an API. While conducting several tests...
with products, none of these database seems to provide enough information. When using the Google search website very good results were obtained. From most EAN codes, the correct name and picture were derived. This method proved to be successful, which led to the situation that no other methods were developed further.

6.3.2 Interesting findings
For different scenario’s, other combination between data and information source can be used. From the product itself, a human description can be made which can be used as search query in the search box. It found to be very difficult to be precise in the description. The object name together with brand resulted in non-accurate results. Even if aspects like colour and material did not contribute to the accuracy.

Besides the goal of limiting efforts by retailers to index products, it also has a scientific and social goal. The scientific aspect is regarding information retrieval by searching, gathering storing and transforming data into information. Data on the web is growing exponential, therefore new techniques must be and can be developed to effectively make use of the exponential data growth. By developing techniques and algorithms to gather information, the efficiency of services can be improved.

The initial incentive for the use of barcodes was the growing use of more advanced point of sale systems which needed to rapidly scan barcodes in order to optimize retailing processes. With this experiment we will be able to show other positive effects of standardization; the reusability.

6.3.3 Sample gathering
For this sample two main aspects are needed. The barcode, and product information in order to validate the results. To do this, an image of the product is needed, together with the barcode. For this purpose a web-app is developed to index those products quickly. Using a Bluetooth barcode scanner, which functions as a keyboard is, paired with an android device. Using the latest HTML5 technologies by using the smartphone camera and storing images locally, images can be gathered with the corresponding barcode. On the image, the product names and looks must be present. The reason for storing the data locally is due to the data limits and upload speed. The image was stored as “product”_ean_shop_price.jpg. These images could later be processed and stored into a database.

In order to gather a representative sample, we used several randomizers in the process. By visiting various store types and store sizes the random element is introduced. The used randomizer were:

- From each product shelve or lane a total of two samples were taken.
- Product selected randomly on vertical and horizontal axis.

The grouping of the samples was done for 5 different product categories and price. Products types’

\[ 	ext{Figure 38: Sample gathering process} \]

distinction in retailer literature is mainly based on two axis. First is the type of products and second is
the price (Lian & Lin, 2008). The samples gathering will be done by visiting several stores which primarily sell goods from this specific product type

- Shops in personal care
- Living and housing towards business
- Household products
- Shops in consumer electronics
- Do-it-yourself shops
- Education and leisure
- Retail non-in-shop

The process of sample gathering is schematically presented in Figure 38. Grey boxes represent human processes and white boxes represent automated backend processes. Web scraping from 10 different websites and then processing all image statistics takes 9.3 seconds on average. Therefore, this process is done asynchronously while scanning and not afterwards to spread the load on the servers. The duration of this processes is an important consideration when this technique would be applied on a larger scale.

Every single shop owner was willing to cooperate and some helped in the process. This willingness is important in order achieve the highest percentage of indexation. The gathering of samples from the product category “not-in-shop” was not conducted due to accessibility limitations. The accessibility of personal care products was also limited. Most jewellery is behind locked display cases. The retailer however was willing to open these cases and removing the price tags which were stickered over the barcodes. Stickers over barcodes were only seen at very small products with separate tags.

6.3.4 Sample processing

The first quick scan was done using the standard google search engine. Google provides an API for the search which returns a JavaScript object notation object which is easy to process using JavaScript. Retrieving accurate results using the google Custom Search API seemed promising but did not result in very accurate strings. While using the google API, the discovery has been made that the regular google search engine yield better results than the API’s. This discovery altered the process and from using the API, a scraping methodology was used which was far more effective.

The top 10 results often contained web page titles, names, advertisements or other random strings. For all individual words, the occurrences within the 10 results are counted. The assumption behind this is that words which have the most occurrences, are likely describing the product. The top 10 words are presented to a person. This person clicks on words in a specific order. In many cases, the order is automatically the correct. Also the images were shown where the correct image could be selected if it was present. If no proper images were found in the automated case, other methods were used. On average only 8 images were shown, this due to the fact that many websites have scraping protection or dynamic content. Other aspects to further improve are language wise. In this case, the language was not defined which sometimes resulted in German results. However, the google algorithm knows the server origin, which was the Netherlands, which resulted in most keywords written in Dutch. In a few cases, results were listed from existing EAN databases. The whole process of retrieving images based on product labels is shown in Figure 39: Sample processing process.
6.3.5 Results

Three samples were not gathered correct. The barcode scanned did not result in a proper EAN or UPC code. In total 134 samples are taken where 132 were used for further processing. Not all samples gave good results, however, if a combination of different methods is used, the accuracy could be increased even more. This combination is between the full automated and semi-automatic processing.

6.3.5.1 Keywords

The results on the keyword search are shown in Table 18. The average score of keyword retrieval is 84%. Though the sample size per product type is small, the differences between them are not large. No statistical tests have been conducted since that is not the aim of the study and the sample size is quite limited.

In total 73% of the keywords could be found automatically based on the EAN codes, adding manual processing only yields an additional percentage of 11%. The needed time to index those products is 11 seconds versus 35 seconds. A trade-off between time consumption an added value can be made in a further design.

Table 18: keyword retrieval results per product type

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>keywords auto</th>
<th>Keywords manual</th>
<th>score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shops in personal care</td>
<td>5</td>
<td>80%</td>
<td>20%</td>
<td>100%</td>
</tr>
<tr>
<td>Living and housing towards business</td>
<td>16</td>
<td>81%</td>
<td>6%</td>
<td>88%</td>
</tr>
<tr>
<td>Household products</td>
<td>51</td>
<td>73%</td>
<td>6%</td>
<td>78%</td>
</tr>
<tr>
<td>Shops in consumer electronics</td>
<td>24</td>
<td>75%</td>
<td>17%</td>
<td>92%</td>
</tr>
<tr>
<td>Do-it-yourself shops</td>
<td>24</td>
<td>71%</td>
<td>17%</td>
<td>88%</td>
</tr>
<tr>
<td>Education and leisure</td>
<td>14</td>
<td>64%</td>
<td>7%</td>
<td>71%</td>
</tr>
<tr>
<td>total</td>
<td>134</td>
<td>73%</td>
<td>11%</td>
<td>84%</td>
</tr>
</tbody>
</table>
The results per price group are listed in Table 19. The total number of samples is recued to 116 since many products did not had a visible price tag. What can be concluded from the table is that more expensive products are easier to index. More in depth research could be done to explain this difference.

Table 19: keyword indexing per price group

<table>
<thead>
<tr>
<th>Price Group</th>
<th>N</th>
<th>keywords auto</th>
<th>keywords manual</th>
<th>score</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>24</td>
<td>14</td>
<td>5</td>
<td>79%</td>
</tr>
<tr>
<td>5-10</td>
<td>18</td>
<td>13</td>
<td>1</td>
<td>78%</td>
</tr>
<tr>
<td>10-20</td>
<td>16</td>
<td>11</td>
<td>1</td>
<td>75%</td>
</tr>
<tr>
<td>20-50</td>
<td>15</td>
<td>13</td>
<td>1</td>
<td>93%</td>
</tr>
<tr>
<td>50-100</td>
<td>6</td>
<td>5</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>100-200</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>200-500</td>
<td>28</td>
<td>23</td>
<td>2</td>
<td>89%</td>
</tr>
<tr>
<td>500-1000</td>
<td>8</td>
<td>5</td>
<td>3</td>
<td>100%</td>
</tr>
<tr>
<td>total</td>
<td>116</td>
<td>85</td>
<td>14</td>
<td>85%</td>
</tr>
</tbody>
</table>

6.3.5.2 Images

Images are the most important element in online retailing and therefore included in this experiment. The problem with images is that it is hard for software to determine the match of an image. It depends on background colour, size, objective display and correct version of product etc... For this simplicity purposes, no advanced image selection method was used, but purely by human eyes.

As Table 20 shows, the total of properly indexed products is 82%, the variation between the different product type groups is minimal. The sample from the education leisure products is biased since they are taken from a sewing shop and car parts. For these two groups, images are less important and is thus likely that less images of that product exist on the web. Also the names to describe those products are very general which does not lead to specific results. Since only images could be derived from products of which the system was able to identify keywords from, the scoring percentage of 82% is high. This means that only 2% of the products without a name, did not return a good image.

Table 20: image indexing results per product type

<table>
<thead>
<tr>
<th>Product Type</th>
<th>N</th>
<th>image (auto)</th>
<th>image (EAN)</th>
<th>image (name)</th>
<th>score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shops in personal care</td>
<td>5</td>
<td>40%</td>
<td>20%</td>
<td>40%</td>
<td>100%</td>
</tr>
<tr>
<td>Living and housing towards business</td>
<td>16</td>
<td>44%</td>
<td>25%</td>
<td>19%</td>
<td>88%</td>
</tr>
<tr>
<td>Household products</td>
<td>51</td>
<td>43%</td>
<td>20%</td>
<td>16%</td>
<td>78%</td>
</tr>
<tr>
<td>Shops in consumer electronics</td>
<td>24</td>
<td>50%</td>
<td>13%</td>
<td>25%</td>
<td>88%</td>
</tr>
<tr>
<td>Do-it-yourself shops</td>
<td>24</td>
<td>38%</td>
<td>25%</td>
<td>25%</td>
<td>88%</td>
</tr>
<tr>
<td>Education and leisure</td>
<td>14</td>
<td>50%</td>
<td>7%</td>
<td>7%</td>
<td>64%</td>
</tr>
<tr>
<td>total</td>
<td>134</td>
<td>44%</td>
<td>19%</td>
<td>19%</td>
<td>82%</td>
</tr>
</tbody>
</table>
The image retrieval methods show almost difference between product types and product price. If, and how strong, the correlation between product types is, is unknown. The selected product types are very broad defined and products within these groups can range as well. Example. A household product could be a washing machine or a bucket. As seen with the keywords, more expensive products can be indexed better.

Table 21: image indexing results per price group

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>image (auto)</th>
<th>image (EAN)</th>
<th>image (name)</th>
<th>score</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>24</td>
<td>38%</td>
<td>17%</td>
<td>21%</td>
<td>75%</td>
</tr>
<tr>
<td>5-10</td>
<td>18</td>
<td>39%</td>
<td>22%</td>
<td>17%</td>
<td>78%</td>
</tr>
<tr>
<td>10-20</td>
<td>16</td>
<td>38%</td>
<td>13%</td>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td>20-50</td>
<td>15</td>
<td>53%</td>
<td>20%</td>
<td>20%</td>
<td>93%</td>
</tr>
<tr>
<td>50-100</td>
<td>6</td>
<td>50%</td>
<td>33%</td>
<td>17%</td>
<td>100%</td>
</tr>
<tr>
<td>100-200</td>
<td>1</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>200-500</td>
<td>28</td>
<td>46%</td>
<td>21%</td>
<td>18%</td>
<td>86%</td>
</tr>
<tr>
<td>500-1000</td>
<td>8</td>
<td>50%</td>
<td>0%</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>total</td>
<td>116</td>
<td>44%</td>
<td>18%</td>
<td>22%</td>
<td>84%</td>
</tr>
</tbody>
</table>

While conducting the experiment, checks were done to compare the automatically found images versus images search on EAN codes versus images searched on name. In some cases searches on image names resulted the best picture while the automatically found images were also good enough. For the purposes of this experiment, the first good enough option was selected. When such an algorithm would be developed further, an automated check between sources could be made. The image search based on name, was found to be very accurate and thus promising for further research.

6.3.6 Further improvements of this experiment

The used algorithm and process design is far from perfect, many improvements are possible. An improvement will not lead necessarily to higher success rates but to a time improvement both in product names and images. These improvements can be found in

- Automatic correct product description without clicking.
- Take picture of product
  - Recognize barcode
  - Recognize other codes
- Take picture of multiple products

Web scraping is legal, though websites can detect scraping and disallow access, this detection was seen in the process as well. The automatically retrieval of images succeeded in an average of eight websites. Scraping was also limited due to dynamic content loading. Google has a detection system for the google search pages. The practice of scraping the google search results is a common practice. Even Microsoft scraped google for enhancing its search engine Bing (John (stackoverflow), 2014). No official documentation is published about the google scraping abuse policies. From developers experiences the limit of scraping their website is 1000 requests per day per IP address. Various open source projects
are present which are specifically designed to scrape the google results using IP-address spoofing and proxies to increase the search limit to near limitless (compunect, 2014).

When indexing the keywords, the relative sites could be scraped for further product information and images. In a quick scan, it showed that the top hits of an EAN barcode almost always contained a high quality image. By scraping all websites from the first top 10 hits for images, and selecting the largest images. An even better image process could be obtained. In our experiment we only selected one image as proof that automated product catalogue processing is possible. With further scraping technologies we could download more images. In some cases, images or videos of people using the product in real life.

6.3.7 Conclusions on technology design
The goal of this experiment was to find a method which enables city centre retailers to easily index their products. That goal has been achieved since an average of 82% of all products can be correctly indexed with high quality images. The objective was to do this in an efficient and reliable way. The reliability was guaranteed with the validating image and the comparison between methods. In reality, shop owners have to do this check, which is even more accurate since they know their product catalogue better. Regarding the efficiency, 73% of all products were indexed in an average of 11 seconds and in 11% of the cases, this is 35 seconds. This time represent the processing time, the sample gathering time was excluded. Though, considering an average product catalogue, indexing a shop takes between 0.5 and 3 days.

This experiment was conducted to estimate the match rate of automated product indexing and the time needed to index. The sample size is too small to draw hard conclusions on, especially between product groups, but it can be concluded that the method is suitable for city centre retailers of digitalize their store.

With a certain degree of certainty it can be said that more expensive products yield better results and that if keywords are found, images can be found.

6.3.8 Limitations
Web scraping is a legal issue, though websites can detect scraping and disallow access. Google has a detection system for the google search pages. The practise of scraping the google search results is a common practise. Even Microsoft scraped google for enhancing its search engine Bing (John (stackoverflow), 2014). No official documentation is published about the google scraping abuse policies. From developers experiences the limit of scraping their website is 1000 requests per day per IP address. Various open source projects are present which are specifically designed to scrape the google results using IP-address spoofing and proxies to increase the search limit to near limitless (compunect, 2014).
7 CONCLUSIONS & DISCUSSION

This thesis researched the use and design science methodology to design an online platform which enables city centre retailers to adapt to the new retailing environment and improve their value proposition. In this final chapter we will discuss the main findings on the main research question “How should a service platform be designed and implemented to enable retailers in city centres to become a hybrid combination between online and offline commerce?” For each sub-questions the main findings will be given. After answering the sub-questions the main research questions will be addresses. After the main findings, the scientific and societal relevance will be discussed followed by research recommendation, limitations and generalizability. At last, a personal reflection on the research process will be provided.

7.1 MAIN FINDINGS

The last decade city centre retailers had less revenue each year mainly due to the rise of web-shops. This decreasing revenue leads to vacant shops in city centres, less attractive city centres, decreasing visitors in cities and less revenue for the hospitality sector. Though, city centre retailers have a lot of potential but need to adapt to new customer needs. This would require them to lower their search costs. By using a platform, small and midsized retailers can join the online sales with limited amount of resources while at the same time limiting the search costs for consumers. The thesis took a very broad approach on designing platforms and many different perspectives from network theories, stakeholder analysis, web semantics, interviews and surveys were used. The research was done in three main phases which are defining the design space, design of the platform and the business case. In each phase, the perspective from the platform owners, retailers, consumers and technology were used. For each perspective a different mixture of literature, interviews, desk research and field research was applied.

RQ1: What are the main design challenges, rules and considerations in designing platforms?

Though platforms are a widely known phenomenon, little is known about how they should be designed. The network theory, two-sided market and benchmarking helped in determining the important elements of successful platforms. According to the network theory, the value of platform increases exponential with the number of users. A user is expected to join if their expected revenue is higher than the investment costs. For platforms, there are two or more user sides involved which all generate value to the platform in a different way. The value of a platform from one side is dependent on the number of users from the other side and vice versa. This is side dependency shows a chicken-and-egg problem. To solve this problem, schemes must be developed to lower the investments costs or increase the opportunity costs.

In literature only general theories were found which did not provide enough detailed information for platform design. Therefore, a platform benchmark was performed which enabled us refine existing literature in several key aspects. First, the value of the platform for all sides depends on the match between sides. Within this finding, three contributions are made to existing literature. This match can be found by defining all sides’ characteristics and potential use of the platform. By defining characteristics, sides can be broken down in multiple sides. Defining more detailed sides allows for platform refinements, increase individual opportunity costs and lower investment costs. In our design it means to select retailers which have a high likelihood of affiliation with the first consumers based on 97
their geographical location, product catalogue and their willingness in entering e-commerce. Further focussing is beneficial for reaching the critical mass. The critical mass point is when the value of the platform services are higher than the investment costs without subsidy. When reaching this point, the registered user base increases rapidly.

The second main finding is that the platform owner should be considered as a side within the design. The characteristics of the platform design should again match with the other sides. In this way, a more complete trade-off between the costs and benefits of design choices for all sides can be made. The third main finding is that platforms change function and/or scope. This scope change is explained by the number of users, type of users and new opportunities. Platform designer should thus anticipate on major changes. The architecture must be flexible for the short and long-term. Short term to perform a trial and error method on offered functionalities and services, and long-term to adapt to the user-base requirements.

In the final phase of this thesis, relevant literature was found regarding platform development. In the winter of 2014 the research feature of MIT Andrei Hagiu published an article on building and managing platforms named: “Strategic Decisions for Multisided Platforms”. This paper was very relevant to this study. Andrei Hagiu published several practical design orientated papers from 2004 to 2011 related to platform like developments. The approached to defining the platform design are not derived from Hagiu but have high similarities. The overlap between the use and application of theories on platforms in this research and by Hagiu are very high. An overview of the platform elements from this research and Hagiu is presented in Table 22: Comparison findings of this research and Hagiu.

<table>
<thead>
<tr>
<th></th>
<th>This research</th>
<th>Hagiu</th>
<th>Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network theory</td>
<td>Early applied</td>
<td>(Hagiu, 2004)</td>
<td>3.2.1</td>
</tr>
<tr>
<td>Search costs</td>
<td>Early applied</td>
<td>(Hagiu &amp; Bruno, 2007;</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hagiu &amp; Bruno, 2011)</td>
<td></td>
</tr>
<tr>
<td>Two-sided markets</td>
<td>applied</td>
<td>Interwoven in each paper</td>
<td>3.2.1</td>
</tr>
<tr>
<td>Implementation strategy</td>
<td>-</td>
<td>(Hagiu, 2009)</td>
<td>5.3, 5.5</td>
</tr>
<tr>
<td>Pricing strategy</td>
<td>Lately applied</td>
<td>(Hagiu, 2006; Hagiu, 2004)</td>
<td>4.6</td>
</tr>
<tr>
<td>Product selection</td>
<td>Early applied</td>
<td>(Hagiu, 2009)</td>
<td>4.2.2</td>
</tr>
<tr>
<td>commitment</td>
<td>Early applied</td>
<td>(Hagiu, 2004)</td>
<td>4.2.3</td>
</tr>
<tr>
<td>Long-tail</td>
<td>Lately applied</td>
<td>(Hagiu &amp; Yoffie, 2009)</td>
<td>5.4.3</td>
</tr>
<tr>
<td>Phases/staging</td>
<td>Early</td>
<td>(Eisenmann &amp; Hagiu, 2008)</td>
<td>5.5</td>
</tr>
<tr>
<td>Reseller or MSP?</td>
<td>-</td>
<td>(Hagiu, 2007)</td>
<td></td>
</tr>
<tr>
<td>Interaction regulation/</td>
<td>-</td>
<td>(Boudreau &amp; Hagiu, 2008)</td>
<td></td>
</tr>
<tr>
<td>governance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power of content providers</td>
<td>-</td>
<td>(Hagiu, 2011)</td>
<td></td>
</tr>
</tbody>
</table>

The similarities between the researches performed in this thesis and the one performed by Hagiu validate the conclusions and methodology. This validation emphasizes the relevance of the used literature. The research was done independent without overlap in references. By using the design science methodology, aspects of Hagiu’s research were deepened. Hagiu for examples states that one of the most important design decisions is to define how many sides a platform has to bring a board. Design sciences allowed us to further specify the sides into more detailed sides. This way, a better selection of users can be made. All research of Hagiu was used for this comparison and thus no papers were excluded for the comparison. The elements identified by Hagiu, which are not used in this research, would have been an added value. Especially the part about interaction regulations could be
deepened and embedded into the design. Everywhere where interactions take place, rules must structure this in order to satisfy all stakeholders and to safeguard the long-term success.

RQ2: What are the requirements from retailers to join a platform that enables them to partly expand their activities to the web?

Not much scientific literature on motives for retailers to start a web-shop or not is available. What was found is that the retailers’ characteristics do not match the requirements for a web-shop. These characteristics are location, price setting, internet experience, product catalogue (popularity), value proposition and the managers’ personality. Retailers only invest if they think that the expected revenue is higher the expected costs, this is called the opportunity costs. Since the platform has not proven its added value, retailers are sceptic and do not see a positive opportunity costs. To lower the investment costs, the early adopters must be subsidied by the platform owner in terms of money, help and a preferential treatment. Technology should be focussed on lowering these costs as well. To increase the expected value, retailers need to be involved in the design process and trust must be generated. Having a personal section, freedom and the ability to distinct themselves on the platform is rated as a high value for retailers. The degree in which sides can distinguish themselves is a general finding which can be used in all forms of platform development.

A knowledge gap identified was that it was unclear why 90% of offline retailers do not have an internet presence, while many studies have shown that retailers benefit when adopting e-commerce. From interviews we can conclude that this mainly has to do with the personal opinion of the shop-owner. The owner does not have the expertise or is willing to invest in it. Furthermore, the city centre retailers who are present online, do have the appropriate firm characteristics for e-commerce. These characteristics are based on pricing, location, product catalogue and level of automation. The identified requirements are thus mainly based on limited investments in terms of time and money. The platform owner has to invest in attracting retailers, the revenue should than be based on a pay-per-view structure for retailers. Furthermore, the platform owner takes over all required expertise in e-commerce.

RQ3: What are the customer requirements and motives regarding shopping online, offline or on platforms?

Many literature is present on either online or offline consumer behaviour. Literature is present which shows cross-channel behaviour by consumers, but it doesn’t perfectly fit to the platform solutions. Since the platform design includes a hybrid combination, not many relevant literature sources were found. For assessing the retailer perspective in scientific literature, non-scientific literature and other studies are used. Scientific literature did not provide the right detailed information which is necessary for the design science. Furthermore, consumer behaviour differs per country and changes rapidly. Non-scientific reports had the right detailed level, focused on the Netherlands and were generally more recently published. By comparing the e-commerce research and the platform situation, overlapping design requirements were found. The most important requirements are the display of product images, price, product names and clear conditions. To meet these requirements from the technology and retailer perspective is challenging.

Many unknowns regarding consumers were identified and were thus researched using a questionnaire. These unknowns mostly included how consumers value online presence of the physical store at which they want to make a purchase. To estimate the added value of the different services, a survey was conducted with 109 respondents. This survey showed that the proposed platforms has a high added
value. The searching for product at small and medium sized shops were unanimously rated as useful. The requirements regarding product information which were derived from literature, were all validated by the survey. The additional service of local-to-local delivery was rated very high and consumers are willing to spend 3.9 euro’s on average for this service. Limitation of this research lies in the fact that no accurate estimations on expected consumer use can be given. Many highly rated requirements for web shops are naturally for city centre retailers, these requirements include favourable return possibilities, personal service and trust.

From the stakeholder identification and the interviews the goal of embedding other entrepreneurs, such as bars, restaurants and evenest, was derived. From interviews with these entrepreneurs, a medium enthusiasm was shown. The consumer survey showed that consumers do not see an added value of embedding other entrepreneurs. Embedding other entrepreneurs whom are not included in the platform design because of the added complexity and the required investment.

RQ4: How to gather, store and use the retail data in efficient way?

From the retailer and consumer perspective, design elements were set which are challenging from a technology perspective. The condition for the technology was that it limits the amount of resources needed by retailers to index their products while on the other hand, consumers had stringent requirement regarding information of products. The requirements were high quality images, prices and accurate stock level. Fact is that many retailers do not have any digital listing of their product catalogue. The only machine readable, and thus able to index data, are barcodes. Since the technology is the backbone of the platform, an experiment with a self-developed algorithm was conducted to index products automatically based on barcodes. This method proved its potential and can be improved further. In short, the method searches on google with the EAN barcodes. All results are analysed and they individual words are counted and determined in which order they occur. Based on these words, a product name and keyword structure were derived. From the links in the search results, the highest quality images were shown to the user, who on his turn had to select the best images. Processing time of a product is estimated on 11 to 35 seconds per product. This experiment shows how valuable it is to use standardized barcodes and how targeted data gathering from existing sources can contribute to development of new technologies.

RQ5: What are the costs and benefits for retailers and the platform owner?

In order to develop a viable platform, a sustainable financial business plan should be developed. Main limitation in the expected revenue are the unknowns regarding the use by consumers and commitment of retailers. Retailers have indicated to base their decision on expected revenue and costs. A revenue model with costs per view (CPV) is considered as the best options for the design. CPV is most desired by retailers and requires minimal investments from the platform owner. When purchasing products through the platform is available, a commission of 5-10% on each product could be taxed.

Third parties could also make investments in the platform since this platform contribute to the goals of these organizations. Cities in most cases have funds like the city marketing fund, entrepreneurial fund, local economy funds and innovation funds. Those organizations can help in the setup phase of the platform in each city. The maximum expected added revenue for retailers is the long-tail effect + impulse purchases + additional services + longer (digital) opening times + consumer price optimizations. The total benefits are hard to predict. The 10% long tail effect and 40% impulse purchases taken into account, these effects can result in a significant increase of income.

RQ6: What are good strategies concerning technology and stakeholder management to increase the chance on a successful implementation of the platform?
This research question is mostly answered from the platform perspective. Creating networks was derived from MSP theories. First the focus must be on a geographical area with enough shops that have a suitable product catalogue. The chosen region is a large part of the city centre. The shop density is high and consumers are often more familiar with the area. The most suitable product categories are household products, leisure products and fashion products. These product categories have a high value to the consumer transaction costs and are easy to index. From the benchmark we learned that platform change function and/or scope over time. This requires a flexible architecture which can adapt to changes in function and/or scope.

The platform is an unknown entity, and many scepticism is present amongst retailers. Generating trust and commitment with the retailers is essential. Generating trust can be achieved by approaching third parties like the city marketing and entrepreneurial fund. Those organisations are generally well trusted by retailers. An investment from these parties increases this trust. Retailers should be involved in the design process and contribute in order to achieve commitment and make them ambassadors of the platforms. Ambassadors have a positive effect on other retailers and increase consumer use.

The platforms aim on attracting consumers to the city centre who would not come in the current situation. This group of customers is hard to reach. The main question is how to reach a consumer who rarely or never visits the small shops in the city centre? Direct and indirect marketing methods should be used in cooperation with third parties. A good way of starting the platform for consumers is with a big bang launch.

“How should a service platform be designed and implemented to enable retailers in city centres to become a hybrid combination between online and offline commerce?”

Now coming to the main question as stated above. How to enable city centre retailers is by cooperation in order to decrease invest costs for online visibility and exploit the city centre advantages. From the network theory, focus is key and from the retailer perceptive commitment is essential. The implementation of such a platform remains fuzzy science. The platform is new, which brings many uncertainties and has limitations on the platform adoption for retailers. Many unknowns have to be answered by experimenting. Platforms evolve rapidly, especially in the first phase. Therefore a flexible design should be made which allows testing, improving and expanding the platform rapidly. The first focus lies on creating a beta version with the minimum amount of investment costs included the high valued functionalities. Insights from the beta testing must be user to refine the design and add new functionalities.

### 7.2 Scientific relevance

The main contributions are made in the platform and with technology perspective. Platforms are becoming a widely known phenomenon, motivated by the lowering the costs of information sharing. Examples of these platforms are airBNB, car sharing or UBER. Benchmarking with these platforms could lead to new understandings about platform behaviour and strategies. Despite the increasing use of platform solutions, few research has been done. Within this research many elements are derived which can be used for understanding and developing platforms. These elements are the match between sides, critical mass, user definition and design principles. Though not are literally present in this thesis, a framework for further platform design could be developed from this thesis.

Studies which show how city centre retailers can benefit from adopting e-commerce are present. However studies which focus on the question why 90% of the city centre retailers are not yet present
online are abundant. This research identified and concretized these barriers for retailers. The main contribution from the consumer perspective is making a combination between online and offline related consumer studies. This combined assessment, supported with a survey, shows the value of internet related solutions in offline shopping.

Contributions from a technology perspective were also made. Internet is growing exponentially and new techniques are developed to translate re-use data into valuable information by using information retrieval algorithms and natural language processing. The experiment conducted in this paper shows to potential of effective information retrieval for the web. The experiment also shows the importance of standardizations and its benefits for re-usability.

7.3 SOCIETAL RELEVANCE

Supporting small and midsized retailers helps to improve the local economy, not only in terms of employees but also for an attractive city centre. City centres, or other shopping centres, are the heart of many cities. Those centres have a societal value which cannot be directly monetized. The platform aims to help city centre retailers to adapt to new shopping behaviour and to attract more of the citizens in the city, this helps to improve the liveliness of the city. Internet already changed entire industries such as the music industry. The internet create a different environment to which firms have to adapt. New business models need to be developed for firms which are not able to adapt to the new environment. These new business models will help to improve the employment and welfare. Furthermore, an overall optimization of costs leads to less expenses by customers.

A more long term effect is anonymization of the society, partly due to the rise of web-shops. This trend is hard to reverse, since less human interference is often cheaper. Though, I dare to ask the question whether these effects, when seen on a larger scale and for a longer period, are desired. Before the internet partly destroys existing firms, solutions must be found in order to adapt the business to prevent bankruptcy and loss of capital.

Research question 5 focuses on the monetary costs and benefits for retailers and the platform owner. However, the benefits account for a wider group and differ per retailer. The retailers, who currently have high search costs, benefit the most from the platform. Search costs are higher for smaller shops since their product catalogue is generally more unknown compared to large brand stores. Stores with a more niche-type product catalogue also have higher search costs and therefore can benefit more. Besides from the suitability of the shop characteristics, shops are expected to sell more due to a better value proposition as stated in the main findings.

The city centre is often the heart of the local economies of municipalities. The current local economy is declining partly due to the decreasing number of consumers. This has an effect on the local retailers and all other associated entrepreneurs and event organizers. Municipalities elsewhere invest a lot in improving the local economy by developing artefacts for retailers. The proposed platform is self-sustainable, is beneficial for the local economy and thus the local government can also have a benefit.

The design proposed in this research is focused on the city of Delft, but could be launched in other cities as well. The design is made so that it is generalizable for other cities, but it must still be validated. If this is validated, the proposed platform design could have a positive effects to many more local-economies in the Netherlands or other countries.
7.4 Generalizability

Throughout the study Delft was used as reference city to base the design on. From literature we already know that retail sectors have different characteristics within each country. The first question is whether the characteristics of Delft can be applied to other cities within the Netherlands. The unique characteristics of Delft are:

- Historical centre
- Many tourists or one day-shoppers
- 15% of its inhabitants are students of the University of Delft
- Locked in between the 2nd and 3rd largest cities of the Netherlands

The awareness of these unique characteristics of Delft was present throughout the research. The aim of the design is to cover at least the Netherlands. This awareness resulted in the fact that the final design is not focussed on tourists. Within the consumer surveys efforts were made to improve its representativeness. To determine the generalizability of the results, we need to know which city characteristics have a significant impact on the design and how those characteristics differ per city. Compared to other municipalities, Delft has an average amount of citizens, high citizen density and a relatively low income per capita (CBS, 2013). The main categories in which cities can differ and which are related to the design are:

- Network value
- Size and geographical location
- Consumer types
- Retailer types

To determine the important aspects, we have to distinguish those elements which are adopted in the first phase and later phases. Geographical selection for example is a strategy derived from network theory to accelerate network growth. Another distinction must be made between the design itself and the value of the platform perceived by the users. The design itself focusses on limiting the costs and increasing opportunity costs for retailers and consumers. A retailer or a consumer is only likely to join if their opportunity costs are higher than their investments costs. Question is then how those costs are perceived in different cities.

The network value of depends on the amount of relevant users in that network. A shop 50 kilometres away is less relevant to a consumer compared to one which is only a few kilometres away. The amount of shops within the relevant range can change, which also affects the network value. If the opportunity costs for certain areas are lower than the investment costs, the design will not fit. For example, a rural area where almost no shops are present within reasonable distance, the opportunity costs are low for consumers. The opportunity for those consumers is to see what is available in a larger city nearby without having to travel to that city. Do determine the fit, the match between retailers and consumers must be determined. This match has to be determined per case. It can be assumed that current shops have a match with their surrounding network of consumers, otherwise they would of course have no customers.

The main questions about the generalizability of the results from the consumer perspective can be found in the survey sample representatively, and the statements of the local retailers on their specific customers. The question then is: do consumers significantly differ in Delft compared to other cities? Farag, et al.: (2006): “People living in a (very) strongly urbanised area have a higher likelihood of buying
online, but people with a low shop accessibility buy more often online.” The literature used in the
design had a national scope. The generalizability regarding consumer types is hard to determine.
Besides from the tourists and the high student population, there are not much reasons to assume that
the design would not fit in other cities.

Derived from literature and interviews with retailers, the focus was on limiting the investment costs..
If these investments costs are rated different in other cities, the solution is less generalizable. The
opportunity costs can also differ per city. Looking at the focus of this research, to enable hybrid
retailers, each retailer has to make the trade-off between investment costs and opportunity costs. The
design lowers the investment costs, complying with retailer preferences. The question then is, do the
retailer preferences differ, or do the opportunity costs differ? It is likely that there is a difference in
preferences, due to the characteristics of their location and personal opinion. However, cost-based
incentive is present for each entrepreneur. The difference is then in the valuation of these costs and
revenue.

Delft has some unique aspects which were acknowledged while performing the research. The results
are generalizable for urban areas within the Netherlands, but less for rural areas. The density of shops
must be high in order to gain from the network value. Differences in consumer characteristics in other
cities and how they affect the design, are not researched in this thesis. Deploying the platform is other
cities would validate its generalizability.

7.5 LIMITATIONS
A general limitation in this research is choosing Delft as case since it limits the generalization of the
platform design to other cities, regions, countries or continents. Another general limitation was found
in the retailer, consumer and platform perspectives. Literature did not provided the precise
information which was needed for design science methodology. It is also shown that retailing
characteristics differ per region and change over time. These two general limitation of the literature
led to more use of secondary information sources which are less reliable and generalizable. Though,
only secondary sources were selected which can be seen as reliable.

The benchmark was provided useful insights in important platform design decisions. However, this
benchmark was limited to the available information on platforms. This resulted in the fact that only
successful and widely known platforms are included in the benchmark. The benchmark was performed
based on criteria which were not derived from literature. The selected platforms and comparison
criteria were continuously updated to maintain a high relevance.

The fit of literature in both the consumer and retailer perspective was not high. This research focusses
on a new hybrid solution while literature focusses either on online or offline retailing. Furthermore,
retailing characteristics highly differ per country, which makes general literature less applicable. To
mitigate this limitation, reliable secondary research was added to support the design decisions.
Interviews allowed for specific information, however, since the number of reviews and the selection
of interviews are limited, the representatives of these interviews can be questioned. Assumptions
regarding generalization must be done with care.

Regarding the design variables, scientific sources supporting the design variable assessment were used
limited. For selecting the values on the design variables, desk research and logical reasoning is mostly
used. The conclusions on these design variables should be done with care.

Two surveys have been conducted to fill in knowledge gaps which were identified in the design phase.
The surveys did provided valuable insights, however, their representativeness is not guaranteed. The
demographic characteristics of the sample were analysed and did not show major outliers. The consumer survey results on several questions were compared to other surveys to support the assumptions on its representativeness. The retailer survey only yielded 11 respondents which is too few to draw conclusions on.

7.6 Recommendations

Current platform related literature such as two-sided market publications do not describe new platforms accurately. Two sides markets mainly focus on homogenous networks, like the telephone company, or cross-side networks like credit card companies or Sony PlayStation. More recent platforms are peer-to-peer platforms like airBNB or Uber. These platforms do not fit well in current two-sided network literature. The proposed platform in this case is also from another kind because it focusses on a platform which is an add-on for the current market. The number of these platforms is increasing, fundamental research to these platforms could potentially lead to a framework with which new platforms can be designed successfully. This framework could be to other sectors which could enable firms in improving their value proposition.

Current enterprises experience negative effects from new platforms and the sharing economy. This has led to changing revenue models in larger companies. Bosch focusses on tools which can be used by multiple users in their lifetime and Philips offers leasing of lights. Internet lowers information and communication costs which makes these new business models possible. Small and medium enterprises may not have the capability of developing new business models, this asks for the development of methods which enable those enterprises to innovate their business models.

The whole concept of building a search engine for products can be further researched. This would include the gathering of data, further development of the algorithm, advanced search algorithms and technical design regarding software and hardware. A whole research topic could be devoted to this single aspect. Applying more advanced techniques could improve the accuracy and recall of the EAN based indexing.

7.7 Reflection

The idea of the platform is derived from a personal opinion that a platform seemed like a valid business opportunity. This research is used to deeply investigate the concept and develop it if the research showed its viability. My enthusiasm and role as city council member in Delft could both have an effect on all those people who were interviewed, questioned or approached by me about the platform.

Literature was abundant in many elements which makes the fundament of the whole research less strong. These elements were platform development, consumer behaviour in hybrid situation, brick-and-mortar retailer motivations to enter online sales. This lack of literature, required explorative interviews, validating interviews and surveys from both the retailer and the consumer perspective. This broad and shallow approach did not allow for in-depth analysis. The critical back-bone of the platform, the gathering of data, had to be researched by conducting experiments. Also the many types of results through information gathering are a broad but shallow analysis. Though the large part of the explorative research could be used as an input for further research.

The research contained much information and many examples on the city of Delft. The questions is whether this study is representative for other cities, regions or countries. Another important element
regarding the representativeness is the facts that this study represents a moment in time considering the high speed of change where the retailing business is currently coping with.

Furthermore, the platform is very complex and highly dependent number of users of each side. Managing the sides in a platform is complex, especially in solving the chicken-egg-problem. If the critical mass cannot be achieved within the required time scope and available money, the platform will fail. The sources of failure and success are hard to determine. No matter how well the design is, the success of the platform is dependent on the very first phase of user generation.
REFERENCES


Civic consulting, 2011. *Consumer market study on the functioning of e-commerce and Internet marketing and selling techniques in the retail of goods*, s.l.: European commision - Executive Agency for Health and Consumers.


Daily Mail, 2011. The male urge to shop: Men spend more than women on items they buy on a whim. Daily Mail, 16 May.


Intomart GfK, 2013. Een andere kijk op online ondernemen. Deel II De online consument, s.l.: s.n.


Oskam, P. H., 2014. Enabling the Hybrid Retailer: Platform to support retailers in their online presence. Faculty of TBM: TU Delft.


Appendices

Appendix A: PLATFORM BENCHMARK BASED ON LITERATURE

PLATFORM BENCHMARKING
Several different shopping platforms exist. Though each platform has different design, purpose or aims. This chapter will investigate the characteristics of the existing platforms. The characteristics are chosen with the perspective of developing a platform for city centre retailers. The selected comparison criteria are

- Origen
- Type of goods
- Type of retailers
- Type of consumers
- Retailer differentiation
- General success factors?
- Possible factors for our platform
- Aspect not suitable for our platform.

The platforms which are examined are.

- Ebay
- marktplaats
- thuisbezorg
- Amazon
- Bol.com
- beslist.nl
- google shopping
- craigslist
- Atomic mall
- ecarte
- ruby lane

Similar initiatives which were included in the benchmark are

- Voradius
- web-shop oss
- “the new shopping” – “het nieuwe winkelen”
Appendix B: DATA ACQUIRING

EAN codes

http://www.product-open-data.com/
http://www.upcdatabase.com/
http://openfoodfacts.org/
http://www.dukten.com/
http://www.mynetfair.com/
http://www.ean-search.org/
http://www.barcoo.com

Google search API

Image

Tests
Appendix C: INTERVIEWS

In Delft alone, 17 retail association exists. 11 of them are bounded to retailers one or multiple streets. Furthermore there is a hospitaly branche association, Small medium enterprise association, entrepreneurial fund, Centre management, shopping mall association.

ARJAN STEENDAM

<table>
<thead>
<tr>
<th>Date</th>
<th>June 6 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>2:10</td>
</tr>
<tr>
<td>Location</td>
<td>Steendam herenmode, Delft</td>
</tr>
<tr>
<td>Function</td>
<td>Shop owner of Steendam Herenmode Chairman of retailing association de Klis</td>
</tr>
<tr>
<td>why</td>
<td>Arjan is chair of the biggest retailing association within Delft and is currently looking for new opportunities for his members. Arjan himself is active in online sales besides his offline store.</td>
</tr>
</tbody>
</table>

Main learnings

The idea of a platform is very good and welcome in the city of Delft.
Three types of stores.
- Small, not digitalized. Hard to get onboard
- Small-medium digitalized. Willing
- Large enterprises – not willing
Implement it in phases
Pictures are very important
Embed city experience
3 types of consumers
- Day tourist(50%)
- Fun-shopper
- Run-shopper
Retailers must distinguish themselves but the platform should display a way of uniformity

General introduction

Arjan, voorzitter van de winkeliersvereniging de klis. De klis representeert 20% van alle winkeliers van de binnenstad in Delft. Arjan is een jonge ondernemer en heeft de herenmode zaak overgenomen van zijn vader. De winkel is al aardig digitaal, zo hebben ze 2 niche webshops en 1 generieke die het product assortimeten van de winkel weergeeft.

1. Steendam.net
2. Steendamwebshop.nl
3. Shop.steendam.net

Welke platforms zijn er voor u in de aanbieding en welke ervaringen heeft u daarmee?

Om meteen de diepe in te gaan, geeft Arjan aan dat er meerdere valkuilen zitten aan platforms. De eerste valkuil is dat het van cruciaal belang is dat er een juiste koppeling is tussen de voorraad in de winkel en de online omgeving. Dit geld ook voor prijs, beschrijving en foto. Zonder een goede koppeling hiervan, is zo een platform niet haalbaar. Arjan heeft naar eigen zeggen een goede koppeling maar dan nog zijn er discrepanties. Er is al een initiatief dat modezaken aan elkaar koppelt wat localsonline heet. Wat deze partij heel erg goed doet is dat zij alle fotografie en product beschrijvingen doen. Binnen hun
website resulteert dit in uniformiteit. Locals united kan gezien worden als platform en heeft als verdienmodel het heffen van een fee op de verkoop die via hun loopt. Deze fee hangt af van het productaanbod. Voorlopig zijn de inkomsten vanuit de online markt nog geen 10%

Hoeveel en wat voor winkels gebruiken hebben al een (deel van hun) verkoop kanaal online?
Binnen de delft is het heel erg divers. Eigenlijk zijn er 3 typen ondernemers te onderscheiden:
1. De kleine zelfstandige die niet online is
2. De kleine zelfstandige die het redelijk voor elkaar heeft en een groot deel al geautomatiseerd heeft.
3. Het grootwinkelbedrijf dat eigenlijk alles al voor elkaar heeft.
Bij de eerste groep zitten de problemen. Deze krijg je niet zo snel mee. Deze groep beschikt vaak zelfs niet eens over een lijst van producten die zij verkopen maar doen de meeste dingen nog op papier en bestellen dit bij de leveranciers. Deze leveranciers zijn niet representatief voor het assortiment. Het assortiment opvragen bij deze leveranciers zegt niets over wat zij in de winkel hebben liggen.

De tweede groep bereidwillig om in dit soort platformen te stappen maar ook hier moet er vaak een betere administratie gedaan worden samen met een betere automatisering.

De derde groep zal niet in het platform stappen. Binnen de stad en winkeliersvereniging heb je er ook niets aan. Je kan hoogstens het assortiment van hun eigen website afhalen maar zelfs dan loop je nog tegen het probleem aan dat niet iedere winkel alles heeft van wat er op de website staat. Dit probleem zal je moeten tackelen

Hoe ziet u de toekomst van winkels van binnensteden en hoe verhoud zich dat binnen de huidige veranderde Retail landschap.

Deze specifieke vraag is niet gesteld.

Wat ziet u als voordelen voor winkeliers?
De voordelen voor een platform zijn tweeledig. Enerzijds kan het dienen als direct verkoop kanaal en andere kant een stukje online reclame voor de winkel. Dat tweede is niet te meten maar het gebeurt meermaals dat er klanten in de winkel aangeven dat ze zich eerst georiënteerd hebben op de website.

Wat denkt u dat de voordelen zijn voor consumenten en hoe kunnen deze consumenten getriggerd worden het platform te bezoeken.
Er zijn twee typen consumenten. De dagjes toerist die zich wil oriënteren op de stad delft en de inwoner van Delft die graag wil weten waar iets in het centrum te koop is.

Hoe denkt over het betrekken van de totale lokale economie bij het platform. (Voorbeeld) Korting bij horeca bij aanschaf product?
Ik denk zeker dat het stukje stadsbeleving meegenomen moet worden in het platform. Of het samen aanbieden van een kopje koffie bij de buren geïntegreerd moet worden weet ik niet. Het gebeurt nu al en tenslotte blijft een kopje koffie offline. Kopje koffie niets te maken met online. Scoopy is bijvoorbeeld een aanbieder die dit realiseert

In hoeverre hebben retailers de mogelijkheid zichzelf te onderscheiden binnen het platform.

Je moet wel een zekere mate van uniformiteit uitstralen anders wordt het een zooitje. Wat goed zou zijn is dat je een introductie van iedere winkel ziet met bijvoorbeeld een paar producten. Wanneer je dan verder klikt naar de winkel, dan zie je steeds meer de identiteit van de winkel.

Bij het zoeken moeten de juiste winkels naar boven komen, ze hoeven niet per se dit product op voorraad te hebben. Wanneer je dus een indicatie op basis van keywords hebt welke items een winkel verkoopt, dan kan je al goed zoeken.
Design variable: Which retailer process steps can be fulfilled by the platform?

Je hebt natuurlijk een aantal stappen van display van producten naar volledige afwikkeling. Niet iedere winkel is even ver met de automatisering dus dit zal per winkel verschillen. De winkels die verder zijn, daar kan je steeds meer verder doorklikken totdat je uiteindelijk bij de eigen website komt.

Design variable: Which product(types) need to be displayed

Dat maakt niet echt uit

Design variable: In which degree can we include other entrepeneurs?

Reeds beantwoord.

Design variable: Which effort needs to be put in the platform by the retailers and which by the owner?


Zoek naar een manier can Co-financiering. Laat bedrijven, belanghebbende en jijzelf een investering doen.

Boekhandel huizer... doet aan local bezorging.
Platforms in general.

Yvo is currently using the Chainels Platform. This a platform from and for entrepreneurs and allows direct communication through a web platform within a city region. In this way entrepreneurs can communicate easily. The platform provides an API which developers can use to extract data from entrepreneurs. Currently 20 entrepreneurs are associated, the wish is to expand to whole Delft. Yvo uses is the spread ideas and communicate with it with use of polls. The platforms also provides a way to send newsletters. Another function are Alerts to all retailers when a thief is active. There are still retailers who are not willing to adopt these platforms because the see low opportunity costs. Those are small retailers 60+ who have seen their pension vanish.

Consumers

Decreasing sales is mainly driven by different consumer behaviour. Large firms are not investing in Delft because they focus on larger cities nearby. The target group for consumers are the day-tourists come from delft, region or from somewhere else. We have to define our focus and which customers we want to address. We want to embed core values and history, creativity and technology.

Other entrepreneurs

Currently Yvo is suggesting several restaurants in the area. Other entrepreneurs are not willing to do this because they see at as competition. What we need to do is cooperation, in this way we can improve our service. On the long-term this yields more success. On a big scale, Delft needs to be promoted about what you can do here in Delft. That is the way to remain a low percentage of shop vacancies.

Current digital activities

A web shop is not the added value for my shop. My current revenue from web shop is 7% but is growing fast. My vision is not that everybody set ups his own shop. We have to promote Delft through our websites, and not selling products. In web shop we cannot trigger all senses, the web is pure visuals. There are 2 type of customers. Those who orientate online and buy the product and those who can
discover new shops. People have to come to Delft, that’s the main focus. Local-to-local delivery is option for consumers so that they not have to drag with all those shopping bags.

Yvo is familiar with “The new shopping” and with Cor Molenaar. He attended many meetings where these initiatives are advocated. He recognizes the immense innovation in life, retailing has to adapt to it. The concept is already 4 yours old and needs to adapt. We cannot get away from the new techniques. The distinguishing factors is how retailers are using the technologies. You want to have customization and not annoying commercials. Our added value is: When you buy this trousers, I can give a parking card, museum night card or a night out to the movie with your girlfriend. The added value is not by providing discounts, but by delivering additional services. We are currently developing a CRM system to enable this. Main focus remain to attract more customers to the shops. But what does the consumer want? That is important, not what the retailers wants, they are conservative.

Currently some books are printed which show the offering of shops within Delft, including some voucher. A lot of effort has put into it, but the question is who is going to read it? If they read the book, they are already in the city centre.

Main problem is: How to search for something if you don’t know what you are looking for. If you know you want to buy pants, you are completed phase 1. Many customers visit a shop without knowing what they need. In a shop, customers can triggered in the sense that they do want a product. Many customers. Delft is offering services, which customers don’t know they are offered for. Yvo want to join the platform if it offers him more traffic in his shop. I have no problem with other retailers on the platform, as long as the customers come into my shop. But not every retailer is saying the same. Best scenario would be if you search for Jeans that the first hit is Delft, because delft offers 30 shops who sell jeans.

Availability of digitalized information

I only have a number, price and short name digitalized. But then I don’t have images. Images are available at the suppliers. Mexx has a budget of 200.00 to have their product in the top, while small retailers only a budget of 1000 per month. With fashion stores, each month we get new products. I am very well automated. In my street of 9 shops only 2 or 3 shops have a automatized their products. Fashion stores are not particularly more automated than other shops. Automatization has to do with mind-set of the retailers. If I send a list of article codes to Mexx, I get all the images in return.

Implementation

Beware that technology changes rapidly. Currently apps are hot, in 3 years they are outdated. Beware of changes in environment and technology. Make sure that platform can adapt to these changes. For example, Delft is developing Free Wi-Fi... But almost each phones HSDPA or 4g which makes Wi-Fi Obsolete. Why should you develop Delft maps if google maps exists? Focus on responsive sites instead of apps. They are easy to access, develop and phones get better browsers.

When I enter Delft in google. I see the government website. Number 2 must be this platform. Check on postal code what the origin is of the shopper and display different content. Tourists must see museum, events and general information. Residence must see more detailed product information and shops. Delft as theme park, experience, boats and other activities.

Cooperation
Before the retailers are changing, first 50% of them has to go bankrupt. I see further possibilities in collaboration. The shops are only a showcase for shirts, a then delivers the shirt the next day. Be aware that you won’t become your own competition. Lower pricing is competing with your own more expensive products. Further integration of technologies can show the full product life cycle. If a persons want a specific item, which is not in the store, and I cannot order it at the supplier, and he uses his smartphone to search for another shop where the shirt is in stock. That is strange, why can’t we share the stocks? But with a bad luck, elsewhere the shirt is cheaper. With this cooperation, I see and development. Mexx is currently offering retailers to have its own web-shops, the Mexx web-shop with my own logo.

**MICHIEL KRAAIJEVELD**

<table>
<thead>
<tr>
<th>Date</th>
<th>10-06-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>70 minutes</td>
</tr>
<tr>
<td>Location</td>
<td>City hall Delft</td>
</tr>
<tr>
<td>Function</td>
<td>Chairman of small and midsized business delft (MKB Delft)</td>
</tr>
</tbody>
</table>

**Main learnings**

- Keep lean and mean organization.
- Cooperation is essential
- Combination with retailer, coffee and dinners work
- Retailers acknowledge that they have to cooperate
- Don’t make expectation to high. Platform will not double revenue but is an added extra service.
- Entrepreneurs want to hop on a moving training when it improves sales, or limit damaged. Offer a plug and play solution
- Embed the value of the individual entrepreneurs
- Embed city experience using images, video’s and social
- Make connections with events
- Don’t give discounts on the product but give discount on his presence
- Focus on the most important aspects as platform owner, retailers should perform less important tasks.
- Focus on equality between retailers. Don’t make price fees to divergent

**Platforms**

I initiated the program “Delft earns online”. What I noticed is that Delft has the things right. We have nice shops. The city centre is OK, historical values, great proposition, limited vacancies but what is missing is online presence. I attracted professor Cor Molenaar from the Erasmus University. He can be seen as guru in city centre marketing and e-commerce. You need to focus on elements which make Bbol.com and Zalando redundant. By cooperation, keep the organization lean and mean. Delft can be a pick-up point for online sales. I try to enable the entrepreneurs to together develop a new value proposition to consumers. The container word is “experience” It’s old and word with many critics but that is the core value of cities. Shops as being there, Guus Meeuwis are looking for opportunities in generating more traffic in their shops. They made a combo with the Argentina steak house and belvedere to drink coffee. Those concepts work well and what we want to emphasize in our organization. Retailers are more often acknowledging that they cannot do everything on their own, I want to enable those retailers in these concepts.

Offerings as coupons need to be printed, distributed, counted and monitored. Some organization is need, but retailers want to spent minimal efforts on coupon. Retailers are only willing to put effort in this when they think their consumer will really appreciate it. But embedding this requires many implications. Always make the trade-off between efforts and added value of the service.
Platforms, in this form or any other, are the future. Internet in retail is a fact, we need to adopt it. Some retailers are not willing to adopt because they are almost with pension or fear. Don’t make high expectation of the platform. It will not increase sales, but maintain the same revenue. It must be seen as an extra service. The scepticism amongst retailers is hard to determine, we have 300 entrepreneurs, mainly hospitality services, and many of them have their own website. Only 10% is putting serious efforts in online presence. The main barriers for the 90% is the fact that entrepreneurs want to hop on a moving training when it improves sales, or limit damaged. You have to offer a plug and play solution. Retailers have to step over their own shadow. For the entrepreneurial nature, they look at their own situation. We are developing programs which eventually lead to the development of platforms which is suggested in this thesis.

Retailer distinction in platform

There is no feeling behind a pure product offering. The power is entrepreneur behind the website, you have to show that. You have to get more feeling of individual entrepreneurs instead of the big online website. I believe in events where connections are made. Social media: winter collection together with an event in the city. Use images and videos. Stimulate consumers or retailers to upload videos or images which show this feeling. Don’t limit yourself to text and products.

How can we make sure that we do not have to tell consumers that they have to buy at my shop because I need to make a living out of it, but instead offer a better more ease, product catalogue and experience? The amount of persons in the city centre is huge compared to other cities.

Other services

Local-to-local delivery is and option. Discounts through the platform are possible when a retailers thinks he can improve his net revenue. These days it’s all about discounts, but that not a good value proposition. We have to offer something extra above online shops. Online viewing is nice, online purchasing is a hassle. Don’t give discounts on the product but give discount on his visit.

Allocation of efforts

What is the balance between efforts of the platform owner and retailers? Make one line. If retailers performs his own indexing, no consistency is present. Everybody can scan a barcode, but not everybody can select the best images. Everywhere where image quality is needed, a platform owner must perform a check. Focus on the most important aspects as platform owner, retailers should perform less important tasks. The platform owner is more efficient in performing these tasks. Tasks performed by the platform owner has a financial consequences for retailers. We have 350 entrepreneurs, multiply that with 20 euro’s and you got a nice monthly income. A classical mistake is: With low contribution, people maintain member but we have no resources to develop. With high contribution of 200 euro’s, you can developed but you have to deliver to maintain the members. Everybody has to pay the same fee. Focus on equality. If you get more presence, you pay more but don’t make the difference to high. You must explain the difference of visibility to a retailer which pays 10 euro’s and to 100 euro’s. Many platform owners are only focussing on the revenue model, this is not working.
Current initiatives are present focus on digitalizing shops in the form of: “Clicking on a product and I see an advertisement”. I hope you do more than that. With the initial explanation, Joost was not able to see the “new idea” in the concept.

It is important to distinct users who need a specific item (present, drilling machine) and impulse purchase. There are not many consumers who are searching for 1 specific product. **There are 2 types of consumers, those who search a specific product and those who are walking around and make impulse purchases**

The *grant factor* is very important. Consumers may prefer to buy a book at the local store because they grant the purchase to the local retailer. You enter a shop, because you think you will like it. This can be grant, or marketing. “Without even knowing a bar, you judge on first feelings to skip the bar and go to the next one”. Embedding this factor is important

Joost is chair of the platform city centre Delft. There are 13 organizations who all have to judged about initiatives. There are two very large funds: SCMD (Stichting centre management Delft) and the entrepreneurial fund. In order to use those funds, consensus amongst all retailers must be present. Therefor the organization BOB (bestuurlijk overleg binnenstad) was initiated representing al organizations. Within the city centre, there is a high degree of disunity. Former city alderman had made the mistake to give many credit to another initiatives in the city. Such as “tussen de geveltjes” and OBD. This initiative never reached success but other organizations were not supporting mainly due to the disunity. OBD is initiated by property owners who want more revenue out of their properties. Main figures in the city are Herman Weijers and Ronald vis.

Retailers and other organisation have to cooperate. The market square organizes such events in cooperation and is a success. In total there are 15 regions in city centre, currently 5 are united and will likely to be 10. Each entrepreneur in the city centre pays his housing tax to the entrepreneurial funds. The BOB makes decisions what to do with the fund. That is the incentive for all individual organizations to cooperate within the BOB. Of course, the general vote will be held as well for those who are not organized. The focus of BOB is specifically chosen for areas, and not for branch. Location is what unites more.

The biggest pitfall for the platform is thinking that chairs of organizations are doing the acquisition of new members. As platform owner, you have to visit each individual retailers. The power of the platform is when almost each retailer is present. Horeca has a very strong relationship with retailers and are important to embed. Another pitfall is that retailers are going to compete within the platform. If one retailers pay’s more for an advertisement, the other retailers we complain. Include everyone, and do not make distinction between retailers. All retailers are welcome, if a retailer is not present, people must know that it is his own fault. The only books (with information about the city) are those which did not require a fee). The same problem is found with price comparison websites. If consumers notice that their prices offered are not the lowest because only affiliated website are on it, than this brings distrust. Maintain the idea that the platform is objective for all retailers.
Let’s zoom in the reason why retailers only participate if they do not have to pay. Most retailers are not high skilled. Anticipating on expected revenue is not a good quality of those retailers. Disclose free riders. They all want Santa Claus, but are not willing to contribute financially. We must always be able to answer the questions “What do I get in return for my money?”

28:20 in recording, Joost offers the financial structure and funds to the platform. An idea is to subsidize everything for each retailer, and after one year each retailer may choose to either continue or leave. Focus on a smaller area could have a benefit as well. If you represent the best group of delft, consumers think “What an amazing city is Delft, and this is only a part of it.”

Many initiatives are done within cities. Most of them are focussed on publishing books, websites or events. You have to make clear that this platform is different than the rest of the initiatives. I must answer the question: “What do I get in return”. You have to address the needs and wished on the retailers. They must be involved in the design process. The message must be: “If you don’t participate, you will lose in the long-term”.

Regarding the financial viability, what is the most viable revenue stream? Investments, commission etc.. The fund will ask the first question: what do bring in. Do I also have a risk. Bank investment, personal investment? The fund is more willing to investment, if I already got 10 entrepreneurs stating that they want to participate. Make clear why this platform is unique, and that not some else can developing the same idea.

Information detail. Branch level or individual product level. That is less important. What more important is to show the best companies of Delft. Than the retailers will say “Why am I not included?”. This is an incentive for other retailers to include. Another approach might be to start with a specific region, de Klis. Start with the approach of the most historical part of Delft. Other regions will become jealous and will join soon after. The problem owner has to solve the problem. Make the other retailer aware of the problem and the solutions. The Klis is good cooperation to start with since they have money. The Breestraat and Zuidpoort for example have no money. Start with a pilot for minimal costs. It is very hard to reach all entrepreneur in the city at once.

Intern we have to goals to gather all entrepreneur of the city centre 2 times a year. I strongly have to need to propose something which we can create something. We need more initiatives, and the platform can be one of them. Currently a communication platform is present in the city but is not used by many retailers. Retailers get confronted by many offerings, and almost always say no. The good ideas suffer from the overload of bad ideas.

You can either focus on popular or special products. Retailers which offer special products are for example seven days more living, Atembo and the paint shop at the Beestenmarkt. The retailers deliberately placed itself in the historical centre. A more critical retailer is for example: ’t pauwtje. He sells unique products but is not digital active and sceptical. Peter van bul supper in de Breestraat is a retailer which would be the most interesting to interview. The shop in unique and the Breestraat is not benefiting from the city centre.

It’s also important to focus day tourists. In delft we have Delft marketing which is promoting the city centre of Delft. They focus on how to map the city of Delft. Former initiatives took place in digitalizing these shops. The platform owner should make a use case: “What will I do when I visit Delft for one day”. You have present objective information to consumers. The platform should be user driven, and not money driven by organizations. Amongst the retailers, there are needs to have a initiatives such as the “9 straatjes” in Amsterdam. We should bot copy this initiatives. Two things are important. That
important is that this initiatives is a hub of the city with walking routes and that in 5 years Delft is the best retail city.

What are the current actives in implementing digital activities in Delft? Retailers are not very enthusiastic about digital projects. Bars and restaurants are more positive since they sell more of an experience instead of a product. The question is whether each shop or bar really needs a website. Many bars are not having I website and I truly don’t know if this has an effect on the sales. At least , you must be findable online. Embedding the hospitality sector in the platform is not easy. Current cooperation’s are based on trust. As a luxurious bar, you don’t want to be compared to low-profile shops.

**MARIAN DEN BOER**

<table>
<thead>
<tr>
<th>Date</th>
<th>12-06-2014 14:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>46 minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Tourist information point</td>
</tr>
<tr>
<td>Function</td>
<td>Marketing expert at Delft city marketing</td>
</tr>
<tr>
<td>why</td>
<td>Budget rights Vision on Delft marketing Heavily involved in centre management delft</td>
</tr>
</tbody>
</table>

The conversation started with a discussion not about the platform. This discussion made clear that there is quite a lot of rivalry in the city. Cooperation is hard to achieve. Some key figures control Delft in a negative manner. Old relations, habits and events still causing a lack of cooperation.

Tussen de geveltjes heeft al een soortgelijk initiatief, Chainels. De ondernemers achter Chainels lijken een soortgelijk idee te hebben. De behoefte van zo’n platform is er wel duidelijk vanuit ondernemers zelf behoefte aan. Chainels is meer een samenwerk en communicatie platform. Je kan hierop stellingen en enquêtes publiceren. Dit is wat anders als het platform wat in dit onderzoek wordt voorgesteld, maar ook Chainels is met dit soort ontwikkelingen bezig.

Het gevaar is dat de BOB lyrisch is, en de ondernemers niet. Dan is er alsnog geen draagvlak en wordt er in de verkeerde projecten geld gestopt. Het moet niet zo zijn, jij hebt idee en jij voert het uit, maar de ondernemers moeten het zelf dragen. Je kan financieringen aanwenden vanuit gemeentelijke organisaties, maar draagvlak vanuit ondernemers is essentieel. Dit wordt nu bijvoorbeeld gedaan met werkgroepen waar ondernemers zich voor kunnen opgeven. Ook hier is een bottom-up benadering veel beter. Probeer een werkgroep te vormen met front-runners die achter het idee staan. Kies deze groep wel bewust, deze front-runners kunnen mensen afschrikken of aantrekken. Yvo Sonneveld is zo iemand die een werkgroep kan zitten.

Buiten dat de ondernemers er achter moeten staan, moet de platform eigenaar er ook achter staan. Er moet een goede boterham aan verdiend worden omdat anders jij meteen weg bent. Dat vertrouwen moeten de ondernemers in je hebben. Het is een pre dat de platform eigenaar raadslid is en zo betrokkenheid bij de stad toont. Ondernemers kijken wel wat het oplevert onder de streep, maar aan de andere kant moet de platform eigenaar er goed aan kunnen verdienen.

**LEON DE BAKKER**

<table>
<thead>
<tr>
<th>Date</th>
<th>4-11-2014 10:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>49 minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Thuis in</td>
</tr>
<tr>
<td>Function</td>
<td>Owner of “Thuis in” Small hospitality service proved</td>
</tr>
<tr>
<td>why</td>
<td>Get insights in embedding other entrepreneurs in the platform. Leon is owner of a small food oriented café</td>
</tr>
</tbody>
</table>
Momenteel zijn voornamelijk online actief met kortingen middels Groupon. We bieden een high tea omdat de kostprijs laag is. De marge van Groupon is heel laag. Er moet 50% karting zijn, waarover Groupon nog eens 30% inhoud. Leon doet dit vooral voor de marketing, het is de goedkoopste marketing die er is. Het effect is ietsje minder geworden, je kan niet iedere keer hetzelfde doen. Van de 900 tafels van de eerste ronde heb ik veel terugkomende klanten gehad.

Een combinatie met andere winkeliers is lastiger. In heb begin heb ik bij de schoenenzaak en juwelier bonnen gelegd. Wat ik kan weergeven via zo een bon is te weinig. Mensen komen niet voor een kop gratis koffie bij een gebak, dat is te weinig. Enkele keren geprobeerd maar het werkt niet. Ik moet alsnog geld verdienen en kan dus ook niet te veel geld gekregen. Ik heb 200 bonnen gemaakt, waarvan ik maar 20 klanten heb gekregen. Netto leverde het te weinig op om mee door te gaan. Mijn zaak is minder geschikt hiervoor dan bijvoorbeeld een restaurant. Andere samenwerkingsverbanden heb ik nog niet geprobeerd, ik behoor nog niet tot de gevestigde orde.

Veruit het grootste gedeelte van mijn klantenbestand zijn passanten. Dit percentage is ongeveer 80% en in de zomer meer. Er komt niemand specifiek om naar mijn zaak te gaan. Ik zie geen terugloop bij de horeca en ook geen verband met een teruglopend winkelend publiek. Delft is misschien hierin unieker dan andere steden met een mindere aantrekkingskracht. Het aantal horeca zaken groeit, voornamelijk om dit nog het enige wat nog mensen trekt en rendabel is om te beginnen. Een gevarieerd aanbod tussen winkels en horeca is belangrijk.

Een online platform waar web shop in staan, is het hartstikke leuk om te zien wat de stad nog meer te bieden heeft. Ik begrijp alleen niet als het platform er voor zorgt dat je thuis kan winkelen, waarom het dan interesting is dat je 2 euro korting krijg bij een bepaalde restaurant. Je zou meer een grappige combinaties kunnen denken. Bij de aankoop van een pak zit ook nog diner bon. Ik zou wel graag als horecaondernemers mijn producten willen aanbieden. Ik verkoop koekjes, speciale koffie etc. Niet per ‘se om te verkopen maar wel als zichtbaarheid. Ik ben daar niet zo mee bezig nu. Maar de buurman verderop bied wel levering via DHL aan, dit werkt heel erg goed. Ik denk dus dat deze lokale bezorgen bij kan dragen. Je moet je wel afvragen wat je doel is, meer uitgaven of meer zichtbaarheid. Ik zou zelf meer traffic in mijn stadsgedeelte willen zien.

Dit platform zie ik wel toegevoegde waarde als voorbestemd zijn voor de toekomst. Ik merk nu al dat er heel veel last-minute digitaal gedaan wordt. Ik snap goed dat je een nieuwe groep klanten aanspreekt. Simpelweg omdat ze je nu kunnen vinden en niet naar een alternatief grijpen. Als het doel exposure is, dan wil ik wel betalen per exposure. Een pay per view methode is dan het meest aantrekkelijk. Ik maak nu al gebruik van deze service. Ik betaal 7 cent per klik en geeft 3,50 uit per dag maximaal aan uit. Totaal per maand kost dit 75 euro en krijg hier veel traffic van. Ook al zou ik aan het platform 35 euro per maand uitgeven, dan zou ik liever pay per view willen. Bij google kan je nog geavanceerde functies instellen maar dat kost dan wel 25 euro per maand. Dat heb ik dan ook niet gedaan. Een ouderwetse krant zeg ik niet zitten, dan bereik ik alleen maar het bejaardentehuis.

Momenteel bezorgen wij bij mensen thuis. Een local-to-local delivery optie zou ik dan wel fijn vinden. De prijzen variëren per afstand. Ik bezorg ongeveer 4 of 5 keer per week. Binnen het platform vind ik het wel belangrijk dat je de persoonlijke kant van de ondernemer ziet. Ook het gevoel van iets lok
aals kopen moet terugkomen. Dat zie je steeds vaker met streekproducten. Met deze boodschap heb je ook meer kans op investeerders.

Er zijn vele partijen die iets proberen neer te zetten maar het faalt vaak. De lancering is heel moeilijk, het resulteert snel in ruzie. Er zit veel geld bij buurtvereniging de klis. Er wordt heel veel uitgegeven aan planten, verlichting, etc... Dit soort initiatieven kunnen er prima mee gefinancierd worden. Het is belangrijk om te weten hoe je het brengt, waar geld zit en welke personen je moet benaderen. Het vertrouwen in de platform eigenaar moet groot zijn. Het feit dat je raadslid draagt hier aan bij.

**HUGO OVERVOORDE**

<table>
<thead>
<tr>
<th>Date</th>
<th>18-10-2014 10:30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration</td>
<td>35 minutes</td>
</tr>
<tr>
<td>Location</td>
<td>Stadscafé de waag</td>
</tr>
<tr>
<td>Function</td>
<td>Owner of “Thuis in” Small hospitality service proved</td>
</tr>
<tr>
<td>why</td>
<td>Get insights in embedding other entrepreneurs in the platform. It is a large, old and establish restaurant. Focussing on dinners and late drinks</td>
</tr>
</tbody>
</table>

Binnen Delft komt er steeds horeca, maar de stad is gebaat bij diversiteit. Horeca en winkels vullen elkaar aan. Mensen komen ook naar de stad mede omdat er horeca is. Ik werk nu al samen met Yvo Sonneveld en de Leeuwoptiek. De actie met de leeuwoptiek was dat wanneer je een bril kocht dat je koffie en appeltaart bij de waag krijgt. Achteraf word ter een rekening gestuurd voor de normale prijs. Deze actie liet heel erg goed. Er worden wel acties gedaan die we in gezamenlijkheid toen. Zo heb je veel meer bereik en effect. Dit soort aspecten dingen werken goed en kan het platform in ondersteunen. We begonnen met 3 ondernemers samen te werken en dit zijn er vanzelf 14 geworden. Te veel ondernemers leidt tot vertroebeling, iedereen wil ze zegje doen, eigenheimers. Het moeilijke in het platform is om met veel mensen, veel meningen en hoog budget dat het te complex wordt en zijn identiteit verliest. De input van de ondernemers in termen van kosten waren compleet vrij gelaten, om struikelblokken te vermijden.


Samenwerking tussen ondernemers is een aandachtspunt. Er kunnen deals gemaakt worden over de prijzen die er voor loyal-tee’s gebruikt worden. De prijzen die je kan hanteren zijn sterk afhankelijk van de marges die je maakt op een product. Voor een blikje drinken ga je net omlopen, dit is wel afhankelijk van je doelgroep. Bovendien moet je ook kijken wie er samenwerken. Een luxe horecazaak moet niet geassocieerd worden met een euroland. Buiten het associëren, versterken we elkaar ook niet. Dit geld ook voor de winkeliers. Als je in eerste instantie 50 retailers of horeca mensen wil hebben, zoek ze heel specifiek uit. Bij voorkeur mensen een naam. Stel gewoon een X aantal plekken beschikbaar, de mensen die het graagst willen komen als eerst. Selectie is essentieel.

Er zit zeker waarde in het platform, als dit meer bezoekers genereert. Als consument zie ik er meer toegevoegde waarde in als je het koppelt aan iets bestaands. Weer iets nieuws zit ik persoonlijk niet zo op te wachten. Je moet laten zien wat er in de stad te doen is qua evenementen, horeca, producten en niet zozeer specifieke producten.
Tjan uses google places to promote his business. He has a very advanced profile on this google shopping place with inside pictures. People can walk virtuallly trough the shop. Costs of embedding is street view in a shop are approximately 300 euros for a small shop.

Tjan has about 250 products all in a high price range. Barcodes on the products are very small since space is limited. Price tags are placed over the barcodes. Tjan is very enthusiastic and told that from now on he would place his price tags on a different spot.

Tjan has absolutely no digital information on his products. Each Friday he checks which products are sold and then just re-order the same items.

Tjan’s unique selling point is service and location. I offer many additional services when someone buys a watch. For example, I adjust the wristband to the client wrist, this is not possible at a web shop. I also give a live-long guarantee on replacing the batteries for free. Changing a battery usually costs 5-10 euro’s. The costs are only a few cents and I get the opportunity the speak to my customers again.

Tjan sees his shop as very suitable for a platform solutions. I am selling products who people want to experience. If I have the possibility of generating more traffic in my shop, then the platform is of added value. I want that customers select me above the more general large firms.

PRAXIS (INFORMAL)
From interviews with employees we can learn that shoppers use these service to reserve products with discounts, sometimes products are sold out solely through internet purchases. The other user group are those who have larger orders and find it easy that the store collects the items and the shopper only has to pick it up.

HET PAUWTE (INFORMAL)
While conducting the technology experience, the opportunity was taken to have an informal overview. The results are that the shop-owner was very enthusiastic about the platform. She tried to use the beta version of the indexer herself. She quickly learned how to use it and concluded that she could do this process by herself. The technology has to be improved in order to make it useful for a broad range of users. The shop owner very much liked the idea of seeing high quality images of her products.
Appendix D: RETAILER SESSIONS

DELFT VERDIJENT ONLINE (DELFT EARN ONLINE) – 1
This meeting was very much focussed in creating your own webshop and all the rules according to this. Retailers stated that these rules were a real struggle. From my point of view, these presentation were a bridge too far. The number of retailers showed up were low. With many person I spoke about the platform, however no retailers were present which had a suitable product catalogue.

DELFT VERDIJENT ONLINE (DELFT EARN ONLINE) - 2
This retailing session was focussed on online visibility and cooperation’s. It was practically driven and showed the urge of adopting e-commerce in cities. Many retailers attended this sessions. The presenters advocated a platform like solution for the city of Delft. Exposing what a city has to offer is essential. The slides showed how the new consumers behaves and what his motives are. Scenarios for the future were sketched. Retailers responded very enthusiastic. In the after-sessions, many retailers and other relevant organizations acknowledged the potential of the platform. The first offerings of office space and money were made. The City alderman was interested and told that there are governmental funds available for the project.

NETWERK BINNENSTAD (CITY CENTRE NETWORK) – 1
Overview of the evening including parts of the pitch can be found on: https://www.youtube.com/watch?v=twaFudyesgk

PITCH CONTENTS:
Pieter Oskam. Raadslid D66, Ondernemer en momenteel aan het afstuderen bij Technische Bestuurskunde en Informatica. Voor mijn afstudeeronderzoek ontwerp ik een web platform voor winkeliers en andere ondernemers voor de binnenstad
Begin dit jaar kwam ik er achter dat winkeliers uit stadscentra gigantische kansen hebben. Iedereen in deze zaal weet dat webwinkel, en het web in het algemeen, zich stevig ontwikkelt en dat ten nadeelen van de huidige winkeliers in de binnenstad.


Consumenten veranderen ook. Mensen zijn verwend, shoppen en orienten vanuit een luie stoel en doen dit 24/7 wat resulteert

Dus: Een platform dat zoekkosten verlaagt, beperkte middelen van ondernemers vereist, inspeelt op de veranderende eisen van de consumenten en daarbovenop nog extra elementen kan toevoegen.

Waar het op neerkomt is een digitalisering van de binnenstad. variërend van een winkelprofiel tot een volledig product assortimenten online. Het platform als zoekmachine voor de stad.

Binnen 30 minuten een cadeau voor je moeder die jarig is. Die winkel ontdekken terwijl je eerst gewoon naar de V&D ging

Het platform de propositie van winkeliers verder verbeter door combinaties te maken met lokale horeca, evenementen, parkeren en allerlei andere dingen die het winkelen in een stad aantrekkelijk maken.

Ik ben zelf ontwikkelaar en wil ik het platform gaan bouwen maar daarvoor wil ik weten wat de bereidheid is van de lokale ondernemers om hier tijd en moeite in te steken. Verder sta ik open voor alle ideeën en nuttige input om samen. Delft op de digitale kaart te zetten.

NETWERK BINNENSTAD (CITY CENTRE NETWORK) – 2

This meeting was a general gathering of all city centre affiliated organisations and persons. In this phase, 2 major dilemmas were present. First was the pricing scheme and revenue of the platform owner and second was the retailer selections.

To answer the first dilemma. A commission based percentage of 5-15% is seen as most suitable in the later phase of the platform. Pay per view is more suitable Additional income might be by a so called freemium model. Free for showing products to a limited amount. Additional fee’s when the indexing is done fore for the retailers.

Selection is important for the platform but how to select is more difficult. Embedding larger enterprises creates a high start value for consumer but suppresses the smaller ones. Entrepreneurs acknowledge the dilemmas are allowing big firms on the platform, but it must be visible for consumers to distinguish them.
Appendix E: PRODUCT TYPE SELECTION

Table 23 shows a table which is used to determine suitable product types for the platform. The selection is done based on the three perspectives. A start was made by giving value of 1-5 depending on the fit. The product types marked in green are seen as having a high fit on the various perspective.

Table 23: Broad assessment framework for product type selection

<table>
<thead>
<tr>
<th>Branch / criteria</th>
<th>Consumer perspective</th>
<th>Technology</th>
<th>platform</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>search costs</td>
<td>shipping &amp; handling</td>
<td>product price difference</td>
</tr>
<tr>
<td>Groceries</td>
<td>1,64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vegetable Business</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Business in meat (products), game and poultry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Butchers</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>- Poultry</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>fishmongers</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Bread and pastry</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Cheese</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Specialist in tobacco</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Stores</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>- Tobacco and convenience stores</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Shops in foreign foods</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reform Affairs</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Candy and chocolate business</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pump Shops</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>supermarkets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fashion Shops (including shoes and leather goods)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Clothing Business</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Clothing Business</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Baby and children’s affairs</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoes Affairs</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General textile business (hobby)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body fashion Affairs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fashion - and jewellery business</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leather goods Affairs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>textile Supermarkets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shops in personal care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drugstores</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pharmacies</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>perfumery</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>jewellers</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opticians</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Home furnishing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Furniture Stores</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Home textile</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Mixed business</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Kitchen Specialist</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Cork and parquet business</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lighting Business</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bathroom and sanitary affairs (other DIY)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tiles</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Household</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Household article affairs</td>
<td></td>
</tr>
<tr>
<td>Mixed Affairs (mixed branch and toys plus hobby)</td>
<td></td>
</tr>
<tr>
<td>GPA Affairs (glass porcelain pottery)</td>
<td></td>
</tr>
<tr>
<td>Art and antiques trade</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Shops in consumer electronics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>White, brown and gray estate business</td>
<td></td>
</tr>
<tr>
<td>- White and brown goods business</td>
<td>3</td>
</tr>
<tr>
<td>- Telecom Stores</td>
<td>3</td>
</tr>
<tr>
<td>- Computer Shops</td>
<td>3</td>
</tr>
<tr>
<td>Optics, photo and camera’s</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Do it yourself business</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Building</td>
<td>2</td>
</tr>
<tr>
<td>Paint and wallpaper business</td>
<td>2</td>
</tr>
<tr>
<td>Hardware- and tools business</td>
<td>2</td>
</tr>
<tr>
<td>Wooden building materials and garden</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Education and leisure goods</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Home entertainment business</td>
<td></td>
</tr>
<tr>
<td>- Video Stores</td>
<td></td>
</tr>
<tr>
<td>- Bookshop</td>
<td></td>
</tr>
<tr>
<td>- CD cases</td>
<td></td>
</tr>
<tr>
<td>Music</td>
<td></td>
</tr>
<tr>
<td>Pet shops</td>
<td>3</td>
</tr>
<tr>
<td>Sports and / or camping business</td>
<td>4</td>
</tr>
<tr>
<td>Car accessory trade</td>
<td>4</td>
</tr>
<tr>
<td>Caravans</td>
<td>4</td>
</tr>
<tr>
<td>toy stores</td>
<td>4</td>
</tr>
<tr>
<td>flower shops</td>
<td>2</td>
</tr>
<tr>
<td>gro</td>
<td>3</td>
</tr>
<tr>
<td>Office and -vakhandel</td>
<td>3</td>
</tr>
<tr>
<td>Bicycle shops</td>
<td>2</td>
</tr>
<tr>
<td>Department Stores</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Retail not in-store</strong></th>
<th></th>
</tr>
</thead>
</table>

19
<table>
<thead>
<tr>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>street trading</td>
</tr>
<tr>
<td>- Market Trading</td>
</tr>
<tr>
<td>- Other street trading</td>
</tr>
<tr>
<td>Online retailers and mail order companies</td>
</tr>
</tbody>
</table>
Appendix F: PUBLICATIONS

2 X ONDERZOEK - EN WAT VINDT U?

Twee studenten, twee binnenstadsonderzoeken: Delawer Tamo onderzoekt samenwerkingsvormen, Pieter Oskam pleit voor een digitaal winkeliersplatform. Ze horen graag wat u vindt!

ONDERZOEK #1: SAMENWERKINGSVORMEN


VERTROUWEN

Tamo is op dit moment aan het onderzoeken in welke vorm zo’n samenwerking het beste gegoten zou kunnen worden. “Er zijn natuurlijk al diverse verbanden die zich voor zoets lenen – neem bijvoorbeeld SCMD, Netwerk Binnenstad of het nieuwe BOB. Waar ik benieuwd naar ben, is of er in de binnenstad het vertrouwen bestaat dat één van de bestaande organisaties zo’n samenbrengende rol kan hebben of dat er behoefte is aan een heel andere vorm van publiek-private samenwerking.”

ONDERZOEK #2: DIGITAAL PLATFORM

Ook het onderzoek van Pieter Oskam (25), TU-student Technische bestuurskunde en informatica, gaat over meer samenwerking, maar hij koos een andere insteek. Hij onderzoekt of er bij de Delftse winkeliers draagvlak bestaat voor een digitaal verkoop platform. “Mijn vertrekpunt is dat de winkeliers in binnensteden enorme kansen hebben, ook op het digitale vlak. Dat heeft, denk ik, alles te maken met de zogeheten zoekkosten: de tijd en geld die je met het zoeken naar producten kwijt bent. Wanneer je een cadeau voor je moeder zoekt, kun je naar de stad gaan en langs 3 winkels lopen.
Maar je kunt ook achter je pc gaan zitten en in een paar minuten 10 winkels bekijken – of 100 – met prijsvergelijking en al.”

**STADSWINKEL**


**LUIE STOEL**

Maar hoe zit het dan met de zogeheten winkelbeleving? Oskam: “Natuurlijk zijn er mensen die het leuk vinden om uren met een boodschappentas in de stad te slenteren. Mijn voorstel voor een stadswinkel is bedoeld om als winkelier ook de online-consumenten binnen te halen: de mensen die 24/7 willen winkelen vanuit hun luie stoel. Die kunnen in een digitaal platform op hun eigen manier op individueel productniveau zien wat Delft te bieden heeft en dan daarna gericht naar jouw winkel komen. En hetzelfde geldt ook voor nieuwe Delftenaren die het winkelaanbod nog niet kennen: mensen die anders automatisch naar V&D en de Hema zouden gaan en nu de zelfstandige winkels ontdekken.”

Hoe kan volgens u de binnenstad meer een geheel worden? Als u wilt meewerken aan de enquête van Delawer Tamo: klik [hier](#).

En wat vindt u van een digitaal winkeliersplatform? Wilt u meewerken aan het onderzoek van Pieter Oskam, klik [hier](#). Over de uitkomsten van beide onderzoeken leest u meer in een latere editie van de nieuwsbrief Binnenstad.

**INTERVIEW GIVEN AT ENTREPRENEURIAL EVENT**
Appendix G: SURVEY RETAILERS

Platform winkeliers Delft


Winkeliers uit stadscenra hebben enorme kansen, maar zien ook barrières. Vanuit het consumentenperspectief zijn de zoekkosten van producten bij offline winkels te hoog en denken ze dat online koppen goedkoper is. Aan de andere kant zijn de transactiekosten, transportkosten, wachtkosten en risicokosten bij online ondernemingen veel hoger. Grote kansen dus voor lokale winkeliers! Om hierop in te spelen zou je een eigen webshop kunnen beginnen. Aan de andere kant kost het winkeliers heel veel moeite, tijd, geld  en expertise om een webshop te starten. Dat is nou precies het doel van het platform, zoekkosten verlagen op zo een marier dat winkeliers hier nagenoeg geen moeite voor hoeven te doen.

Het platform is aan de ene kant een weergave van wat de stad te bieden heeft en aan de andere kant een verzamel webshop waarin alle winkeliers en overige ondernemingen gezamenlijk hun aanbod kunnen tonen. Door samen te werken kunnen kosten en tijd van winkeliers verminderd worden en de omzet vergroot.

Al vanaf mijn 15e levensjaar ben ik ontwikkelaar en heb daarmee alle capaciteiten om het te ontwikkelen.

Allereerst een paar basisgegevens voordat we beginnen met de vragen.

Naam

Winkelnaam

Adres

Email

Doorgaan »

16% voltooid
Algemene winkelinformatie

Hoeveel producten heeft u in uw assortiment

In welke product categorieen bent u actief?
- Boeken
- Muziek, Films & Games
- Speelgoed
- Baby
- persoonlijke verzorging
- Elektronica / witgoed
- Huishouden / keuken
- Baby
- Sierraden
- Sport artikelen
- Vakantie / Outdoor
- Wonen
- Tuin / Klussen
- Kleding / Mode
- Eten & Drinken
- Anders:

Welke prijs hebben uw producten hoofdzakelijk?
- 0-5 euro
- 5-20 euro
- 20-50 euro
- 50-100
- 100-200
- 200-500

Is dit dan het:
- Lage segment
- midden segment
- hoge segment

Wat heeft u gedigitaliseerd/voorhanden over uw producten
- Barcode (EAN)
- productnaam
- product omschrijving
- prijs
Hoeveel klanten heeft u gemiddeld per maand?

Hoeveel producten kopen uw klanten gemiddeld?

Vorige Doorgaan 33% voltooid
### Digitale activiteit

**Hoe vaardig bent u met computers/internet**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Helomaal niet** □ □ □ □ □ **Super vaardig** □ □ □ □ □

#### Digitale platform *

<table>
<thead>
<tr>
<th></th>
<th>niet aanwezig</th>
<th>beperkt aanwezig</th>
<th>Zeer uitgebreid</th>
<th>Utgebred en hoge activiteit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Twitter</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Website</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>marktplaats</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Eigen webshop</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Gedeelde webshop</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Overige platforms?</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

**Heeft u serieus overwogen een webshop te beginnen?**

- Ja □
- Nee □

**Wat zijn voor u de meest meespelende aspecten om wel of niet een webshop te beginnen **

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**1 Niet belangrijk** □ □ □ □ □ **5 Zeer belangrijk** □ □ □ □ □

- Geld □ □ □ □ □
- Kenis □ □ □ □ □
- Tijd □ □ □ □ □
- Verwachte inkomenst □ □ □ □ □
- Assortiment niet geschikt voor webshop □ □ □ □ □
- Gedoe extra afzetkanaal □ □ □ □ □
In welke mate denkt u dat een webshop / digitale aanwezig van uw winkel kan bijdragen aan de onderneming?

- Niet
- Beperkt
- Gedeeltelijk
- In grote mate

Overige opmerkingen


In welke mate wilt u zich als individuele ondernemer kunnen onderscheiden?

Niet onderscheiden zou inhouden dat je alleende winkelnaam/locatie ziet. Geheel onderscheiden zou zijn wanneer iedere ondernemer een geheel eigen gedeelte heeft, met eigen stijling op het platform. Ultraraad betekenen meer onderscheidend vermogen ook meer input vanuit de ondernemer.

- Nagenoeg niet onderscheiden
- Beperkte mate van onderscheiden. Bij doorklikken bijvoorbeeld
- Sterk onderscheiden
- Geheel onderscheiden, praktisch eigen website
- Anders:

Vorige Doorgaan 50% voltooid
Platform eigenschappen
Het platform kan op diverse manieren ingericht en daarmee verschillende functies vervullen. Op deze pagina wil ik graag te weten welke functies van belang zijn.

Welke functies wilt u gebruiken op een winkelplatform?
- Tonen winkelinformatie (adres, openingstijden etc)
- Aanbiedingen
- Beperkte product catalogus
- Uitgebreide product catalogus
- Betalen via platform & afhalen in winkel
- Lokale bezorging (a la thuisbezorgd.nl)
- Verzending (PostNL)
- Samenwerking met horoca (Koffie bij aankoop)
- Samenwerking met evenementen (Tijdens evenementen, extra acties)
- Samenwerking met overige winkeliers

Hoe ziet u een combinatie met de horoca voor u?
- Korting bij horoca bij aankoop product
- Spaarwaar Delft
- Verkoop van overige producten in uw winkel

Evenementen/musea
- Tijdens evenementen extra acties
- Korting op evenement/museum toegang
- Anders: 

Uw suggesties over hoe samen te werken met de horoca?

Toevoeging stadsbeleving
Binnen het platform wil ik kijken in hoeverre een stukje stadsbeleving opgenomen kan worden. Dat kan via de horoca of evenementen, hoeft u nog andere suggesties?
Below the transformed dataset of the retailer survey is shown

<table>
<thead>
<tr>
<th>category</th>
<th>vraag</th>
<th>mean</th>
<th>stdev</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>digitized products</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barcode (EAN)</td>
<td></td>
<td>0.09</td>
<td>0.30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>product name</td>
<td></td>
<td>0.73</td>
<td>0.47</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>product description</td>
<td></td>
<td>0.09</td>
<td>0.30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>price</td>
<td></td>
<td>0.64</td>
<td>0.50</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>image (s)</td>
<td></td>
<td>0.09</td>
<td>0.30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>product specifications</td>
<td></td>
<td>0.18</td>
<td>0.40</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>stock</td>
<td></td>
<td>0.09</td>
<td>0.30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>brand</td>
<td></td>
<td>0.55</td>
<td>0.52</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>type</td>
<td></td>
<td>0.09</td>
<td>0.30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>supplier</td>
<td></td>
<td>0.55</td>
<td>0.52</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>skill digital</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 to 5</td>
<td></td>
<td>3.12</td>
<td>1.00</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>digital presence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facebook</td>
<td></td>
<td>0.64</td>
<td>0.50</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Twitter</td>
<td></td>
<td>0.09</td>
<td>0.30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>website</td>
<td></td>
<td>1.00</td>
<td>0.00</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>marketplace</td>
<td></td>
<td>0.09</td>
<td>0.30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>web shop</td>
<td></td>
<td>0.09</td>
<td>0.30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>shared shop</td>
<td></td>
<td>0.00</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other platforms?</td>
<td></td>
<td>0.00</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>web shop considered</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 or 0</td>
<td></td>
<td>0.55</td>
<td>0.52</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td><strong>Web shop barriers (1-5)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>money</td>
<td></td>
<td>3.12</td>
<td>0.97</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>knowledge</td>
<td></td>
<td>4.04</td>
<td>0.85</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>time</td>
<td></td>
<td>4.04</td>
<td>0.85</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>expected revenue</td>
<td></td>
<td>4.68</td>
<td>0.54</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Range not suitable for shop</td>
<td></td>
<td>4.68</td>
<td>0.54</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Hassle additional sales channel</td>
<td></td>
<td>4.68</td>
<td>0.54</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>contribution shop</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 to 4</td>
<td></td>
<td>3.09</td>
<td>0.94</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>distinguish</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 to 4</td>
<td></td>
<td>2.91</td>
<td>0.30</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>functioned</td>
<td>Show store information (address, hours, etc.)</td>
<td>0.82</td>
<td>0.40</td>
<td>0.1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Offers</td>
<td>0.73</td>
<td>0.47</td>
<td>0.1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Limited product catalog</td>
<td>0.73</td>
<td>0.47</td>
<td>0.1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Detailed product catalog</td>
<td>0.55</td>
<td>0.52</td>
<td>0.1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Payment through platform and pick up in store</td>
<td>0.73</td>
<td>0.47</td>
<td>0.1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>local delivery (a là thuisbezorgd.nl)</td>
<td>0.73</td>
<td>0.47</td>
<td>0.1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Shipping (TNT)</td>
<td>0.18</td>
<td>0.40</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cooperation with catering (Coffee with purchase)</td>
<td>0.45</td>
<td>0.52</td>
<td>0.1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Cooperation with events (During concerts, additional actions)</td>
<td>0.55</td>
<td>0.52</td>
<td>0.1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Cooperation with other retailers</td>
<td>0.82</td>
<td>0.40</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>combination hospitality</td>
<td>discounts at restaurants when you purchase product</td>
<td>3.12</td>
<td>0.97</td>
<td>3.5</td>
<td>2</td>
<td>3.4</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>loyalty program</td>
<td>3.12</td>
<td>0.97</td>
<td>3.5</td>
<td>2</td>
<td>3.4</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sales or additional goods</td>
<td>1.44</td>
<td>0.59</td>
<td>1</td>
<td>3.1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>events</td>
<td>Offers with events</td>
<td>4.04</td>
<td>0.85</td>
<td>4.5</td>
<td>5</td>
<td>4.5</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tickets</td>
<td>2.19</td>
<td>0.84</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>different</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hours needed for platform</td>
<td>hours needed platform for a week</td>
<td>3.73</td>
<td>1.68</td>
<td>2.5</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>pricing schedule</td>
<td>commission per product sold</td>
<td>0.55</td>
<td>0.52</td>
<td>0.1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>fixed fee</td>
<td>0.27</td>
<td>0.47</td>
<td>0.1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>investment, and variable costs</td>
<td>0.45</td>
<td>0.52</td>
<td>0.1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>pay per click / view</td>
<td>0.73</td>
<td>0.47</td>
<td>0.1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>different</td>
<td>0.00</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>reasonable prices</td>
<td>commission rate</td>
<td>6.45</td>
<td>1.13</td>
<td>5.8</td>
<td>7.8</td>
<td>5.7</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>7</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fixed fee per month</td>
<td>25.71</td>
<td>7.32</td>
<td>30</td>
<td>25</td>
<td>30</td>
<td>30</td>
<td>25</td>
<td>30</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>single investment</td>
<td>866.67</td>
<td>416.33</td>
<td>##</td>
<td>##</td>
<td>##</td>
<td>##</td>
<td>##</td>
<td>##</td>
<td>##</td>
<td>##</td>
<td>##</td>
<td>##</td>
<td>##</td>
<td></td>
</tr>
<tr>
<td>lower prices online?</td>
<td>0.09</td>
<td>0.30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Consumer needs</td>
<td>Combined with hospitality</td>
<td>2.88</td>
<td>1.29</td>
<td>3.5</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Combination of events</td>
<td>2.88</td>
<td>1.29</td>
<td>3.5</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital poking around in the city (surfing)</td>
<td>3.77</td>
<td>1.27</td>
<td>4.5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soon be able to purchase a product</td>
<td>2.19</td>
<td>0.84</td>
<td>2.4</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Easily compare products</td>
<td>3.16</td>
<td>1.16</td>
<td>3.5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>potential Consumers</td>
<td>Young Delft</td>
<td>3.35</td>
<td>1.21</td>
<td>3.5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Oude Delft</td>
<td>3.06</td>
<td>1.34</td>
<td>3.5</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>men</td>
<td>3.51</td>
<td>0.87</td>
<td>3.5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>women</td>
<td>3.89</td>
<td>0.80</td>
<td>4.5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>day trippers</td>
<td>3.36</td>
<td>1.30</td>
<td>3.5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tourists</td>
<td>3.01</td>
<td>1.17</td>
<td>3.5</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumers expected value</td>
<td>Basic store information</td>
<td>3.21</td>
<td>1.30</td>
<td>3.5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>offers</td>
<td>3.35</td>
<td>1.26</td>
<td>3.5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>product information</td>
<td>2.95</td>
<td>1.04</td>
<td>3.5</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>---</td>
<td>---</td>
<td>-----</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>compare product</td>
<td>3.16</td>
<td>1.16</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payment via platform</td>
<td>2.46</td>
<td>1.08</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home delivery (1.50 euros)</td>
<td>2.70</td>
<td>1.26</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discounts at restaurants</td>
<td>2.04</td>
<td>0.88</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discount at events / museum</td>
<td>2.04</td>
<td>0.88</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Savings Model (loyalty cards)</td>
<td>1.96</td>
<td>0.70</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>targeted offers</td>
<td>3.50</td>
<td>1.20</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix H: SURVEY CONSUMERS

Voor mijn afstuderen ontwikkel ik een zoekmachine voor producten van de stad. Het idee is dat je 24/7 via het internet kan zien wat de winkels in de stad te bieden heeft. Je kan het zien als een webshop voor de stad. Veel onderzoek is er niet gedaan naar de behoefte aan zo een zoekmachine. Middels deze enquête wil ik deze behoefte onderzoeken.

Voradius

![Voradius logo](image)

Wat is Voradius? Zoek producten bij winkels in de buurt

![Voradius interface](image)

Geef aan of u het met de volgende stellingen eens bent

<table>
<thead>
<tr>
<th></th>
<th>geheel oneens</th>
<th>neutraal</th>
<th>geheel eens</th>
</tr>
</thead>
<tbody>
<tr>
<td>kleine winkels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>opzoeken lijkt mij</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>handig</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grote winkels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>opzoeken lijkt mij</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>handig</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>openingstijden zien</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lijkt mij handig</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ik wil productnamen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>zien</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ik wil productafbeeldingen zien</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deze dienst is een toegavnge waarde</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Overige opmerkingen?
Het nieuwe winkelen

Geef aan of u de volgende diensten waardeert?

<table>
<thead>
<tr>
<th>Dienst</th>
<th>niet handig</th>
<th>kan handig zijn</th>
<th>heel nuttig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thuis oriënteren</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persoonlijke aanbiedingen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Producten reserveren lijkt mij handig</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aankopen delen lijkt mij handig</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Punten sparen met stadsaankopen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spullen afhalen in parkeergarage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spullen thuis laten bezorgen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deze dienst is van toegevoegde waarde</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hoeveel euro zou u maximaal over hebben voor thuisbezorging?

- 0 euro
- 1 euro
- 2 euro
- 3 euro
- 4 euro
- 5 euro

Webshop Oss

Geef aan of u de volgende diensten waardeert?

<table>
<thead>
<tr>
<th></th>
<th>niet handig</th>
<th>kan handig zijn</th>
<th>heel nuttig</th>
</tr>
</thead>
<tbody>
<tr>
<td>producten bekijken</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>producten bestellen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>producten ophalen</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Overige opmerkingen
Uw gegevens
Deze gegevens gebruik ik om te zien hoe representatief de respondenten zijn

Naam

Leeftijd

- Man
- Vrouw

Geef aan hoe eens u het bent met de volgende stellingen *

<table>
<thead>
<tr>
<th></th>
<th>Geheel oneens</th>
<th>gedeeltelijk oneens</th>
<th>neutraal</th>
<th>eens</th>
<th>geheel mee eens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ik koop de meeste producten online (behalve supermarkt)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ik oriënteer me vaak online en koop een product offline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ik oriënteer me vaak offline en koop een product online</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Producten die ik online bestel hebben een prijs van:
- 0-10 euro
- 10-20 euro
- 20-50 euro
- 50-100 euro
- 100-200 euro
- 200-500 euro
- 500-100 euro

Bij welke productgroepen heeft online oriënteren voor u de grootste toegevoegde waarde?
- Winkels in persoonlijke verzorging
- Woon- en woningrichtingszaken
- Huishoudelijke-artikelenzaken
- Winkels in consumentenelectronica
- Doo-het-zelfzaken
### Results

<table>
<thead>
<tr>
<th>question</th>
<th>#1</th>
<th>#2</th>
<th>#3</th>
<th>#4</th>
<th>#5</th>
<th>AVG</th>
<th>st.dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>I buy most products online (except supermarkets)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,96</td>
<td>0,67</td>
</tr>
<tr>
<td>I orient myself often buy a product online and offline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3,91</td>
<td>0,97</td>
</tr>
<tr>
<td>I orienteer I often buy a product online and offline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,49</td>
<td>0,88</td>
</tr>
<tr>
<td>Small shops handy lookup small shops handy lookup</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4,66</td>
<td>0,52</td>
</tr>
<tr>
<td>Large stores look seems useful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,71</td>
<td>0,62</td>
</tr>
<tr>
<td>Opening show seems useful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,27</td>
<td>0,80</td>
</tr>
<tr>
<td>I orienteer I often buy a product online and offline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,85</td>
<td>0,50</td>
</tr>
<tr>
<td>I want to see product names</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4,43</td>
<td>0,63</td>
</tr>
<tr>
<td>I want to see product images</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4,25</td>
<td>0,70</td>
</tr>
<tr>
<td>Home orient</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,49</td>
<td>0,79</td>
</tr>
<tr>
<td>Personal offers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,40</td>
<td>0,71</td>
</tr>
<tr>
<td>Products reserve seems useful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,15</td>
<td>0,74</td>
</tr>
<tr>
<td>Products reserve seems useful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,86</td>
<td>1,05</td>
</tr>
<tr>
<td>Personal offer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,69</td>
<td>0,71</td>
</tr>
<tr>
<td>Personal offer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4,29</td>
<td>1,05</td>
</tr>
<tr>
<td>Purchases share seems useful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3,09</td>
<td>1,05</td>
</tr>
<tr>
<td>Save points with city purchase</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3,92</td>
<td>0,88</td>
</tr>
<tr>
<td>This service is a value added</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3,64</td>
<td>0,68</td>
</tr>
<tr>
<td>Things pick up in parking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,43</td>
<td>0,74</td>
</tr>
<tr>
<td>This service is of value added</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3,85</td>
<td>0,79</td>
</tr>
<tr>
<td>Stuff delivered at home</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4,23</td>
<td>0,74</td>
</tr>
<tr>
<td>How much would you have up on for home delivery?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4,08</td>
<td>0,88</td>
</tr>
<tr>
<td>view products</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4,05</td>
<td>0,75</td>
</tr>
<tr>
<td>order products</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,15</td>
<td>0,79</td>
</tr>
<tr>
<td>Get products</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,86</td>
<td>0,71</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#</th>
<th>AVG</th>
<th>st.dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 M</td>
<td>2,4</td>
<td>3,8</td>
</tr>
<tr>
<td>28 M</td>
<td>4,6</td>
<td>4,0</td>
</tr>
<tr>
<td>58 V</td>
<td>5,2</td>
<td>4,8</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>V</td>
<td>M</td>
</tr>
<tr>
<td>39</td>
<td>V</td>
<td>M</td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

*Note: The table above contains 16 columns and 16 rows.*
<p>| | | | | | | | | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>M</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>51</td>
<td>M</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>27</td>
<td>M</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>33</td>
<td>M</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>44</td>
<td>M</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>25</td>
<td>M</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>55</td>
<td>V</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>57</td>
<td>V</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>58</td>
<td>V</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>34</td>
<td>M</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>50</td>
<td>M</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>24</td>
<td>M</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>55</td>
<td>V</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>47</td>
<td>M</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>42</td>
<td>M</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>71</td>
<td>V</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>55</td>
<td>V</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>35</td>
<td>M</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>55</td>
<td>V</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>V</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>72</td>
<td>V</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>25</td>
<td>M</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>28</td>
<td>V</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>54</td>
<td>V</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>27</td>
<td>V</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>58</td>
<td>M</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>45</td>
<td>V</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>53</td>
<td>M</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>52</td>
<td>M</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>25</td>
<td>V</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>47</td>
<td>M</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>M</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>59</td>
<td>V</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>59</td>
<td>M</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>37</td>
<td>V</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>39</td>
<td>V</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>M</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>71</td>
<td>M</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>72</td>
<td>M</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>25</td>
<td>V</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>40</td>
<td>M</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>37</td>
<td>M</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>55</td>
<td>M</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>53</td>
<td>V</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>37</td>
<td>M</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27</td>
<td>M</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>
## Appendix I: PRODUCT INDEXING SAMPLE

<table>
<thead>
<tr>
<th>ean</th>
<th>shop</th>
<th>name</th>
<th>price</th>
</tr>
</thead>
<tbody>
<tr>
<td>8411782446795</td>
<td>Blokker</td>
<td>Stoffer en blik Vigar</td>
<td>5.99</td>
</tr>
<tr>
<td>400633034381</td>
<td>Blokker</td>
<td>city express bus speelgoed 40 centimeter</td>
<td>14.99</td>
</tr>
<tr>
<td>4006501725912</td>
<td>Blokker</td>
<td>leifheit compact strijktafel</td>
<td>49.99</td>
</tr>
<tr>
<td>4006501830401</td>
<td>Blokker</td>
<td>rolfix roldrooglijn leifheit</td>
<td>24.99</td>
</tr>
<tr>
<td>5000204539349</td>
<td>Blokker</td>
<td>brise zen relaxing aerosol glade</td>
<td>1.00</td>
</tr>
<tr>
<td>5010994738341</td>
<td>Blokker</td>
<td>heartbreaker bow rebelle</td>
<td>29.95</td>
</tr>
<tr>
<td>7350034651161</td>
<td>Blokker</td>
<td>sauber stofzuigers</td>
<td>39.95</td>
</tr>
<tr>
<td>746775263980</td>
<td>Blokker</td>
<td>sauber stofzuigers princess anna frozen disney</td>
<td>17.99</td>
</tr>
<tr>
<td>7610859112699</td>
<td>Blokker</td>
<td>rotho opbergen</td>
<td>5.49</td>
</tr>
<tr>
<td>8710103587583</td>
<td>Blokker</td>
<td>rotho opbergen</td>
<td>89.95</td>
</tr>
<tr>
<td>8710125071022</td>
<td>Blokker</td>
<td>zeg geen ja, nee king</td>
<td>14.99</td>
</tr>
<tr>
<td>8710141130253</td>
<td>Blokker</td>
<td>bruynzeel viltstiftten twinpoints</td>
<td>8.99</td>
</tr>
<tr>
<td>8710755389146</td>
<td>Blokker</td>
<td>brabantia pedaalemmer kunststof 5 liter,</td>
<td>31.00</td>
</tr>
<tr>
<td>8710964450248</td>
<td>Blokker</td>
<td>witte wijnglazen leerdam royal</td>
<td>6.99</td>
</tr>
<tr>
<td>871215805895</td>
<td>Blokker</td>
<td>digitale wekker xiron</td>
<td>7.99</td>
</tr>
<tr>
<td>871215842562</td>
<td>Blokker</td>
<td>sola mes</td>
<td>3.49</td>
</tr>
<tr>
<td>871215895049</td>
<td>Blokker</td>
<td>grofvuilzakken handy 120 liter</td>
<td>2.99</td>
</tr>
<tr>
<td>871215967029</td>
<td>Blokker</td>
<td></td>
<td>2.99</td>
</tr>
<tr>
<td>8712715967982</td>
<td>Blokker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8712715975369</td>
<td>Blokker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8713291003002</td>
<td>Blokker</td>
<td>pluche knuffel 18 cm woezel</td>
<td>5.99</td>
</tr>
<tr>
<td>8716201311631</td>
<td>Blokker</td>
<td>theepot clarity</td>
<td>34.95</td>
</tr>
<tr>
<td>8716201628494</td>
<td>Blokker</td>
<td>kerstballen goud/zilver 12 stuks</td>
<td>0.00</td>
</tr>
<tr>
<td>8716201679120</td>
<td>Blokker</td>
<td>telescoscische wandelstok handy vitality</td>
<td>9.99</td>
</tr>
<tr>
<td>8716201719574</td>
<td>Blokker</td>
<td></td>
<td>3.99</td>
</tr>
<tr>
<td>8716201727135</td>
<td>Blokker</td>
<td>kerstbal met glazen kerstballen</td>
<td>0.00</td>
</tr>
<tr>
<td>8716201733488</td>
<td>Blokker</td>
<td>quilt couvre-lit</td>
<td>0.00</td>
</tr>
<tr>
<td>8716201733495</td>
<td>Blokker</td>
<td>Quilt wit</td>
<td>39.55</td>
</tr>
<tr>
<td>8716201748321</td>
<td>Blokker</td>
<td></td>
<td>0.00</td>
</tr>
<tr>
<td>8716201770957</td>
<td>Blokker</td>
<td></td>
<td>9.99</td>
</tr>
<tr>
<td>8716201787061</td>
<td>Blokker</td>
<td></td>
<td>1.99</td>
</tr>
<tr>
<td>8716201787412</td>
<td>Blokker</td>
<td>fleece plaid</td>
<td>4.99</td>
</tr>
<tr>
<td>8716382154737</td>
<td>Blokker</td>
<td>onderbedbox 30 liter</td>
<td>7.99</td>
</tr>
<tr>
<td>8718801980743</td>
<td>Blokker</td>
<td>herman den blijker inmaakpot</td>
<td>4.99</td>
</tr>
<tr>
<td>8718827009572</td>
<td>Blokker</td>
<td>24kitchen fondueset met 4 vorkjes</td>
<td>14.99</td>
</tr>
<tr>
<td>24147243038</td>
<td>hetPauwtje</td>
<td>le creuset plancha grill</td>
<td>0.69</td>
</tr>
<tr>
<td>3338090572075</td>
<td>hetPauwtje</td>
<td></td>
<td>12.90</td>
</tr>
<tr>
<td>4006950023348</td>
<td>hetPauwtje</td>
<td>zoutmolen paris peugeot naturel 27 cm</td>
<td>0.49</td>
</tr>
<tr>
<td>EAN</td>
<td>Brand</td>
<td>Product Description</td>
<td>Price</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
<td>------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>4024433278917</td>
<td>HetPauwtje</td>
<td>Placemat geweven asa white 33 x 46</td>
<td>0.00</td>
</tr>
<tr>
<td>4260023019885</td>
<td>HetPauwtje</td>
<td>Houtskool beuken lotusgrill 1 kg</td>
<td>0.00</td>
</tr>
<tr>
<td>5706631049702</td>
<td>HetPauwtje</td>
<td>Vergiet zwart eva solo</td>
<td>19.95</td>
</tr>
<tr>
<td>5709846013452</td>
<td>HetPauwtje</td>
<td>Kaas bewaardoos stelton 14 cm</td>
<td>39.95</td>
</tr>
<tr>
<td>6411250528888</td>
<td>HetPauwtje</td>
<td>Beker groen marimekko oiva/unikko</td>
<td>0.00</td>
</tr>
<tr>
<td>6411800072489</td>
<td>HetPauwtje</td>
<td>Bord/schotel plat 15 cm</td>
<td>0.00</td>
</tr>
<tr>
<td>7611160043757</td>
<td>HetPauwtje</td>
<td>Victorinox schil mes</td>
<td>5.60</td>
</tr>
<tr>
<td>8029248267015</td>
<td>HetPauwtje</td>
<td>Spatel siliconen 32 cm appelgroen</td>
<td>7.95</td>
</tr>
<tr>
<td>8713077209017</td>
<td>HetPauwtje</td>
<td>Servetten beker royal vkb</td>
<td>12.95</td>
</tr>
<tr>
<td>8717703883824</td>
<td>HetPauwtje</td>
<td>Senz stormparaplu automatic</td>
<td>49.95</td>
</tr>
<tr>
<td>8717931504423</td>
<td>HetPauwtje</td>
<td>Delft blue egg set</td>
<td>0.00</td>
</tr>
<tr>
<td>8717953047205</td>
<td>HetPauwtje</td>
<td>Dopper blauw</td>
<td>0.00</td>
</tr>
<tr>
<td>3590931278</td>
<td>Lewestein</td>
<td>DMC Six Strand Embroidery Cotton</td>
<td>0.00</td>
</tr>
<tr>
<td>77540810703</td>
<td>Lewestein</td>
<td>Satinband 40mm 25m</td>
<td>0.00</td>
</tr>
<tr>
<td>4006437065045</td>
<td>Lewestein</td>
<td>Garen zwart 200m</td>
<td>0.00</td>
</tr>
<tr>
<td>4008003960822</td>
<td>Lewestein</td>
<td>Wol 100m</td>
<td>0.00</td>
</tr>
<tr>
<td>4008015026127</td>
<td>Lewestein</td>
<td>Pronto BH - sluiting</td>
<td>0.00</td>
</tr>
<tr>
<td>8697674224263</td>
<td>Lewestein</td>
<td>Scheepjeswol zwart</td>
<td>0.00</td>
</tr>
<tr>
<td>8712662007090</td>
<td>Lewestein</td>
<td>Sewing supplies organiser</td>
<td>0.00</td>
</tr>
<tr>
<td>5400107711666</td>
<td>Praxis</td>
<td>Lamp cars 17 x 30cm</td>
<td>3.69</td>
</tr>
<tr>
<td>5400107140272</td>
<td>Praxis</td>
<td>Gardena comfort</td>
<td>26.99</td>
</tr>
<tr>
<td>5400107431953</td>
<td>Praxis</td>
<td>Heggescgaar central park cpe 7161</td>
<td>7.99</td>
</tr>
<tr>
<td>5400107587166</td>
<td>Praxis</td>
<td>Schoepenrooster groen alu</td>
<td>13.99</td>
</tr>
<tr>
<td>5411960206764</td>
<td>Praxis</td>
<td>Onkruidbestrijden resolva</td>
<td>11.95</td>
</tr>
<tr>
<td>5415125153008</td>
<td>Praxis</td>
<td>Vloerdeel gloriosa parel eik</td>
<td>14.99</td>
</tr>
<tr>
<td>7610583095725</td>
<td>Praxis</td>
<td>Spirera tandenborstelbeker kiwi groen</td>
<td>3.49</td>
</tr>
<tr>
<td>8437003552861</td>
<td>Praxis</td>
<td>Vloertegel ardennes blackstone</td>
<td>34.49</td>
</tr>
<tr>
<td>8711253897546</td>
<td>Praxis</td>
<td>Kinderhelm space maat s</td>
<td>28.99</td>
</tr>
<tr>
<td>8711283404059</td>
<td>Praxis</td>
<td>Tochtband zelfklevend 6 meter</td>
<td>12.39</td>
</tr>
<tr>
<td>87111286611218</td>
<td>Praxis</td>
<td>Houtskool briketten 3kg</td>
<td>3.49</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Price</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------------------------------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>8711422075256</td>
<td>praxis afwateringsstrip douche</td>
<td>18.99</td>
<td></td>
</tr>
<tr>
<td>8711577020354</td>
<td>praxis ontkalker espresso reiniger hg</td>
<td>3.99</td>
<td></td>
</tr>
<tr>
<td>8711613847334</td>
<td>praxis tuinhekoverslag</td>
<td>8.69</td>
<td></td>
</tr>
<tr>
<td>8711658251608</td>
<td>praxis dimmerset ranex set om al uw lampen in huis te dimmen</td>
<td>39.99</td>
<td></td>
</tr>
<tr>
<td>8717853922138</td>
<td>praxis elektrische openhaard</td>
<td>1.89</td>
<td></td>
</tr>
<tr>
<td>8718291442271</td>
<td>praxis philips ecomoods wall light</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>
Appendix J: BPMN

The Business process modelling notation (BPMN) diagram is displayed on page 65. The notation used does not allow to define all functionalities. Some function are not embedded in the high level process visualizations, therefore, a quick overview of the important functionalities per actors are listed below

Retailers
- Register
- Update profile
  - name
  - Address
  - description
  - opening times
- Settings
  - Show price
  - Show stock
  - Enable customer chat
  - Enable stock requests
  - Enable price requests
  - Enable product reservations
  - Enable product purchases
  - Enable loyal-tee
  - Enable local-to-local delivery
  - Payment options
- manage promotions
- Manage products
  - Add
    - Barcode scan
    - Enter product code
    - Enter product name
    - Search image
    - Upload image
  - Remove
  - update
    - price
    - stock
    - image
    - description
- statistics
  - Views
  - Clicks
  - Buys
  - Consumer statistics
- Partners
  - Request partnership
  - Accept partnership

Platform owner
• Retailer management
  o Invite
  o Message
  o Alter settings
  o Alter product catalogue
• Add stores
• Add products
• Dashboard
  o Logbook
  o Retailer statistics
  o Customer statistics
• Financial
  o Revenue statistics
  o Pay retailers

Bars and restaurants
• Profile
• Manage advertisements
• Loyal-tee management
  o See coming coupons
  o Edit coupons
  o Enter used coupons

Consumer
• Search products
• Send stock request
• Save product
• Register
• Settings
  o General info
  o Loyal-tee points
  o Receive advertisements
• Buy products
  o Reservation
  o Purchase
    ▪ Pick up at store
    ▪ Pick up at central location
    ▪ Home delivery
• Store favourites
• Help improving platform and earn loyal-tee points or credit
  o Edit products
  o Send suggestions
  o Earn loyal-tee points