PROJECT PUBLIZEBRA.SE

Development of a user-centered special digital library service for self-publishing authors in Sweden

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Project Publizebra.se

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The goal of this thesis is the development of Publizebra.se, a user-centered special digital library prototype for self-publishing authors. The service is aimed to provide valuable information, features and resources in the production, marketing and distribution of books.

Digital libraries have in recent years started to play a role in providing self-published authors with the tools, information and services required to publish independently with standardized quality. The focus has been to promote self-publishing and avoiding the pitfalls of appalling cover art, poor editorial work or zero marketing. In Sweden no such digital library initiative exists, combined with the problem of relatively few self-publishing services providing the possibility of independent publishing, without stepping into any of the pitfalls above.

The development of Publizebra.se seeks to fill the gap of digital library initiatives for self-publishing in Sweden, aggregating and distributing the value-adding features and user needs of independent authors. The applied research follows a five-step design process associated with the methodology of user-centered design, consisting of strategy, discovery, information architecture, design and prototyping. Every step of the process encompassed methodologies for taking the development forward, while further relying on fundamental research of the environment and user needs. Heuristic evaluation and expert evaluation were conducted on the prototype by LIS and usability experts to assess its functionality and user-centered design. The feedback concluded the prototype to be accessible and easy to use, while indicating the need for additional development and improvements to visual and interaction design features prior to further testing.

special digital library, user-centered design, self-publishing, digital libraries, interaction design, prototyping, expert evaluation, heuristic evaluation
TABLE OF CONTENTS

TABLE OF CONTENTS ........................................................................................................... I
LIST OF TABLES .................................................................................................................. IV
LIST OF FIGURES ................................................................................................................ IV
1 INTRODUCTION .................................................................................................................. 1
    1.1 PROBLEM FORMULATION .......................................................................................... 3
    1.2 AIM OF STUDY AND OBJECTIVES ......................................................................... 6
    1.3 RESEARCH QUESTIONS ........................................................................................... 6
    1.4 LIMITATIONS .......................................................................................................... 7
    1.5 CLAIM FOR ORIGINALITY .................................................................................... 8
    1.6 DIGITAL LIBRARY OR DIGITAL SERVICE? .............................................................. 9
    1.7 OUTLINE OF THE THESIS .................................................................................... 10
2 METHODOLOGY ................................................................................................................ 11
    2.1 USER-CENTERED DESIGN METHODOLOGY ....................................................... 11
    2.2 HEURISTIC EVALUATION METHODOLOGY ....................................................... 13
    2.3 EXPERT EVALUATION METHODOLOGY ............................................................ 14
    2.4 THE IMPORTANCE OF STRATEGY ....................................................................... 16
3 THE DISCOVERY PHASE ..................................................................................................... 17
    3.1 ENVIRONMENTAL SCAN .......................................................................................... 17
    3.2 USER NEED ASSESSMENT ..................................................................................... 18
    3.3 STATED NEEDS, REAL NEEDS AND UNSTATED NEEDS ........................................ 18
    3.4 PROJECT OBJECTIVES .......................................................................................... 19
    3.5 REQUIREMENTS DOCUMENT ............................................................................... 20
4 INFORMATION ARCHITECTURE ....................................................................................... 21
    4.1 CONCEPTUAL MODEL METHODOLOGY ............................................................. 21
    4.2 USER PERSONA METHODOLOGY ......................................................................... 22
    4.3 WIREFRAME METHODOLOGY .............................................................................. 23
5 VISUAL DESIGN AND INTERACTION DESIGN PRINCIPLES ............................................. 24
    5.1 VISUAL DESIGN PRINCIPLES ............................................................................... 24
        5.1.1 USE OF AFFORDANCES ................................................................................. 24
        5.1.2 VISUAL HIERARCHY ..................................................................................... 24
        5.1.3 RECURRIENCE OF ELEMENTS FOR UNITY .................................................. 25
        5.1.4 UNDERSTANDABLE AND RECOGNIZABLE ICONS ..................................... 25
        5.1.5 READABILITY AND SIMPLICITY .................................................................. 26
        5.1.6 REASON FOR EVERY DECISION AND HAVE A PURPOSE FOR EVERY ELEMENT .......................................................... 26
        5.1.7 SEARCH FOR INSPIRATION IN DESIGN LANGUAGE .................................. 26
    5.2 INTERACTION DESIGN PRINCIPLES ........................................................................ 26
        5.2.1 MAKE USE OF CONVENTIONS ..................................................................... 27
        5.2.2 BREAK UP PAGES ......................................................................................... 27
        5.2.3 SUPPORT SCANNING OF CONTENT .............................................................. 27
        5.2.4 PERSISTENT NAVIGATION ........................................................................... 28
        5.2.5 DO NOT GET LOST IN SPACE ....................................................................... 28
        5.2.6 HOME PAGE PRINCIPLES ............................................................................. 28
    5.3 SO WHERE IS USER EXPERIENCE IN ALL OF THIS? ............................................... 29
6 PROTOTYPING METHODOLOGY ....................................................................................... 30
APPENDICES .................................................................................................................. 121

APPENDIX 1: HEURISTIC EVALUATION FORM AND RESULTS........................................... CXXIII

APPENDIX 2: EXPERT EVALUATION – TESTING OF USABILITY FORM ............................... CXXIV

APPENDIX 3: EXPERT EVALUATION – TESTING OF USABILITY RESULTS ....................... CXXX

APPENDIX 4: IMAGES USED WITHOUT LICENSING RESTRICTIONS ............................... CXXXVI

APPENDIX 5. GOOGLE TOP SEARCH RESULTS OF SELF-PUBLISHING TERMS ............... CXXXVII

APPENDIX 6. MEDIUM-FIDELITY WIREFRAMES ............................................................ CXLI

APPENDIX 7. VISUAL PROFILE ......................................................................................... CXLVI

LIST OF TABLES

Table 1. Requirements Document of Publizebra (MoSCoW Model) ........................................ 55
Table 2. The Library Acquisition Persona ............................................................................... 57
Table 3. The Standardized Quality Persona ........................................................................... 58
Table 4. The Marketing Skills Persona .................................................................................... 59

LIST OF FIGURES

Figure 1. User-centered Design Development Process .......................................................... 12
Figure 2. Network Conceptual Model of The Publizebra Prototype ....................................... 60
Figure E.1 Prototype Home Page .......................................................................................... 68
Figure E.2 Prototype Main Content Page ............................................................................... 69
Figure E.3 Prototype User Goal Page (Sub-page) ................................................................. 70
Figure E.4 Prototype Library Acquisition Page ..................................................................... 71
Figure E.5 Prototype Bok-till-bibliotek ................................................................................ 72
Figure E.6 Prototype Cover Art Collection ........................................................................... 73
1 INTRODUCTION

Digital publishing services and online marketplaces have staggeringly increased the possibility to publish and print books and e-books without a publishing house, as ISBN-branded books that were self-published increased globally by 437% between 2008 and 2014 (Murray & Squires, 2013; Palmer, 2014). The business of providing services that facilitate self-publishing is continually expanding, with new companies popping up in Europe and across the globe, including the attraction of well-renowned publishing houses to take a greater interest in starting, merging or acquiring self-publishing business models in their arsenal (Wischenbart et al., 2017; Matulionyte et al., 2017). The growth of independently published titles in Sweden is increasing and in 2016 over 13 percent of all books registered in the Royal Library National Bibliography were self-published (Nationalbibliografin, 2016). The idea of going solo and tackling the art of publishing an e-book or getting a book printed, distributed and read by the public may then seem like a sufficient decision from the perspective of an author, in a time where the production, marketing, accessibility and reading of books is becoming more digital and less restricted to high street bookshops. However, it may come with a time-consuming or costly price-tag as self-publishing has been shown to be increasingly difficult and put substantial weight in the hands of the author, in making decisions or being in charge of managerial tasks outside of their area of expertise; such as marketing, editorial work and production aspects (Bergström et al., 2017; Sandy, 2016; Gudinavičius, 2015).

An important aspect of self-publishing and central to the motivation of this thesis is the notion of responsibility and control placed upon the author, which according to Sandy (2016) is related to the very nature of self-publishing, as expertise and commitment will not be imposed by any external publisher.

While self-publishing has grown to find a range of possibilities through digital means of online publishing services and marketplaces to reach readers and produce books, its relation to public libraries have fallen behind. Outside of academia, libraries and digital libraries struggle to incorporate and recognize self-published books and e-books in their organization, partly due to the perception and quality of self-published books, and long-established distribution procedures of how works are purchased and collected (Sandy, 2016; Lindkvist, 2017). Yet there exists a notion within both LIS research and actively through projects and services across libraries, regions and organizations to address or establish a possible role for public libraries in supporting self-publishing through digital means (Sandy, 2016; Moulaison & Le Beau, 2015; LaRue, 2015a). The catalyst for public libraries to provide digital publishing services for independent authors may vary, however most initiatives and programs are conceived on the basis of local and public good (Sandy, 2016; LaRue, 2015a).
Servicing the public is perhaps the most rational and universal reasoning according to Donnelly (2010) in pointing to the cultural importance of passing stories from generation to generation, and the logical position of public libraries to collect and make these accessible, while being a makerspace for the stories to be created. Digital services and projects such as SELF-E, LAPL Writes and the eBook Self-Publishing Partnership initiated by library organizations in the US have shown a strong focus on empowering the author’s proficiency and understanding of the production of self-published books, to reach a level of quality standard and publicity to be incorporated into public library collections and retail markets (Sandy, 2016; Conrad, 2017). These libraries have identified the difficulty of independent publishing in terms of both production quality, distribution and marketing, and sought to strengthen the relation between public libraries as a makerspace and self-publishing by educating authors and adding self-published titles to their collections.

The intention with this thesis is to develop a special digital library prototype titled Publizebra.se, as an openly accessible information service with resources specifically for the benefit of Swedish self-publishing authors, which currently does not exist in Sweden. From a research perspective this thesis will be of relevance to illustrate the possibilities and wide spectrum of what digital libraries may carry out and how they can operate as information services on the web, especially in the context of special digital libraries designed with a defined purpose. Further the thesis is of interest to research by presenting the developing and prototyping process of a lightweight user-centered Swedish digital library from the very inception of problem identification to applied research in creating a digital service based on user needs and design principles. The prototype and thesis may in turn be of benefit for future research and development of user-centered digital library services designed towards specific groups or interests; in sharing possible difficulties, approaches, solutions and critical aspects to overcome during the entire development process.

From a wider perspective of connecting to society at large, the subject of this thesis is of relevance to the role of public libraries and their digital platforms in recognition and relation to self-published material and authors. From a democratic standpoint of accessibility and representation, public libraries may then have to reconsider their perception and collection-development of self-published books that are capable of going toe-to-toe with books distributed by publishing houses, an idea that has been stressed by Dawson (2008) since the rise of online self-publishing. While Publizebra is not tied to any particular public library, the service may provide Swedish libraries with a tool and understanding of self-publishing that can be applied within their organization and towards patrons.
The content and information provided on the Publizebra digital library platform will seek to answer to user needs and boost the potential of self-published authors through insight and resources in how to produce and distribute books and tend to their authorship role according to current standards and methods. In doing so, Publizebra wishes to narrow the gap between self-publishing and libraries by providing a unique digital library space, to reduce the neglect of self-published works that are created with a standardized and corresponding quality to books produced by publishing houses.

1.1 PROBLEM FORMULATION

Professionals within the industry of publishing along with public libraries have heavily underscored that to succeed as a self-publishing author, one has to perform splendidly in activities not associated with traditional authorship (Philips, 2014; Sandy, 2016). The idea of traditional publishing is most commonly associated with the classical role of author and publisher in a system reflecting the way that books have been made and sold throughout the last centuries (Wilson, 2015). In this system authors deliver their works to a publisher to pass a vetting stage, followed by a protocol of editorial procedures by publisher standards for the work to be eligible for printing, marketing and distribution (Carolan & Evain, 2013; Wilson, 2015). These steps and features of production together with the final materialized book from a renowned publishing house, is often associated with a validation of quality and added value by both readers and authors (Carolan & Evain, 2013; Thompson, 2012). If these value-adding features in the production, distribution and marketing of both book and author is of substantial importance to radiate quality and authenticity, self-published authors may not blindly ignore them without repercussion. There is a never-ending supply of criticism from activists, publishers and authors about the mediocrity of self-published books and e-books being deemed of poor quality due to lack of editorial control, effort, validity and vetting procedures (Thomlison & Bélanger, 2015; Carolan & Evain, 2013; Sandy, 2016).

The self-publishing author that seeks to be disassociated with the negative connotations above must then be aware of and understand the check-list of expectations, tasks and current industry standards of book publishing, which may go beyond eliminating a heap of spelling errors or using Comic Sans. The readiness of authors to hold up to expectations and recognize aspects of personal responsibility and proper execution in the production and marketing process of self-publishing has been found to be relatively low, as Baverstock and Steinitz (2013) in a UK survey of self-publishing authors found that only 10 per cent identified themselves as knowing a lot about self-publishing, while most rated themselves as mediocre.
The importance of a well-executed production and aiding self-published authors in doing so, is of further interest when considering the modern day market, where Philips (2014) argues that the filtering of content can now take place post publication, instead of prior by publishing houses, as today it is the buying readers that to a greater extent participate in the quality picking procedure.

The notion of quality to attract readers in this selection process when browsing Adlibris or Bokus is then central for the self-publisher to acknowledge, where quality according to Carolan and Evain (2013) lies in creating a book of industry standards with appealing visual quality and correct dimensions and format for e-book and print, as well as employing artistic finesse to both distribution and production.

For the field of self-publishing services to recognize the potential of adhering to established quality standards by actively offering and advocating for its client-base of authors to utilize and understand these standards and value-adding features in production, would then seemingly be of great benefit for the service provider; by publishing material that may hold an increased appeal for customers participating in the quality picking process. The lack of such quality standards and value adding features and factors has been shown to be a problem for authors in Sweden, as Bergström et al. (2017) points to the concerns expressed by authors due to the comparatively few Swedish services to select from that does provide enough opportunities for self-publishing with standardized quality. This lack of options is a serious issue beyond the possibility of becoming a best-selling detective novelist through self-publishing on the domestic market, as it further has social implications of inclusion and availability of self-published books in public libraries due to the collection-development procedure and discoverability of self-published works. DeWild and Jarema (2015) argues that the staff responsible for acquiring books in libraries rely on the vetting process and quality assurance of traditional publishing in their book selection decisions. Resulting in expectations of books to not only be found within the vendor lists and databases they explore, but hold a wide array of attributes to be added to the acquisition system, ranging from holding an ISBN, appealing design and cover art, editorial-worked and structured content as well as metadata (Ibid.) If self-publishing falters to provide such value-adding attributes, it may prove difficult for the independent author to be part of public library collections and have their works openly available for local communities.
Over the last decade, research in self-publishing has consistently pointed to the need for independent authors to go beyond the traditional role of authorship to prosper, by producing and undertaking value-adding features along with replicating industry standards conducted by publishing houses (Carolan & Evain, 2013). The user needs and features that are then regarded as important particularly for self-publishing have not been assessed, reviewed and presented in Swedish for the benefit of independent authors in an accessible, appealing and with a user-centered design approach.

An accessible service with a set purpose aimed at providing information, resources, links and data about self-publishing from contemporary research and opinions of knowledgeable authors for the interest of self-publishing, in the form of a specialised digital library does not exist in Sweden. One may argue that this lack of service is a disconcerting failure for the possibilities of what digital libraries and libraries as information services can provide in bridging the gap existing between self-published material and the understanding and collection of such works in Swedish libraries.

Perhaps it is then not shocking that turning to search browsers for information or resources on self-publishing in Swedish will not result in connecting to any digital library services. Search engine queries related to information about and the venture of self-publishing predominantly return advertisements and landing pages of commercial self-publishing services, that upon entering immediately offer their monetary services and packages (Appendix 5). These queries are naturally of importance for these businesses, where Moulaison and Le Beau (2015) points out that self-publishing services are most often for-profit and will charge fees to provide the quality associated with traditional publishing. However, here it is important to recall the findings of Bergström et al. (2017) in how Swedish self-publishing services that offer self-publishing with standardized quality and value added-features are relatively few. If there is an absence of non-commercial information services distributing resources and research findings that share important and value-adding features of benefit for the self-publishing author, independent authors may then risk having to solely rely on the soundness of commercial self-publishing and authoring services to provide standardized quality and value-adding features, along with fair costs, terms and conditions for both book and author (Matulionyte et al., 2017).
1.2 AIM OF STUDY AND OBJECTIVES

The goal of this thesis is to develop a special digital library prototype aimed at self-publishing authors, to provide information of how self-publishing authorship may require an undertaking beyond the writing of a book, and to seriously factor the possibility of further personal engagement or forwarding of tasks, procedures and factors that create additional value and reflect industry standards in production, distribution and marketing. In addition, the digital library will serve to provide complimentary resources and features identified as valuable and associated with the production of books to improve quality, such as cover art, templates and web applications. Resources are provided with the intention being for authors to see the relevance of value-adding features particularly for their book and authorship - and which of these aspects that may be achieved by the author independently or require outsourcing based on expertise, time-commitment and costs. Consequentially an additional objective is to map and establish the value-added features and factors particularly of importance for the self-published author and book based on the identified user needs.

The goals and objectives of the applied research process, in developing and delivering a digital library prototype is to produce an appealing, user-centered digital service according to user-centered design principles and research in special digital library development. Hence it is not only of importance to collect and analyze empirical data surrounding self-publishing, but to represent the findings and distribute resources in a functional and usable digital library.

1.3 RESEARCH QUESTIONS

1. What are the user needs and value-adding features for self-published books and authors identified by public libraries, authors and research?

2. How may value-adding features and user needs be aggregated in a special digital library service to distribute information, resources and guidance for the benefit of self-publishing authors?
1.4 LIMITATIONS

The limitations of the thesis consist of three different areas where distinct limitations have been made based on logical restraints of a master’s thesis, along with theoretical reasoning for limiting research, development and design. The first limitation is in regards to what the special digital library service will consider as user needs and value-adding features that are explicitly related to self-publishing, where the process of book writing is excluded. The thesis will thus not focus on issues such as writer’s block, inspiration and guidance of how to write which are aspects brought up and often provided by public libraries as found by Sandy (2016) and Donnelly (2010) among others. The stage of writing is highly individual and relatively blurry where it does not distinctively differentiate authors that publish independently or traditionally; as it is during post-writing procedures of editing, production, distribution and marketing that the two are drastically different (Philips, 2014; Carolan & Evain, 2013). Including writing would further risk opening a pandora’s box of various user needs and value-adding features of particular genres, authors and communities that would be far too wide to cover and research. Additionally, the focus on user needs and value-adding features of independent production, distribution and marketing of author and book largely excludes the business of academic publishing; as the academic realm has embraced library publishing and self-publishing to a greater extent in a different system and setting, including complex topics such as open access and bibliometrics (Sandy, 2016).

The second limitation relates to empirical assessment of user needs and value-adding features, where no interviews or focus groups with self-published authors are specifically conducted for the thesis. The rationale for excluding the task of interviewing authors in research of user needs and value-adding features is mainly due to project time limitations in selecting an adequate sample of self-publishing authors for analysis, and the risk of self-reporting error where respondents provide information based on their self-perception rather than actual behaviour or needs (Goodwin, 2009). To avoid issues of self-reporting error or interviewing a heterogeneous group of self-publishing authors that are not fully representative and could send the research and design off-track would require extensive screening, interviewing and explanation of the study (Ibid). Performing such an endeavor of interviews and research would be the subject of a thesis in itself, and it was therefore decided to use existing data of publications, case studies, interviews and surveys available. In the context of user-centered design, Still and Crane (2017) argues that the use of existing data of published research, user forums, statistics and user opinions is an effective strategy to avoid re-collecting data and being able to push deeper into research questions and methodologies through consulting available material that is relevant for the design process. Thus, the research on user needs and value-adding features in this thesis is attempting to include a wide range of sources and material where self-publishing authors are expressing opinions and being studied or discussed.
While Publizebra will focus on user needs and wants from an early stage of development, it does not have the capabilities of bringing on users in the form of exclusive focus groups, surveys and interviews of self-published authors explicitly for the prototype as suggested by Still (2016). The user-centered design methodology of Publizebra will rather focus on developing a prototype and from inception consider self-published authors based on empirical data on identified user needs and value-adding features. Consequentially the limitations imposed will center the development process to a relatively early stage of developing a special digital library. Emphasis is put on creating a rigorous prototype based on principles of usability, interaction design, visual design and functionality through evaluation; to ensure the design is functional and made for real world use (Still & Crane, 2017). However, the thesis is clearly recognizing that for the digital library service to proceed from a prototyping state, actual involvement of self-publishing authors for usability testing and feedback has to be included to further develop and create a refined user experience and service (Ibid.).

1.5 CLAIM FOR ORIGINALITY

A special digital library aimed at self-publishing authors does not exist in Swedish, research on the development or use of a self-publishing digital library in a context of Sweden is thus not available. The development of a Swedish digital library dedicated to self-publishing with a documented and stated user-centered design perspective from research to prototyping is an original combination and has not been executed previously. The context of public libraries and self-publishing has received little focus in research according to Sandy (2016), where this thesis will extend upon the relation between self-publishing and public libraries and the user needs associated with bridging the gap between the two.
1.6 DIGITAL LIBRARY OR DIGITAL SERVICE?

The DELOS Network of Excellence on Digital Libraries (Candela et al., 2007) characterize digital libraries as tools used in intellectual activity without any physical, temporal, personal, conceptual or logical barriers to information that facilitate collaboration and communication. In simple terms, Buchanan (2010) define digital libraries as collections of digital content and digital services providing information, tools, sharing and linking content along with interactive environments. In relation to the relatively broad definition of what may constitute a digital library stated above is the existence of special digital libraries, providing information and services related to a specified purpose or to a defined target audience according of users such as Europeana or Brill’s Digital Library of World War 1 (Dobreva et al., 2010; Semertzaki, 2011; Brill.com, 2018). The above notion of digital libraries incorporating digital services by Buchanan (2010) in conjunction with the more defined purpose of special digital libraries, is how Publizebra is perceived in this thesis. As such, the prototype is being developed from inception with the mindset of creating a digital library, which is strongly reflected in the strategy and goals of Publizebra. While the prototype follows almost universally applicable design principles and development stages for web applications, the findings and practices of researched digital libraries and special digital libraries in this thesis are significant for how user-centered design, accessibility and sustainability are approached and motivated.
1.7 OUTLINE OF THE THESIS

Conducting applied research and covering the development process of a special digital library, from inception of strategy to prototyping, while placing it in a research context of library and information science along with user-centered design results in a relatively unconventional thesis structure. In order to grasp the scope and structure of the thesis it is of significance to understand how the content is organized in different major stages of research and development. The thesis is split in three distinctive passages following the current introduction chapter and is outlined below.

ESTABLISHING METHODOLOGIES AND PRINCIPLES (2-6)

The initial chapters of 2 to 6 establishes the main methodology of user-centered design, along with the additional principles and methods of each development stage; from strategy to prototyping and evaluation. Here it is important to recognize that the function of these chapters is not only to specify particular methods and principles. Effectively, this section presents a fundamental framework for developing the user-centered special digital library, while reasoning for why and how each stage of development for Publizebra should be conducted during applied research.

EXECUTION AND IMPLEMENTATION (A-G)

The alphabetical chapters A to G presents in constructive order the execution of each user-centered design development stage, including the implementation of methods and principles in prototyping. It is during these chapters that the lion share of both fundamental research and applied research of the thesis is conducted and presented, from an empirical environmental scan to practical heuristic and expert evaluation.

CLOSING DISCUSSION AND CONCLUSION (7-8)

Stepping back from conducting and presenting results of each stage of the development process, the final section reflects upon the thesis as a whole and how the study may contribute to the field of digital libraries. The discussion is focused on how each of the development procedures from discovery to implementation and evaluation contributed to the research questions, aim and problem formulation. Lastly, the thesis is concluded by formally answering the research along with suggestions for future research on self-publishing in digital libraries.
2 METHODOLOGY

The development of the Publizebra digital library is initiated from scratch with a user-centered design, meaning that an array of methodologies and processes are involved in various stages of development from research and review of literature, to practical interaction design and prototyping.

2.1 USER-CENTERED DESIGN METHODOLOGY

The cornerstone of this thesis is following a user-centered design approach of which Normore (2008) argues to involve user analysis in an early state of development, followed by usability studies and evaluation in the final stages. User-centered design methods are according to Dobrova et al. (2012) an important part of frontend development of digital libraries to improve services and create features that are of usability for intended users.

According to Kautonen and Nieminen (2018) knowledge of user-centered design in digital libraries is increasing, and for platforms on the web such as digital libraries, user-centered design seeks to provide what users want, can or need to use of the platform rather than enforcing a change in behaviour by users in order for a service to work (Bašić, 2018). The success of a service requires integration with the already existing mental models of users, or a relatively smooth adaptation for users based on previous knowledge and understanding (Lowdermilk, 2013; Still & Crane, 2017).

The main consideration for user-centered design lies in focusing on that the success, needs and goals of end users is of utmost priority, reflecting what is argued to be more of a philosophical way of thinking in the approach to design, rather than a strict methodology (Bašić, 2018; Norman, 2013). The duality of user-centered design as methodology and philosophy is stemming from the notion that techniques of a wide selection of disciplines are involved in order to understand users and improve experiences, ranging from user research, interaction design and cognitive science (Still & Crane, 2017). User-centered design is applied as both philosophy and methodology - as it will act as a philosophical framework for reasoning from purpose and strategy to analysis, while being practically implemented as principles in setting limitations, carrying out visual and interaction design, evaluation and prototyping; which Still and Crane (2017) regards as adhering to principles of a methodology. The employment of pre-defined principles during the design of a service will ensure that decisions and possible problems can be guided by set user-centered principles, which in turn can be used to evaluate the focus on users in the design decisions made (Ibid.).
While principles of user-centered design will play a key role during the development of Publizebra as well as in the research analysis of special digital libraries and library self-publishing services, the idea of following entrenched principles of user-centered design as if they were the ten commandments in the way that Still and Crane (2017) has interpreted user-centered design could in the case of Publizebra be disadvantageous.

The reason for taking on the principles as guidelines rather than strict rules in the development process is due to the applied research context of which Publizebra is created, where project limitations and strategic choices related to the thesis of project size, assets and time have to be recognized. The context has arguably an impact on to what extent user-centered design can be implemented in the prototype related to iterative involvement of users, as two of the key principles by Still and Crane (2017) is to involve users early and often. The focus on interaction design, usability and functionality aspects during evaluation and prototyping of Publizebra, based on the identified user needs and value-adding features is a deliberate approach to user-centered design as a methodology while acknowledging the limitations it imposes for conducting user-centered design by the book.

In order to reach a prototype state where user-centered design aspects of research, analysis and practical design has been implemented, the design process of Publizebra follows a five-phase model commonly applied in digital library development with a user-centered approach (Snydman, 2013). The design model consists of strategy (A), discovery (B), information architecture (C), interaction design & visual design (D) and prototyping (E).

Figure 1. User-centered design development process step-by-step, including the additional stages of heuristic evaluation and expert evaluation.

12
2.2 HEURISTIC EVALUATION METHODOLOGY

In addition to the five-step design process is the use of heuristic evaluation, more specifically Jakob Nielsen’s (1990) usability heuristics once a functional prototype has been developed. Heuristic evaluation is the process of having usability evaluators inspect and analyze the service interface in relation to a set of heuristics and principles for usability (Nielsen & Molich, 1990; Manzari & Trinidad-Christensen, 2006). Through utilizing heuristic evaluation in the design process, Nielsen and Landauer (1993) argues that up to 75% of usability issues can be identified in the design. The ten usability heuristics developed by Nielsen is an extensively adopted evaluation methodology in user-centered design (Manzari & Trinidad-Christensen, 2006; Still & Crane, 2017; Barnum, 2011). The heuristic evaluation was conducted by a professional from the School of Library and Information Science in Borås with expertise in interaction design and heuristic evaluation. The motivation behind commending the heuristic evaluation to a LIS professional is following the notion of double expertise, where the evaluator holds proficiency in both usability and the product domain as suggested by Barnum (2011). The evaluation was thus performed by an individual familiar with applying the ten usability heuristics in the context of digital libraries and information science.

The evaluation was more specifically conducted by an expert at SSLIS in visual communication and web development, including the domain area of digital libraries. The evaluator was asked to visit and become acquainted with the live prototype of Publizebra, and then perform heuristic evaluation following the ten heuristics of Nielsen available directly on the prototype. Following the heuristic evaluation, a re-assessment of the prototype along with possible implementations, changes and improvements to issues and directives provided by the evaluator is performed to enhance the design and usability of the prototype (Still & Crane, 2017).

Heuristic evaluation is according to Still and Crane (2017) a reliable and swift evaluation method for user-centered design, yet valid criticism of the methodology exists in the very reliance on heuristics (Hall, 2017). The results of heuristic evaluation according to Stickel et al. (2011) are eminently affected by the knowledge of the evaluator, meaning that the outcome may vary from project to project. Further, the use of heuristics according to Hall (2017) involves an interpretation of each heuristic on an individual basis by the evaluator, where a project then has to put confidence in the validity and perception of the heuristics by the evaluator. In order to balance the potential vulnerability of the heuristic model, an additional evaluation methodology is conducted during the iterative development process seen below.
2.3 EXPERT EVALUATION METHODOLOGY

The completion of a heuristic evaluation concludes one formal evaluation, which is regarded a minimum requirement by Goodwin (2009) prior to launching a product. The occurrence of any subsequent testing or evaluation process of a prototype is then depending on the heuristic evaluation result, scope, limitations and objectives of the project (Goodwin, 2009; Rubin & Chisnell, 2008). The next step of user-centered design for Publizebra is the method of expert evaluation for identification of usability issues and review of functional design (Goodwin, 2009). Expert evaluation or expert review, is a method of usability evaluation, consisting of having experienced professionals in fields of usability and design go through and test the prototype, actively searching for apparent and possible problems in the design (Ibid.). In contrast to heuristic evaluation, the expert evaluators will base the review on personal knowledge of usability, design and the subject domain rather than a set of predefined heuristics (Hall, 2017).

However, the contrast in lack of clear heuristics to adhere to during evaluation does not mean that the experts are fully given free rein to review and assess the prototype without instructions. While there is no universal definition of what may be included in an expert evaluation (aside from the use of experts), Goodwin (2009) argues that an expert evaluation conducted with attention to the realistic user goals and functions of a service, will perform better at identifying and understanding the severity of issues. Following the approach above suggested by Goodwin (2009), the expert evaluation is strongly focused on the functionality and design of user goals and features implemented in the prototype. In order to maintain consideration for the end-user within context of the service, the expert evaluation of Publizebra consists of realistic task-based usability testing followed by a design review. The expert testing segment adheres to a design approach for usability testing established by Rubin and Chisnell (2008) based on a rigid test plan presented further in chapter G, with an exploratory study of tasks to evaluate high-level operations and concepts of the digital library with a focus on usability and interaction design. The design review follows a conventional grading of usability and design elements once the prototype has been fully assessed, which is typically included in an expert evaluation (Goodwin, 2009)

The motivation for selecting expert evaluation of realistic tasks as the second methodology of usability evaluation, over methods such as focus groups or usability testing directly with end-users is based on the limitations of the project, and the early stage of development that Publizebra is in. Rubin and Chisnell (2008) argues that the use of expert evaluators over sampled end-users for testing can be more effective, accurate and logical for projects with time limitations and in the initial stages of development. Prioritizing expert evaluation in these time-limited situations is due to the critical transgressions of usability and design principles that may still exist within the newly designed prototype (Ibid). The idea according to Rubin and Chisnell (2008) is to avoid having a meticulous selection of testers brought in to point out and concentrate feedback on basic usability and functionality issues, that could have been identified by a smaller set of experts.
According to usability expert Harley (2018) of the renowned Nielsen Norman group, expert evaluation can serve as an effective part in the planning of future usability testing sessions with end-users. The evaluation method may not only, as previously stated, point out predictable and obvious issues in a new design, the experts may further highlight interesting or uncertain areas of the design to focus on during future usability testing (Harley, 2018.). The strength of expert evaluation is thus believed to be the abolishing of clear design errors and the attention given to areas in need of further studying, so that usability testing may result in unpredictable issues and feedback of end-users that could not be provided by experts (Ibid.).

2.3.1 SELECTION OF EXPERTS

According to Harley (2018) it is possible for any expert evaluation to be performed by one to four individuals with expertise in principles of interaction design, usability or cognitive human behavior. Arguably the range of potential evaluators to then choose from is relatively wide, especially depending on what qualifies as expertise (Ibid.). For Publizebra to narrow down the selection process of evaluators while attempting to increase the potency of the review, experts were yet again recruited from SSLIS. The motivation behind the selection is based on the criteria of a double specialist, as defined by Rubin and Chisnell (2008); where an expert in the domain area or technology along with interaction design may perform more effectively. The notion of Publizebra being a digital library developed with a user-centered design methodology places it in the context of usability and interaction design, along with library and information science.

The expert evaluation was performed by three lecturers from the Borås LIS faculty tutoring in courses of interaction design, web development and technologies of digital libraries. The domain expertise of digital libraries held by the evaluators was highly valued for the project due to the early stage of development that Publizebra is in, and the potency of expert evaluation to give future usability studies key areas to focus and improve on (Harley, 2018). Having insight in digital libraries was thus believed to be of benefit in order to highlight possible design issues, solutions or concepts related to the domain that may have been overlooked based on the heuristics during previous prototyping.
2.4 THE IMPORTANCE OF STRATEGY

In providing a comprehensive framework for designing and planning the development of digital library services, Buchanan (2010) points out the critical importance of establishing a well-planned strategy when designing digital library services. Without a consistent and defined strategic plan, digital libraries may end up with an insufficient understanding of their role and with unanticipated influence by other actors and interests (Johnson et al., 2004).

The structure and components of a strategic plan is not universal and there exists a profusion of different interpretations of how a strategic plan should be ordered, yet there exists a strategic pattern for digital libraries identified by Buchanan (2010) and replicated by Mendelson et al. (2013) in a digital library setting. The strategic components included are broadly referred to as vision, mission, goals and strategic action; components that are described based on organization policies and design principles such as privacy concerns, open access, user-centered design or information strategy (Buchanan, 2010). The strategic plan established for Publizebra is substantially important to understand the capabilities and limitations of developing a digital library prototype in the context of an applied research master thesis, by being aware from the very inception of available time for development, assets and technology to set realistic goals, mission, vision and strategic choices.
3 THE DISCOVERY PHASE

The fundamental and exploratory section of research in this applied thesis is conducted during the discovery phase where empirical data is reviewed, presented and analysed. The discovery phase follows the RABBIT user-centered design process as defined by Still and Crane (2017) in researching users, scanning the competing services and environment, defining project goals and setting requirements while balancing user needs with project limitations. In the process of identifying user needs, stakeholders and competing platforms in the development of digital applications with a user-centered design approach, qualitative research methods are according to Goodwin (2009) favorable over quantitative. The effectiveness of qualitative research in designing digital applications is due to its capacity of understanding user behaviour by directly collecting and analyzing information of how users and testers behave, respond and express their needs without being dependent on large amounts of quantitative data (Ibid). The analysis and research methodology of the discovery phase is a qualitative process, through conducting an environmental scan, user need assessment, project objectives and requirements document.

3.1 ENVIRONMENTAL SCAN

Environmental scanning is regarded by Goodwin (2009) as fundamental to the research stage of design, through review of competitors and available literature within the field. According to Auster and Choo (1993) the importance of an environmental scan is collecting relevant information from a wide range of quality sources including reviewing published material, surveys, literature, reports and conversations. The empirical data used for the Publizebra environmental scan attempts to aggregate such broad selection of works and sources. The fundamental research covered in the environmental scan of Publizebra will serve as a literature review and focus on two main areas of interest for the development of a user-centered special digital library for self-publishing.

Initial research is focusing on case studies of special digital libraries where the process user-centered design has been implemented, evaluated and analysed. The motivation behind selecting these, is to investigate what has previously been done in the field of special digital libraries and the role of user-centered design in these projects. The case studies hold real-world documentation of the development processes, prototypes, features and use-cases of user-centered design. The analysis, evaluation and results of previous research may further highlight critical aspects and issues in the context of special digital libraries and user-centered design for Publizebra to acknowledge.
The second area of research is the realm of digital services, tools and features for self-publishing provided by public libraries. Reviewing the existing services and features is of critical importance to the development of Publizebra, as it highlights the tangible functionality and rationale of various models relating to the problem formulation and research questions of the thesis. Examining these digital services may reveal solutions, common and unique features of self-publishing that have been developed, as well as the stakeholders and possible motivations behind them (Goodwin, 2009). The environmental scan establishes what can be learned from previous user-centered special digital library projects, further the scan will reveal how features and services of public libraries correspond to the particular strategy of Publizebra, and if they can be approached or adapted in new ways (Ibid.).

### 3.2 USER NEED ASSESSMENT

The assessment of user needs is a research strategy to identify and analyse needs of users and stakeholders through the studying of the perceived users with qualitative and quantitative measures ranging from literature reviews, surveys, interviews and observed studies (Geisler & Vine, 2014; Goodwin, 2009). To gain insight of self-published authors, the discovery phase includes initially reviewing literature concerning user needs and value adding features of self-publishing found in the context of public libraries, to reveal issues and important factors from the perspective of library professionals that are dealing with book acquisitions, providing self-publishing support and meeting self-published authors in their daily operations (Sandy, 2016). Further the needs assessment is based on reviewing the opinions, concerns, frustration, success and ideas of self-publishing authors themselves, through an extensive literature review of surveys, interviews, research, blogs and communities where the user needs and value-adding features of independent authors are in focus.

### 3.3 STATED NEEDS, REAL NEEDS AND UNSTATED NEEDS

In addition to exploring and presenting the available research on user needs and value-adding features of self-publishing, the findings will be analyzed and discussed following a core set of concepts as articulated by Kotler and Keller (2017) as stated needs, real needs and unstated needs. The distinctions between different type of needs seek to elaborate the understanding of what a particular need consists of, in order for a product or service to offer a solution or market to the existing needs (Ibid.). Stated needs are what users or customers say they want, such as the author wanting to publish a high-quality e-book, the real need is then what the author actually requires, in an e-book that is professionally created through a self-publishing service with quality standards of e-books (Ibid.).
Unstated needs are requirements that have not been explicitly expressed, such as the author expects to gain insight in the publishing process of e-books through using a publishing service (Ibid.).

To identify different types of needs will be of value in developing and prioritizing the features of Publizebra, when recognizing the notion stated by Keller and Kotler (2017) that individuals may not be fully conscious of a need or capable of articulating it clearly. Solely pointing out stated needs in the wide range of opinions and expressions found in the literature review without attempting to understand the underlying needs could result in missing out on potential features and resources for authors. The assessment and distinction of needs will help to triangulate the field of study, in order to chisel out and articulate user personas of the digital library service, as particular user needs may differ and arise based on personal characteristics, traits and goals identified in research (Dobreva et al., 2012).

### 3.4 PROJECT OBJECTIVES

Aside from the outlined strategy of Publizebra prior to and leading the research and development stages, the project objectives are set once research findings and a greater conceptual understanding of the project has been gained. The objectives of the Publizebra project are thus re-assessed and redefined based on priorities, solutions and findings of the discovery phase in relation to the strategic choices of Publizebra in order to scope and develop a service and application that is plausible while following user needs.
3.5 REQUIREMENTS DOCUMENT

Requirements prioritization is a technique of collecting and grouping functions and features of an application or service in a document with lists of priority level, stating the requirements of a service and giving an overview of what it will do (Vestola, 2010; Snydman, 2013). This thesis applies a prioritization technique where features and functions are classified according to their level of importance in groups of “Must have”, “Should have”, “Could have” and “Won’t have” commonly referred to as the MoSCoW technique (Ahmad, 2017; Vestola, 2010). “Must have” sets the features that have to be included in the prototype while “should have” are implemented if feasible depending on time and scope, “could have” represent features that would be nice or appealing to include without being a major undertaking in development, “Won’t have” are features that could be implemented in the future not deemed of importance in the prototype version (Ahmad, 2017).

The prioritization of features into these groups will be based on the findings of the environmental scan and user need assessment along with the project objectives and set strategy, where importance of being implemented is the basis for prioritization.

As the discovery phase investigates general user-centered features, user needs and value-adding features of independent authors, it is important to note that the features listed internally within each group have no hierarchical ranking (Vestola, 2010). The use of MoSCoW to define and prioritize features of the service further follows user-centered design principles of discovering which features users will need and want most importantly, so that non-contributing features are not prioritized (Still & Crane, 2017).
4 INFORMATION ARCHITECTURE

In the design of websites and digital services, information architecture is a commonly used term for describing and establishing the functions, structure, layout and configuration of the whole service, rather than particular features (Parush, 2015). Informational services are according to Goodwin (2009) uncommonly dealing with advanced tools, actions or data for users to manage and is instead focused on providing users with the right information or feature. In order to deliver the user needs of particular information or features, Goodwin (2009) then points to information architecture as essential in mapping out the relation and interaction of the user needs and features of a service. The information architecture segment consists of three methods for driving the development of Publizebra forward while providing structure to the user needs, strategies and ideas set for the project. In this chapter the framework of the information architecture is established, to then be extended upon and practically presented in the development stage of chapter C.

4.1 CONCEPTUAL MODEL METHODOLOGY

One of the initial stages of information architecture lies in establishing the functional chunks of the service and links between these through the use of a conceptual model (Parush, 2015). According to Sharp et al. (2015) the conceptual model provides a framework and strategy for concepts and relations between them. The use of conceptual representation for abstract concepts and mental models is according to Parush (2015) related to fundamental ideas of human understanding and perception, where in order to understand an intricate concept or network one must create a structured representation of elements and links between them. In the context of interaction design, creating a conceptual model will help structuring the underlying content and routes of an UI, to improve performance by visually understanding the relation between functions (Ibid.).

For Publizebra, the development of a network conceptual model will move the defined requirements and features of the digital library from a more abstract textual representation of findings and requirements in different sections of the thesis, into a structured and visually comprehensible map (Ibid.). Having a visual representation of what Publizebra should contain and provide will ease the iterative creation of wireframes and prototyping by understanding and reflecting upon the network of features and relations within the conceptual model.
4.2 USER PERSONA METHODOLOGY

According to Goodwin (2009) user personas are design and product definition tools, that from the inception of development will help to visualize what it is users will need the most from the service. Unlike simply stating the findings of research, personas are storytelling archetypes of service users expressing patterns of behaviour and goals identified in research (Ibid.).

User personas may function as a set of characteristics that define a particular type or group of users that are distinctively different to other groups or users based on their characteristics (Still & Crane, 2017). The information and traits that have been gathered in research and channeled into personas help define a range of design decisions, such as aesthetics, terminology, information architecture and features that will work with the identified personas (Goodwin, 2009). One single persona does not represent a single individual, but a decisive amount of potential fictional users with comparable goals and characteristics, where multiple personas form the wide spectrum of service users (Goodwin, 2009; Dobreva et al., 2012). Rather than focusing on a common mistake of creating opus stories of the life of a persona, Goodwin (2009) argues that the most important features to establish is the mental model of goals along with their behaviour and skills. Utilizing personas in the development and design of a service is a widely adopted process and according to Still and Crane (2017) essential to user-centered design.

There exists criticism towards the use of personas, as Chapman and Milham (2006) argues that it is impossible to know if one persona represents millions of users or not a single one due to lack of validity in the methodology. There is however a perceived strength to the method, as Goodwin (2009) along with Dobreva et al. (2012) argues that humans may naturally be more engaged and remember traits and user needs when dealing with personas than just looking at data. Having a set of personas will help to retain an active vision of the end users during the design process, by being able to recall and analyze if these choices would be of use for the goals and needs of personas (Still & Crane, 2017). Publizebra seeks to build upon three distinct personas and visually present these based on fundamental principles by Goodwin (2009) in articulating scenarios, user goals and goals or requirements of Publizebra to fulfill these. The visual presentation of personas will draw from structures used by Snydman (2013) in a digital library development setting.
4.3 WIREFRAME METHODOLOGY

The creation of wireframes is usually initiated once the strategy, user needs, scope and objectives of the project has been established during the previous stages of development (Garrett, 2011). Wireframes are used to present the skeleton of a service and display the planned layout of the interface, with features and content in various degrees of detail from low to high fidelity depending on necessity for the project or product (Still & Crane, 2017). In the context of Publizebra, focusing on interaction design and functionality of the prototype, medium-fidelity wireframing will be used where colors, images or detailed content will not be required to structure and visualize the skeleton of the service (Ibid.).
5 VISUAL DESIGN AND INTERACTION DESIGN PRINCIPLES

While the entire development process from strategy to information architecture will shape the design of Publizebra, Goodwin (2009) along with Sharp et al. (2015) points to the importance of established design principles to guideline and select efficient ways to present and structure features and information of the service, in order for users to utilize it with less effort. Design principles are applied in the smallest of details to high-level functions that correspond to perceived behaviour of users and to improve the user experience (Goodwin, 2009). This thesis will rely on design principles for visual design and interaction design as laid out by renowned design experts Krug (2014), Goodwin (2009) and Sharp et al. (2015). In this section the fundamental principles that will guide the design process through the development process, prototype and visual profile of Publizebra are established. The principles and design decisions are then practically presented in the prototyping segment to demonstrate how these are applied and followed on the Publizebra platform.

5.1 VISUAL DESIGN PRINCIPLES

The main principles of visual design are following a set of measurements to allow for excellent and clear communication as suggested by Goodwin (2009) along with Krug (2014). In terms of visual aesthetics, Publizebra will pursue a minimalist and modern design where the design principles below are providing guidelines for appeal and functionality.

5.1.1 USE OF AFFORDANCES

To visually communicate the functionality of elements can be improved through the use of visuals hints in the form of affordances as established by Gibson in 1977 (Gibson, 2015). In web design, affordances are used to imply further interaction and functionality of particular elements through highlighting with the use of warm colors and gradients on protruding buttons, clickable links and features (Goodwin, 2009). The affordances become part of the design language and should serve a point and not be confusing or over-used by giving users distracting, overabundant actions (Krug, 2014).

5.1.2 VISUAL HIERARCHY

In order to accentuate essential actions and information on the site, the use of effective visual hierarchies means indicating the relation between elements and priority of things while placing content in proper order and context to make web pages swift to understand (Krug, 2014).
The visual hierarchy of elements is transmitted through creating contrast in color, size and placement of objects to draw attention to important sections or starting points (Goodwin, 2009). In the context of web pages, elements such as headers, boxed content and features can be visually emphasized through contrasting colors, frames and varying the size of objects across a page such as large text size for critical information and smaller for additional information (Goodwin, 2009).

5.1.3 RECURRENCE OF ELEMENTS FOR UNITY

In line with the set strategy of Publizebra, consistency and unity in the final design is important. Through repetition of color, icons, content, elements and typefaces spanning across the service Goodwin (2009) argues that a sense of unity is achieved and will further allow for elegant design. The idea of elegant visual design means forming a coherent consistency that will harmonize the elements of the site, to not give users odd and clashing inconsistency in the behaviour and look of the website (Ibid). The result should not however be a grey and completely invariable design, as visual inconsistency is to some extent applicable to create efficient and contrasting elements that will add zest to the site and make objects uniquely stand out (Ibid.).

5.1.4 UNDERSTANDABLE AND RECOGNIZABLE ICONS

Aside from the consistency of icons used as laid out above, there are general design principles to follow in terms of type of icons being utilized on the site. Figuring out the visual information of an icon should be simple yet distinct in visual appearance according to Goodwin (2009), where the use of identical shapes and borders or overly detailed icons will take an increased effort to recognize. The web has formed a set of icons that often hold a standardized appearance, are broadly used and recognizable such as search or share (Krug, 2014). Publizebra will apply standardized icons and place these in a consistent and relevant context, further to avoid combining icons with objects or actions that are not commonly recognizable or understandable for the user personas (Goodwin, 2009). Due to the special interest that Publizebra deals with, there will be icons that are relatively bound to the context of self-publishing and thus more aimed at the personas, rather than standardized icons across the web. The use of icons should always be combined with textual information to give meaning as stressed by Goodwin (2009).
5.1.5 READABILITY AND SIMPLICITY

To maximize the readability and usability of the content and information provided on a site like Publizebra, the design will follow basic alignment standards of elements and text to further create a sense of simplicity and order across the site (Goodwin, 2009). Through left-aligning text, features and content and right aligning integers such as book measurements and widgets readability can be improved (Ibid.). To further increase readability of paragraphs and content, Krug (2014) suggests using bulleted lists where applicable. Additionally, the size of typefaces is an important factor of readability, where Goodwin (2009) points to the use of typefaces that are functional at smaller sizes.

5.1.6 REASON FOR EVERY DECISION AND HAVE A PURPOSE FOR EVERY ELEMENT

Eliminating distractions and understanding the usefulness of every object, by removing unnecessary elements and reasoning for all decision made to the visual design will give logical purpose to each and every object and function be it a small- or high-level details (Goodwin, 2009). The reasons and purposes must thus not be grand, it could relate to any of the stated design principles laid out in the project such as being implemented to improve readability, affordance or create visual hierarchy (Ibid).

5.1.7 SEARCH FOR INSPIRATION IN DESIGN LANGUAGE

While the established design principles of Publizebra will form a design language and guidelines for creating and designing the service, professional designers will according to Goodwin (2009) often find inspiration and insight through looking at other services and their design principles. The discovery phase of Publizebra researching both user-centered digital libraries and services for self-publishing will gather visual information, where inspiration can be gained for both usability and aesthetic purposes; What previous projects have achieved should not be overlooked.

5.2 INTERACTION DESIGN PRINCIPLES

To understand interaction design and its intersection with visual design, Goodwin (2009) recognizes the impact visual design principles have on the visual profile and production, while pointing to the possibilities for interaction design principles to enhance the visual by establishing interactive balance and functionality that the visual design might overlook. Central to the idea of interaction design according to Sharp et al. (2015) is the understanding of users and creating interactive services with benefit for these.
The interaction design of a service is then based on particular choices made in order to provide an appealing user experience, supporting users in their existing needs and recognizing the capability of users (Ibid.). The outcome of a well-designed service is one that is accomplishing the needs and wants of users in an anticipated manner that will keep the cognitive and visual load to a minimum (Goodwin, 2009). The interaction design principles of Publizebra are thus central to the idea of creating user-centered design while also guiding and adding to the visual design framework.

5.2.1 MAKE USE OF CONVENTIONS

The understanding of users includes recognizing common conventions in the context of which the product is being developed (Krug, 2014). Publizebra exists within the realm of websites where conventions relate to what and where objects are located on a site, including placing of logotypes in the top-left corner and the presence of a search option and home button (Ibid.).

5.2.2 BREAK UP PAGES

Related to the idea of visual hierarchies as established previously is the concept of breaking up pages in distinctive and clearly defined sections to enable for users to identify with ease what parts are of interests and which are not (Krug, 2014). Utilizing structure and visual cues similar to form visual hierarchies of menus, drop down menus, headers and page sections will make relationships and differences more apparent (Ibid.).

5.2.3 SUPPORT SCANNING OF CONTENT

Krug (2014) argues that most users of a service will seek to initially scan through the content to find and navigate towards objects of interest rather than extensive reading of every detail. The idea of creating a design that will be perceived to involve considerable time for the user to utilize will according to Sharp et al. (2015) risk being neglected in favor for simple and efficient solutions. Scanning through content on a website can be achieved through clear use of descriptive and relevant headers for content, to function as a sort of table of contents while browsing the site (Krug, 2014).
5.2.4 PERSISTENT NAVIGATION

In web design the notion of persistent navigation refers to the use of navigation tools that are occurring across every page of a website to not only allow consistent navigation for users, but to reassure the visitor that it is navigating internally across the site and not being sent somewhere else (Krug, 2014). Similarly to the use of unique exceptions in repetition of elements for unity on a site, Krug (2014) suggests to create a clear distinction to the site consistency with the use of forms, as writing and using the form should be isolated and in focus rather than persistency (Ibid.).

5.2.5 DO NOT GET LOST IN SPACE

To provide users with navigation cues of the current location on the site while indicating where it is placed in a greater context of the site can according to Krug (2014) help users to get a sense of their current location on a map, while balancing the web design issue of being lost in space without physical and logical navigation across rooms and places.

The use of highlighting the current page on the primary and secondary menu is an effective method to indicate a you are here, and how you can get back concept (Ibid.).

5.2.6 HOME PAGE PRINCIPLES

Further adding to the navigation and functionality of a site, the presence of a home page is essential to provide users with a static and constant place to start and return to (Krug, 2014). When designing a home page for an informational site such as Publizebra, Goodwin (2009) points to the importance of recognizing that the various visitors are entering the same site with very different user needs. To cater and provide unique home pages for various user needs is by Goodwin (2009) deemed as impractical, and that the main focus in the design should be to let users find the object and information they are seeking. Having extensive knowledge in the field of interaction design, Krug (2014) provides a set of principles that are well in line with the above claims of Goodwin (2009). Initially the home page needs to convey a site identity along with its mission, so that the visiting user can understand why it is there and how it may be of use including where to start (Krug, 2014). Further, the interaction design expert points to the use of teases of information on the home page to attract users with previews of intriguing content within the site (Ibid.).

Extending the appeal of the site, promoting content on the site can highlight the latest and most prominent articles and features of the site (Krug, 2014). While the home page should provide access to content of interest for the user it must further expose the content one may not actively be seeking but still find use of down the line (Ibid.). Following the home page principles advocated by Krug (2014) is an important interaction design goal of Publizebra.
5.3 SO WHERE IS USER EXPERIENCE IN ALL OF THIS?

Having read this far of the thesis you might be wondering about where and how user experience (UX) will play a role in the Publizebra digital library project. The topic of UX is strongly tied to the process of user-centered design, where an understanding of users and the main objectives of developing a product for the user is a central concept according to Sharp et al. (2015).

The objectives themselves may however range from time and interaction efficient usability solutions to stimulating encounters for users, and which one is more important for the experience of users and the goals of a service makes UX difficult to define by absolute principles (Ibid.). To describe objectives in order to achieve them, Sharp et al. (2015) suggests setting up and separating goals of usability and user experience respectively; where usability refers to accomplishing particular operations efficiently or constructively, and user experience to provide an appealing or gratifying experience. There is however a problem with splitting and defining objectives as adding to the experience of a service or not, as Sharp et al. (2015) argues that usability is essential to creating an excellent experience, and vice-versa for the usability of a service where the impression and expression of the service affects the usability.

The prototyping of Publizebra will focus on the usability and functionality of the site as seen in the visual and interaction design principles and the set-out usability evaluation, while fully recognizing the importance of setting up and achieving user experience objectives in a fully developed user-centered service. Partially related to the limitations of this thesis, to properly work on user experience objectives would require not only further development of the service, but further involvement of real-world users, research, testing and evaluating that is the subject of a thesis in itself. Simply stating a user experience objective within this thesis and writing off UX as completed would be a disservice to the scale and importance of UX for user-centered design and digital libraries. Therefore, this thesis is focused on functionality and usability first hand, while putting value in the feedback and impressions from the expert evaluators as a stepping stone towards better user experiences and future involvement of end users as suggested by Harley (2018).
6 PROTOTYPING METHODOLOGY

Prototyping is believed to be an important aspect of design and becomes useful in the evaluation and exploration of design ideas while encouraging reflection of the design used (Sharp et al., 2015). For Publizebra the prototype will serve as a tool for evaluation and testing the overall service and the feasibility of ideas found during the previous stages. The prototyping stage follows a design methodology as put forward by Goodwin (2009) in order to reach a state of high-fidelity.
A. THE STRATEGY OF PUBLIZEBRA

The main vision of Publizebra is to establish a prototype digital library service where Swedish independent authors can discover important aspects of self-publishing and increase their knowledge of authorship and book production. To work towards this vision, the mission of Publizebra lies in understanding how to efficiently provide a digital library service that is available for authors, and based on identified user needs and features designed in a user-centered manner. While the vision and mission statements according to Buchanan (2010) are long-term components, it is relatively difficult to reach a point where the vision and mission can be regarded as definitely completed or concluded, especially as user needs and consequentially user-centered design is constantly evolving and services have to adapt accordingly (Goodwin, 2009; Dobreva et al., 2010).

To head in the right direction and gain a level of accomplishment towards the vision and mission, the strategy goals of Publizebra are milestones to reach during development to warrant that the overall strategy is not forfeited. The milestones are as follows:

1. Provide valuable information and features for self-published authors in an accessible and sustainable approach.
2. Provide functional and accessible navigation and interaction between features and resources on the digital library platform.

Along with vital milestones of the digital library development process, the stated strategy includes a set of quantifiable objectives as put by (Buchanan, 2010) that Publizebra seeks to complete as short-term targets within the thesis:

1. Identify a set of user needs and practical features of benefit for self-publishing authors.
2. Design and implement a set of features and content corresponding to user needs while balancing it with project limitations.
3. Apply consistent user-centered design principles to content and the site.
4. Launch a prototype version of the Publizebra digital library that is available online.
5. Perform evaluation of the prototype in the form of heuristic evaluation and expert evaluation.
Accomplishing the strategic goals and objectives of Publizebra are formulated to result in effectively creating a digital library prototype, that is then capable of development towards the long-term vision and mission statements based on further testing and improvements of the service. In order to attain all milestones and targets there are however according to Buchanan (2010) critical strategic choices that have to be made related to the short-term goals and plans of the project.

In the development of an Einstein-oriented special digital library by Mendelson et al. (2013) the strategic choices were based on goals of online accessibility, discovery and navigation capabilities that strongly impacted the strategic choices in technologies, methodologies and design approaches. Similarly, Publizebra has to decide upon strategic choices that will make sense for the stated goals and targets. The strategic choices are as follows:

1. Prioritize accessibility in the use of digital library assets by providing no resources or information behind registration or email opt-in walls.
2. Promote sustainability through reflecting upon requirements and long-term usability of content and applications developed on the site.
3. Due to the scale and limitations of the project, development will follow a lightweight approach of building and applying user-centered design principles based on a wordpress frontend.
4. Information retrieval and search. The prototype relies on wordpress search and retrieval functionality, while marking up and tagging content as much as possible, searching should be functional while not providing any complex query formulations or custom IR systems.
B. DISCOVERY PHASE - ENVIRONMENTAL SCAN

B.1 USER-CENTERED SPECIAL DIGITAL LIBRARIES

The first topic to discover is the area of special digital libraries where user-centered design methodology or philosophy has been applied during development to improve functionality, identify user needs or in evaluation of the service. For the thesis to review every special interest digital library, where user-centered design to a lesser or greater degree has been knowingly or unknowingly applied during development would be a difficult endeavor. Therefore, the selection criteria of user-centered special digital libraries to review in the environmental scan will consist of three libraries, where previous case studies have been conducted and the notion of user-centered design is a central focus.

Traditionally, the development and research on digital libraries has concentrated on technical aspects of software infrastructure, browsing tools and information retrieval technology without a strong user-centered design approach consulting user needs and issues, resulting in a lack of knowledge in how the end user will make use of the proposed tools (Khoo et al., 2009; Dobreva et al., 2010). The development and evaluation of digital libraries is according to Dobreva et al. (2012) increasingly turning to the understanding of how users interact and make use of the services, through user studies and assessment of information behavior.

B.1.1 THE APOLLO MUSIC DIGITAL LIBRARY

Bainbridge et al. (2012) covers the design, development and evaluation process of a special digital library aimed at providing amateur musicians a composition tool that could capture compositions and snippets of music with a user-centered design approach. The notion of software to record musical ideas was not something new, the attempt was to enhance and enrich the user experience through a new form of interaction approach and organizing options (Ibid.). The design process involved a diary user study that forced the studied users to carry a recorder and notebook to record their ideas and write down composition behaviour (Ibid.).
The carrying of an additional item to write down notes was perceived as forcing upon a new behaviour for the users, and it did not prove very efficient in the study to understand how users would go about writing down music in their daily lives (Ibid.). However at the same time providing important insight in where to start development; the users already had their established behaviour of recording and did not need it changing by carrying utensils, which exemplifies the need for user-centered design to understand the user rather than forcing to change a behaviour (Bainbridge et al., 2012; Bašić, 2018).

Software development was thus moved from the stage of recording as first envisioned, to the use of APOLLO once ideas had been recorded and uploaded to the creators’ computer (Bainbridge et al., 2012). Reviewing competing services and observing additional user behaviour post-recording led the research to change the developers’ perception of what the service would provide, by moving from the traditional file and list based design of competitors, to a visual sketchbook approach where users could with freedom in layout add multiple recordings, comments and annotations in an hypermedia environment that potentially could hold multiple ideas (Ibid.). During evaluation of the iterative user-centered design process that lead to the idea of an artists’ sketchbook for musicians, the researchers found justification for designing such a service as users found it usable and simpler to locate ideas in this model compared to browsing a textual list of files (Ibid.).

B.1.2 VisInfo - TIME SERIES DIGITAL LIBRARY

Bernard et al. (2014) thoroughly presents the development and evaluation of a special digital library in a visual search environment for large sets of time series data for researchers to conduct information visualization and visual analytics. Moving away from traditional search and retrieval processes of library collections, VisInfo had to focus on returning visual results of data in an exploratory and functional design for end users of the data as well as library stakeholders (Ibid.). The development process involved an extensive user-centered design approach with interdisciplinary participation interviewing scientists from the user domain to digital librarians, usability experts and data curators to investigate the environment and define problems followed by heuristic evaluation of an implemented prototype for iterative improvement (Ibid.).

While VisInfo provides an advanced set of features for an expert group of users that requires functional interaction in both retrieval and use of data, the project reported findings in evaluating the user-centered design approach that may be of interest for any digital library service. Offering a new tool for experts within a scientific domain resulted in a lack of trust in the VisInfo service, as the users preferred a level of control based on use of data and tools that they were already familiar with (Ibid.). The new service thus had to prove itself worthy, through focusing on delivering a product that would comply with the user need of control through detail-on-demand options of the visual data, that is then accurate and visualized in high-resolution to increase trust and usability of the service (Ibid.).
The notion of usability meant reducing the familiarization process for users, Bernard et al. (2014) underlines the importance of considering usability aspects early in project development to avoid creating barriers of familiarization, recognizing the end user from the inception of development while iteratively identifying barriers through evaluating prototypes.

B.1.3 PALMER LIBRARY AND INFORMATION SCIENCE DIGITAL LIBRARY

The development of a user-centered digital library aimed at LIS post-graduates at the Palmer School of Long Island University, NY was investigated by Manzari and Trinidad-Christensen (2006). The specialised service sought to provide access to LIS journals and databases listing subscriptions based on subject and title, while giving general overview of LIS library resources and contact information, opening hours and staff (Ibid.). In addition, the digital library was designed to link to LIS-related websites and the main university library resources (Ibid.). Although the digital library was developed more than 15 years ago in 2005 placing it far ahead of any other service or project reviewed in this thesis, it follows user-centered design principles in a comprehensive and well-planned methodology of heuristic evaluation and iterative usability testing (Ibid.). The methodology and its results are providing detailed and valuable insight of how to develop a digital library based on expert input and user interaction, impressions and understanding of the service.

The motivation behind developing a LIS digital library was to update a previous site that simply described the LIS library, by creating a separate platform from the main library with unique purpose, aesthetics and structure (Ibid.). The heuristic evaluators consisted of LIS post-graduates with experience in web design and human-computer interaction, where the evaluation process was based on the well-recognized Nielsen principles (Manzari & Trinidad-Christensen, 2006; Nielsen & Molich, 1990). In terms of design, language and descriptions the evaluators were satisfied in the context of LIS, however there existed a consensus in concerns of clarity, interaction and consistency related to menus and page layout that could result in confusion for users (Manzari & Trinidad-Christensen, 2006).

The evaluated prototype received practical suggestions to improve the overall usability and clarity of the site in terms of navigation, as menu options and links had been designed by a LIS librarian with an anticipated use order, that was inconsistent from page to page and included acronyms of repositories and features that users were not guaranteed to be familiar with (Ibid.). The digital library was re-designed based on the feedback, and in the next stage usability testing was performed by observing and questioning LIS post-graduate students attempting to complete predefined tasks on the LIS digital library site (Ibid.). Results of the usability testing showed that most users had problems with the navigation between the special library and main university library redirected links, where the latter site displayed different and less appealing design and no clear navigation back to the LIS library (Ibid.).
The inconsistency and confusion between the pages called for an unified design applied across all pages and sites, where the main university library page would be replicated with the LIS library aesthetics and layout (Ibid.). Additional interaction design elements reflected concerns expressed during the heuristic stage, where users would strongly rely on a consistent menu structure with a home button that would get them back to the main site from each sub-page, rather direct sub-page to sub-page navigation (Ibid.). The research by Manzari and Trinidad-Christensen (2006) shows the impact on the final design of special digital library from heuristic evaluation and iterative response of users when an application has been developed based on assumptive decisions in the design of interaction and usability for what is to be a user-centered application.

**B.2 DIGITAL LIBRARY SERVICES AND FEATURES FOR SELF-PUBLISHING PROVIDED BY PUBLIC LIBRARIES**

Research on digital self-publishing services from the perspective of libraries (when excluding academic publishing) chiefly reside in an American context of public libraries supporting self-publishing initiatives in their local communities. Conrad (2017) argues that public libraries across the United States may become community archives by participating in self-publishing initiatives while promoting quality standards of self-publishing and providing new opportunities for marginalized groups to engage in the community.

To understand why library services and projects for self-publishing and the subsequential research covering these mainly emanate from USA, one may look to the existing well-established opportunities for self-publishing in the English-speaking market. There are an enormous amount of publishing services and tools such as Pressbooks, SmashWords, Lulu and Amazon with the latter reporting that over 30% of their e-book sales are self-published works, along with a majority of new authors neglecting traditional publishing (LaRue, 2015b; Matulionyte et al., 2017).

It is important to note that the existing research covering the development, progress and outcome of public libraries that are providing self-publishing services are not at first hand studying it through a critical digital library lens or user-centered design in analysis, research questions or aim of study. Rather, the area of research is a wider exploration of roles and opportunities between library and self-publishing, where digital libraries and services is part of a larger context. Hence there exists a lack of analysis, evaluation and discussion of digital services on their functionality and design as part of digital library services. The local rooting of public libraries as a physical space for communities means that while the notion of supporting self-publishing online is well recognized within these libraries as shown by Moulaison and Le Beau (2015) along with Conrad (2017), the digital services and projects that exist will often have brick-and-mortar operating elements such as digital authorship workshops and print on demand machines. The following section will review the various online digital services, features and tools provided by public libraries to promote self-publishing.

36
B.2.1 SELF-E

The joint venture of SELF-E between e-media vendor BiblioBoard and review resource platform Library Journal is a subscription service for libraries designed to support discoverability and inclusion of self-published e-books in public libraries on a state- and national level (Anderson, 2016; SELF-E, 2015). Since its inception SELF-E has quickly become a main subject of research in self-publishing and public library relations, understandably so as it is utilized across the United States on a relatively grand scale with over five large public libraries serving as beta testers, while adapted into many other projects (Conrad, 2017).

The SELF-E white paper is directly targeted to public libraries and their self-publishing opportunities, stating that these public spaces host an unique body well suited for independently published books to be created and distributed (SELF-E, 2016).

Pointing to concerns and difficulties for public libraries to incorporate and support self-publishing in their establishment, SELF-E is supposedly created to solve these issues and common mistakes (Holley, 2015; SELF-E, 2016). Through an online submission portal SELF-E connects independent authors and public libraries without the requirement of any physical interaction or manual acquisition, by letting authors submit their completed PDF or ePub book along with cover art into statewide self-publishing collections, that is then automatically accessible by SELF-E participating libraries subscribed to these collections (Bruno, 2015; SELF-E, 2016). Once an e-book is in the system, Library Journal acts as a curation service where submitted books are professionally reviewed by a panel of experts, and if deemed of exceptional quality it will be included in nationwide and genre-based collections of highlighted and approved books (SELF-E, 2016; Bruno, 2015). Authors that have passed the quality selection process and become part of the expanded distribution across public libraries nationally are rewarded with a badge signaling this accomplishment, that can then be used in promoting their authorship and e-book on other platforms and markets (Bruno, 2015). The quality selection procedure of Library Journal picking out works to be worthy of promotion is according to Bankhead (2015) similar to the gatekeeping process of traditional publishing in vetting of books, with the distinctive context of celebrating self-publishing.

The notion of discoverability is a key feature in research on public libraries support of self-publishing, as the inclusion of self-published titles in collection-development has shown to be lacking (Holley, 2015; Culley, 2017). Discoverability is according to the SELF-E founder Mitchell Davis the main tool of benefit above all else on the platform through the automatic inclusion and distribution of state- or nationwide collections to libraries (Lowe, 2015; Conrad, 2017).

SELF-E further provides e-book production and publishing solutions for libraries, through partnering with the online publishing tool Pressbooks aimed to provide free, seamless creation of industry-quality print and e-books with professional templates and designs, that will maintain the authors’ control of format and visual appearance without external designers or publishing services required (SELF-E, 2016; Anderson, 2015c).
Public libraries and librarians may then refer authors seeking to produce books directly to the SELF-E ecosystem rather than listing commercial self-publishing services (Ibid.). Further, there is also the possibility for public libraries that have developed or initiated in other self-publishing projects to submit e-books to the SELF-E statewide collections and take part in the curated quality selection by Library Journal (LaRue, 2015b). According to Verma (2015) SELF-E may establish a more inclusive publishing environments with the award system by featuring various groups and communities in society through targeted competitions and literary awards.

Implementation of SELF-E at the beta-participating Los Angeles Public Library was considered user-friendly by patrons and a majority of users were capable of finalizing the submission procedure without any assistance from library staff (Anderson, 2015b).

The Swiss-army knife model of providing public libraries with a digital service that promotes the discoverability of self-published e-books through both collection-inclusion, awards as marketing opportunities for self-published authors, along with book production software offered for free has not only received praise. The point of critique is due to the royalty free licensing, where authors by submitting their works grant institutions that are subscribed to the SELF-E collections full access to patrons without any economical compensation for the authors (Rooney, 2015; Bruno, 2015).

B.2.2 LAPL WRITES

The Los Angeles Public Library (LAPL) is a large system of central and regional libraries with over 22 million online visits annually that has been regarded a trailblazer in self-publishing initiatives, leading to be seen as a model for other libraries in embracing support of self-publishing (Anderson, 2015b). LAPL holds an extensive collection of digital material and media along with an extensive amount of public computers and in this environment, providing self-publishing services online has according to their acquisitions manager proven helpful for both patrons and staff (LaRue, 2015b; Anderson, 2015b). Through partnering with the all-round self-publishing model SELF-E for libraries, LAPL sought to connect local authors and readers while putting less weight on library staff by utilizing its automated collection-development of self-published works and referring authors to the SELF-E program for production and publishing (Ibid.).

While making the most of SELF-E in supporting authors, the digital services for self-publishing does extend further as LAPL has on their main library site developed the self-publishing resource LAPL Writes (LaRue, 2015b). The LAPL Writes web page is described as the local authors’ guide to the abounding amount of resources available through LAPL that is of benefit for authors (LAPL.org). LAPL Writes is functioning as a digital library dedicated to providing authors with aggregated books and material from the LAPL collection along with articles, databases, links, events and online resources that relate to the entire publishing process from production to marketing (LaRue, 2015b).
The online visitor may directly select from the main page various topics and sections, such as available books on editing and publishing, as well as access to Pressbook Press software to produce professional quality e-books and print (LAPL.org).

For the author seeking to succeed with self-publishing, LAPL Writes offers free enrollment and access to instructor led online courses such as Publish and Sell your E-Books and Introduction to Internet Writing Markets (Gale.com, 2018). SELF-E is integrated on the LAPL Writes platform and presented as an opportunity for e-books to reach a wider audience (LAPL.org).

LAPL Writes further provides LAPL SELF-E Select Authors; a unique collection of independent works that have been submitted to the SELF-E system by local authors and approved in the Library Journal quality selection process (Biblioboard.org; LAPL.org). The curated collection is accessible through LAPL Writes and hosted on the Biblioboard platform for immediate and free digital access to the awarded titles on a genre-basis (Biblioboard.org).

**B.2.3 LOS GATOS LIBRARY-SMASHWORDS COLLABORATION**

Seeking to add more self-published works to the local collection while increasing the support for independent authors without developing a costly proprietary platform, the Los Gatos Public Library partnered with the online self-publishing service Smashwords in 2012 to provide eBook Self-Publishing Partnership, a self-publishing program for their local authors (Pecoskie & Hill, 2014; Coker, 2013). The concept behind the service was to give local authors visiting the Los Gatos Public Library website access to an e-book printing press and publishing service by creating a co-branded web portal that would point the author to the self-publishing services of Smashwords (Coker, 2013; Bankhead, 2015).

Patrons browsing the public library web page would be offered free tools for self-publishing from the Los Gatos themed version of Smashword and gaining access to step-by-step guides on e-book production, distribution and marketing (Bankhead, 2015; Coker, 2013). The service did not simply throw authors in the care of Smashwords to forget about them, as signups through the co-brand page received emails customized by the library, and works published with appropriate metadata and standardized quality through the joint service would be available in a Premium Smashwords vendor catalog for the library to purchase (Pecoskie & Hill, 2014; Coker, 2013).
Bankhead (2015) argues that the eBook Self-Publishing Partnership service is fulfilling a circle by giving authors access to an e-book publishing press to produce, publish and distribute works that may then be available in the very online library catalogue that the author started at. The digital service was considered a success by the Los Gatos Public Library in regards to the rate of books published through Smashwords stemming from the public library site, and the co-branding model between public library and self-publishing service was replicated by the Seattle Public Library and Smashwords in 2014, resulting in signups by over 100 authors in one year (Ibid.). Further, Los Gatos partnered with the SELF-E program to offer an additional self-publishing resource for authors seeking to have their books in statewide collections or take part in the Library Journal award model (Ibid.).

B.2.4 BOOKBUSTERS

For a cooperation of regional organizations and public libraries in Minnesota, the fact that over 700,000 ISBN bearing titles in 2015 were self-published, was the starting point of the BookBuster project to provide state residents with a digital toolset for production, sharing and reading of self-published e-books; mnwritesmnreads.org, 2018). Through utilizing SELF-E for the support of self-publishing and distribution, while branding the platform in a local public library context BookBusters sought to reaffirm the role and position of public libraries as centers for creativity, community and diversity in Minnesota (Horton et al., 2018). BookBusters consists of two interlinked project platforms aggregated on a wordpress-based frontend that together form an all-round digital self-publishing service; Minnesota Libraries Publishing Project (MLPP) and MN Writes MN Reads (Ibid.). MLPP provides a geolocated version of the Pressbooks ebook publishing tool available for free through all Minnesotan Libraries, allowing library card holders to register a Pressbooks account to import text, add metadata, arrange, edit and design the book with professionally created templates and themes to then export in preferred format (Horton et al., 2018; MLPP, 2018). Further, MLPP provides instructional media resources along with step-by-step guides on how to create books using Pressbooks, while showcasing the books published on the platform (Ibid.). Similar to the other services previously investigated in this review, MLPP is utilizing the SELF-E discoverability feature by giving authors publishing through MLPP the option to include their e-book in the SELF-E statewide collection hosted by Biblioboard, and subsequently be reviewed by Library Journal (MLPP, 2018; SELF-E, 2016). MN Writes MN Reads acts as a lightweight, easy to use web portal for public libraries and authors in Minnesota providing and explaining all the available tools and services related to SELF-E; Create directing to MLPP & Pressbooks, Share linking to SELF-E & Library Journal, Read linking to Biblioboard self-published collection, along with quick access to contest winning self-published works in Minnesota (mnwritesmnreads.org, 2018).
B.3. ENVIRONMENTAL SCAN RESULTS

B.3.1 SUMMARY OF SERVICES AND FEATURES OF USER-CENTERED SPECIAL DIGITAL LIBRARIES

The Apollo special digital library provides practical features that are unique and limited to a very specific target group of users at a particular stage of their musical process, based on the user-centered design principle of discovering where the most important user needs are and developing the service from that point (Still & Crane, 2017). In doing so, the special digital library identified an unique approach to a user need that in turn proved to be efficient.

At the same time the functionality of the service is not limiting the scope of users, as the hypermedia environment invites users to utilize and interact with the service on an individual basis that does not limit its use to a specific technique or structure in the way that previous software has done (Bainbridge et al., 2012). The most important user-centered elements to learn from Apollo lies in the understanding of the user, by recognizing through user studies where the digital service may prove to be useful, and not attempting to change behaviour of users at a stage where it is not necessary to do so (Bainbridge et al., 2012; Still & Crane, 2017). For Publizebra it is highly relevant to discover where in the process of self-publishing that user needs exist and focus the primary tasks of the digital library to useful and innovative features corresponding to the user needs identified in the discovery phase.

The notion of considering users from the beginning to avoid creating a service that is not functioning for its perceived users is according to Still and Crane (2017) fundamental to user-centered design. The VisInfo digital library points to the importance of recognizing the user from inception and gaining their trust through appealing features and usability of the service that does not require too many barriers to familiarize with (Bernard et al., 2014). VisInfo provides valuable insight in the user-centered design process of a special digital library by displaying its initial failure to balance expert features and guiding users of how to use them by expecting the user to know certain aspects without iterative evaluation and testing during development to identify where guiding is needed (Ibid.).

Through heuristic evaluation and usability testing by users, the Palmer LIS Digital Library delivers insight in how practical user-centered design issues can be identified and are still prevalent even if the special digital library posed relatively non-complex features and purposes. The feedback from evaluation pointed to design gaps, features and behaviour of users in a small-scale special digital library that are as relevant in 2005 as 2019. For Publizebra, the most important aspects to consider from Manzari and Trinidad-Christensen (2006) is the need to avoid inconsistencies in design, menu and layout between pages, as well as always providing basic features such as home and search buttons even if there is an anticipated use in navigation between pages, even if there are very few pages.
The interaction aspect of a special digital library can further be improved by clarity in expression of concepts, such as not expecting users to understand acronyms and slight differences in wording that lead to different pages or features.

**B.3.2 SUMMARY OF PUBLIC LIBRARY DIGITAL SERVICES FOR SELF-PUBLISHING**

The environment of public libraries providing self-publishing services display interesting solutions and features for both independent authors and public libraries, where services like SELF-E present librarians with the option to refer authors to one service with features for publishing, discoverability, marketing opportunities as well as e-book production software (SELF-E, 2016). While the features provided by SELF-E are free and giving authors an arsenal of ways to tend their authorship and books, it is important to recognize the stakeholders involved to achieve it, whom according to Rath et al. (2017) always play a key role in the outcome of digital library services. Public libraries utilizing SELF-E are dependent on three commercial stakeholders that provide publishing and distribution, curation and e-book creation; meaning that the public library can only offer these features as long as the stakeholders stick to the model, as none of them are maintained or developed by the subscribing library. The reliance on multiple actors for the features of a digital service to function is an important aspect for Publizebra to consider before implementing features and developing the service, as it puts the notion of sustainability and accessibility in focus.

The service provided by LAPL Writes is aimed towards a local community of independent authors with features aggregated from library resources, authoring services and online courses (LAPL.org). The site displays clear-cut features for users to access, with a consistent layout between pages and a static header menu offering direct access to material and the main library page. Aside from utilizing the external SELF-E to its fullest by offering authors to be included in locally aggregated collections, the digital library has found ways to develop its own independent features for library acquisition, tracking local author events and workshops, recommending web resources and providing independent authors a platform through interviewing and linking to their works (Ibid.).

The major stakeholder being a public library, its features are geographically limited through library card access reducing its usability online for self-publishing authors. However, there are interesting features applicable in other self-publishing digital libraries; through collecting and presenting material such as books and information available online, highlighting events and pointing to acquisition policies that are openly accessible. LAPL Writes displays in a local setting how self-published material can be aggregated and offered in a simple and consistent format that could be of interest to consider during the development of Publizebra.
The idea of a lightweight support of self-publishing by public libraries in terms of the service offered has been advocated by Crawford (2012) through the use of simple publishing templates and providing authors with existing self-publishing print services. Los Gatos’ eBook Self-Publishing Partnership displays how including an e-book authoring service stakeholder that offers self-publishing from production to distribution and creating a local library themed iteration of the service is an efficient method to serve independent authors (Bankhead, 2015; Coker, 2013). While Los Gatos is cultivating its local authors production of e-books through the service, the notion of stakeholder involvement put forward by Rathi et al. (2017) is yet again of importance to recognize. The dependency on Smashwords to keep an interest in providing the self-publishing service is evident and the author is solely relying on Smashwords, as the public library is not aggregating its own digital resources of information or guidance for independent publishing (Bankhead, 2015). The weakness of this model for providing self-publishing features can be argued in how authors would use the Smashwords service to publish their books according to standards, and unknowingly by the author end up in secluded vendor lists where retailers and libraries would not know of their existence which discouraged authors to use the service (Ibid.).

From a user-centered perspective, the Los Gatos project indicates the importance of providing self-publishing authors with features that go beyond simply throwing them to an authoring service which according to Sandy (2016) could act as a disservice rather than increasing their knowledge and proficiency to independently publish, market and distribute their books.

The other project utilizing both SELF-E and re-branding an authoring service is the Minnesota BookBusters initiative with a strong focus on establishing a creative, local community. BookBusters is giving users the chance to create, market and read self-published works as well as providing librarians with the knowledge of how to offer these services for patrons (Horton et al., 2018). The stakeholder issue of SELF-E has thoroughly been discussed in this environmental scan, and where the BookBusters project is of interest for Publizebra is not the stakeholders, rather it is the front-end design features. The BookBusters website is the latest available service for analysis provided by public libraries, being launched in 2018 and built with wordpress putting it in close proximity to Publizebra in both time and content management system (Horton et al., 2018). Having a reference point for features and layout in the context of self-publishing and wordpress is of value during the iterative design process of Publizebra in motivating design decisions, as BookBusters is lightweight and straight-forward in layout.
B.4 DISCOVERY PHASE - USER NEEDS ASSESSMENT: SELF-PUBLISHING USER NEEDS AND VALUE-ADDING FEATURES

B.4.1 USER NEED: STANDARDIZED QUALITY FOR LIBRARY ACQUISITION

The staggering expansion of self-published books and authors during the last decade has according to DeWild and Jarema (2015) greatly increased the amount of self-published titles being submitted to public libraries. The acceptance of self-published books in collections is however hindered by factors related to the quality of independent works, where Holley (2015) points to poor editorial work, grammatical errors and subpar cover art and illustrations in many of the books that are turned down by public libraries. The notion of quality in this context, is to reflect industry standards of traditional publishing in format, cover art and editing - procedures that authors have shown to be severely lacking in performing and where some are turning to public libraries for gaining more experience (Sandy, 2016). It is worth noting that the Swedish Library act Bibliotekslag 2013:801 states that public library collections shall contain quality media - without any definition of quality. In terms of how self-published books are acquired in Swedish public libraries it is difficult to outline any consistent directives aside from the library act above.

Digital services by public libraries investigated previously in this thesis have acknowledged the standardized quality user need by providing book and e-book production services with a quality standard that will allow for acquisition and distribution in library collections through Smashwords or Pressbooks (SELF-E, 2016; Bankhead, 2015).

DeWild and Jarema (2015) found in a public library setting of Kent County, MI that self-published authors submitting their works to the library for acquisition was turned down due to continuously failing to fill in forms reflecting acquisition standards of public libraries, which included basic information and data about the book, description, high-resolution cover art and author headshot. If libraries were to simply add every self-published book that is submitted to them in their self-publishing initiatives, without emphasizing and supporting the importance of standardized quality, Sandy (2016) argues that it could result in a disservice to authors by keeping them from producing content with full potential.

The Los Gatos Public Library self-publishing initiative in collaboration with Smashwords recognized the importance of not only providing printing and distribution services, but first and foremost give authors the knowledge to professionally prepare, create and publish e-books (Coker, 2013).
B.4.2 VALUE-ADDING FEATURE: CHECKLIST FOR LIBRARY ACQUISITION

The acquisition submission form by DeWild and Jarema (2015) brings up the notion of quality from a broader perspective that relates to the collection-development of public libraries, in that quality is not only aesthetics as it includes adding quality data in procuring an ISBN, catalogue- and metadata such as genre, title, author and descriptive information (Holley, 2015; Sandy, 2016). The lack of self-publishing quality standards for layout, format and describing content is according to Bruno (2015) obstructing librarians from adding self-published works to library collections. For authors seeking to have their e-books acquired by public libraries, assistant cataloger Laura Carruba at Roanoke County Public Library has created an instructional check-list for authors to follow that will make acquiring, cataloging and discovering their self-published work easier for librarians (Carruba, 2014).

The features that Carruba (2014) points out to of importance for authors to understand are summarized below:

1. Always produce front and back title page together with a page about the author and previous books that the author has published. Provide the information of author name, publication location, copyright and print date.

2. Include table of contents for multi-chapter works.

3. Always number pages

4. Provide the back cover with a description of the book without comparing it to other books or media works.

5. Acquire an ISBN number to display a level of professionalism and provide cataloger and online platforms with information about the book and author.


The idea of educating self-published authors of the acquisition policies, expectations and requirements of public libraries for the inclusion of such works has been practiced in multiple self-publishing initiatives, such as LAPL Writes, eBook Self-Publishing Partnership and SELF-E (LAPL.org; Bankhead, 2015; SELF-E, 2016).
B.4.3 USER NEED: SELF-PUBLISHED BOOKS REVIEWED

In the process of collection-development and assisting self-published authors to distribute and market their works, public libraries have expressed the lack of reviews for independent authors (Culley, 2017). Reviews of titles produced by self-published authors is beneficial for increasing the likelihood of being acquired by public libraries as collection development decisions often depend on reviews of books (Culley, 2017; Verrillo, 2017). Having reviews may not only result in recognition by public libraries, it may also serve as a marketing tool for creating an awareness of the book and transmitting success according to Friedman (2015) by creating attention on blogs and social media that may spawn commercial interest from retailers and readers. Sandy (2016) argues that helping authors understand marketing and spreading the book further than relatives and the local library is an important aspect of any self-authoring service provided by public libraries.

B.5 USER NEEDS AND VALUE-ADDI NG FEATURES FOR SELF-PUBLISHING, IDENTIFIED BY AUTHORS AND RESEARCH

For Publizebra to better provide user needs and features supporting independent authors, this section will explore the user needs along with value-adding features of self-publishing brought up in research and by authors.

B.5.1 USER NEED: STANDARDIZED HIGH-QUALITY VISUAL PRODUCT

To generate a book or e-book that is of sufficient quality is an important aspect of publishing indicated by independent authors (Sandy, 2016; DCL, 2016). The fundamental basis for the perception of quality in books emanates from the production standards of traditional publishing houses including a range of value-adding features that self-published authors have shown to be lacking (Thompson, 2012; Matulionyte et al., 2017; Carolan & Evain, 2013). The most predominantly expressed user need for self-publishing found in research is delivering a product with professional visual quality in cover art and standardized dimensions. The importance of a book cover is according to D’Astous et al (2006) similar to that of a product’s packaging in delivering direct information about content and quality. With sites and blogs entirely dedicated to poorly executed cover art of self-publishers such as Kindle Cover Disasters (2018), putting attention to the significance of quality cover art is a crucial task for any service seeking to support self-publishers. The US survey findings of Sandy (2016) point to the issue of cover art, in where 90% of independent authors recognized the importance of creating a quality product, while none specified this to include cover art.
Further, Hviid et al. (2016) identified in an UK study that self-published authors are more inclined to be self-reliant in creating cover art compared to authors familiar with traditional publishing or those switching to traditional from self-publishing. Not only is it public libraries, LIS researchers and publishing industry figures that call for self-publishing authors to provide quality cover art (Carolan & Evain, 2013; DeWild & Jarema, 2015) as successful independent authors further stress the need to blend in with traditional books through delivering a professional product with high visual quality (Alexander, 2017; Rutkowska, 2018; Bolt, 2019). To then encourage self-published authors to apply standardized e-book, hardback and paperback formats and improving cover art quality will according to Carolan and Evain (2013) make self-published books indistinguishable from traditionally published works by readers at first glimpse. The fundamental basis for the perception of quality in books emanates from the production standards of traditional publishing houses including a range of value-adding features that self-published authors have shown to be lacking (Thompson, 2012; Matulionyte et al., 2017; Carolan & Evain, 2013).

**B.5.1.1 VALUE-ADDING FEATURE: PROFESSIONAL COVER ART**

The perhaps most palpable feature is the need to create a book with sufficient visual quality in order to intermix with traditionally published books on the market and not be segregated as vanity publishing (Carolan & Evain, 2013; Alexander, 2017; Rutkowska, 2018). Judging a book by its cover turns out highly relevant for the independent author to recognize, where quality cover art becomes a focal point for self-publishing to overcome during the production of books (Wiman, 2017; Matulionyte et al., 2017). Allocating a part of the book budget to hire a professional designer for cover art and layout while keeping control of the final product is an accepted practice among self-publishing authors, and there are both international and Swedish services available for cover art and design production (Hviid et al., 2016; Matulionyte et al., 2017; Bergström et al., 2017).

To prioritize placing money on outsourcing cover art and layout is stressed by Bowker through selfpublishingauthor.com (2019) and experts such as Friedman (2018) along with best-selling authors Rutkowska (2018). In addition to hiring a designer, Diprose et al. (2017) found through self-publishing a successful coffee-table book, that spending extra on material and visuals of colored end sheets and hard-cover greatly added to the quality feel and making it indistinguishable from traditional published books.
B.5.1.2 VALUE-ADDING FEATURE: BOOK DESIGN TEMPLATES

The need for templates and tools for e-book and printed book creation available with standardized measurements and layout have been advocated by Crawford (2012) and Thompson (2012) to improve the quality of self-published books. Self-publishing services such as Vulkan and Solentro in Sweden provide such tools and templates, yet there is still great responsibility upon the author to create a visually appealing book, as self-publishing services generally do not perform any quality selection or vetting process of books produced through their services, unless the author has paid them for professional design (Vulkanmedia.se, Moulaison & Le Beau, 2015; Matulionyte et al., 2017). Executing the design process without external help will require an increased awareness of industry standards in genre styles, color, typefaces and copyright in use of images (Laquintano, 2010; Carolan & Evain, 2013; Wiman, 2017).

B.5.1.3 VALUE-ADDING FEATURE: TEST PRINT FOR VISUAL QUALITY CONTROL

According to Diprose et al. (2017) self-publishing offers the possibility for authors to counterbalance any lack of skills in producing a quality book by being able to repeatedly test print copies to evaluate and spot aesthetic errors such as color or image calibration until satisfied. In similar fashion Wiman (2017) argues that printing a test copy is an important feature, as it will give the self-published author a feel of the physical product in both cover art and paper quality to avoid mass-printing a book with unsatisfied quality.

B.5.2 USER NEED: HIGH QUALITY CONTENT

The quality of a book is further greatly influenced by less up-front factors of content quality associated with industry standards in editing, description and information about the book (Sandy, 2016; Carolan & Evain, 2013). While the idea of content quality may seem subjective, self-publishing has opened up for niche book markets and specialist subjects that traditional publishers would reject based on content subject (Carolan & Evain, 2013). For self-published authors the importance of content quality is then related to expectations of readers, markets and distribution systems of how the book should be structured, presented and indexed - rather than its subject (Ibid.).

Diprose et al., (2017) exemplifies the importance of understanding content quality for self-published works; having been turned down by traditional publishers due to uncommon duo-language content, the consequently self-published book project found themselves lacking knowledge of content flow, structure and coherence.
B.5.2.1 VALUE-ADDING FEATURE: EDITORIAL WORK

Hviid et al. (2016) found that the effect of bringing in a professional editor was the most significant and highly rated factor for explaining success among self-published authors, and for authors planning to self-publish in the future many expected to hire professional editing services. Bavestock et al. (2015) identified that self-published authors are unfamiliar with editing aspects of book production and would often require additional tutoring when hiring editors. According to best-selling author Bolt (2019) employing an editor may be the difference between a mediocre or best-selling book for self-published authors. Independent editors that are hired by self-published authors can perform an array of editorial tasks ranging from structural work on manuscripts, proofreading, copy-editing, indexing and copywriting (Baverstock et al., 2015). While Bergström et al. (2017) bring up the possibility of choosing between various services and companies in Sweden offering editorial tasks for self-publishing authors, Carolan and Evain (2013) argue that most self-published book projects cannot afford professional editor services.

For authors with a tight budget it is still important to understand the usefulness of editorial features, where Svensson (2017) recommends utilizing help from social networks to increase content quality. Alternative methods for performing editorial tasks are through community driven reader/ writer activities providing feedback and editing help to enable authors to bypass traditional editing services (Laquintano, 2010).

B.5.2.2 VALUE-ADDING FEATURE: ISBN AND METADATA

In traditional publishing procuring an ISBN is an integral part of the production and distribution of books, to create a unique identifier for each book or e-book that will make discoverability in retail and libraries possible (Philips, 2014; Holley, 2015). The importance of an ISBN for self-published works is stressed by both LIS professionals and authors, as it will boost legitimacy of book and author while it is nearly impossible for libraries to find and acquire titles without an ISBN (Carruba, 2014; DeWild & Jarema, 2015; Wiman, 2017). The creation of an ISBN is not registered automatically without action taken by an author or included in a publishing service, and studies by Author Earnings (2015) show an increasing amount of e-books are published without an ISBN identifier. To request an ISBN in Sweden is executed separately for books and e-books through KB free of charge (https://isbn.kb.se/).
In addition to making sure each book contains an uniquely identifiable tag, indexing books through adding descriptive metadata is an important value-adding feature according to Fillmore (2015) as metadata may act as a sole source of truth holding data about author, price, language and ISBN as well as semantic information such as classification, genre and key words that will make discoverability, cataloguing and interoperability online and in databases possible. For books to be searchable, accessible and visible in Sweden, Wiman (2017) along with Svensson (2017) recommends self-publishing authors to register in the publisher-distributor database Bokinfo, where books are indexed with descriptive metadata (Bokinfo.se).

B.6 USER NEED: MARKETING SKILLS

Self-publishing authors has the full responsibility for every step of marketing if not externally contracting it according to Bergström et al. (2017) further showing Swedish self-published authors to be depending on marketing through social media of their e-books - something traditional authors had zero involvement in. Baverstock and Steinitz (2013) found in a survey of UK authors that over two thirds the respondents had extensive involvement in marketing or that substantially more time than was anticipated involved marketing. To understand the need of marketing for self-published authors, the most common features and methods of marketing found in research are listed below.

B.6.1 VALUE-ADDING FEATURE: INDEPENDENT WEB PLATFORMS AND BLOGS

Creating a central hub in the form of a website or blog to form a contact point, portfolio and community around the author is a popular method for self-publishing authors to handle marketing and has proven to be efficient and successful (Skains, 2019; Carolain & Evain, 2013). Establishing a platform dedicated to an author or book is different to just having a profile on popular sites, as getting in front of readers will according to author and librarian Nelson (2015) require being active through blogging and connecting with readers by responding to the community.

To construct an online community is a time-consuming endeavor with the difficulty of reaching out and being discovered among the mass of websites and blogs (Skains, 2019; Svensson, 2017). For a self-publishing author that can dedicate time and effort to a blog or website in an appropriate manner, it is a substantially valuable feature for building reader loyalty, fan bases and testing content through statistics and feedback, while effectively sharing books online (Carolain & Evain, 2013).
B.6.2 VALUE-ADDING FEATURE: SOCIAL MEDIA AND COMMUNITY ENGAGEMENT

Independent authors are according to Sandy (2016) often unaware of how to best conduct marketing, where social media is believed to be the best strategy for marketing. Carolain and Evain (2013) implies that most self-published authors are maintaining a low profile - while pointing to the critical importance to engage with readers in a time-conscious society of media in many different forms that are competing with books. Rather than seeking out traditional review services for marketing of books Cook (2015) argues that social media is something self-publishing authors are increasingly depending on.

Social media can act as a low-cost tool for marketing, interaction and conversation with readers for self-publishing authors according to Philips (2014), where Wiman (2017) further points out the possibility of reaching out to readers without intervention by a third party on a platform that readers are already frequently using. Social media and community-driven platforms such as Facebook or Goodreads enable spaces for special interests to connect, forming niche markets for authors to engage with (Skains, 2019; Laquintano, 2010). Niche markets and communities are according to Carolain and Evain (2013) exceptionally suited for self-published authors’ success as marketing is regarded to be substantially easier for specific audiences.

In order to target and appeal to a community, authors must according to Carolain and Evain (2013) however speak their language, engage and bring substance in knowledge and content rather than blatantly advertising - which may instead negatively impact the author and book as identified by Laquintano (2010) while studying forums and communities dedicated to special interests.
B.7 CONCEPTUAL USER NEEDS AND VALUE-ADDING FEATURES

Below are the identified and common user needs and value-adding features summarized and interpreted as the three conceptual needs of Kotler and Keller (2017). The conceptual needs are intended to simplify the understanding of user needs and help form milestones and user personas to focus development on.

B.7.1 CONCEPTUAL NEEDS OF LIBRARY ACQUISITION

The self-published author

**Stated need:** Author wants to have their book acquired by public libraries.

**Real Need:** The possibility to submit a book to public libraries, to be acquired.

**Unstated need:** Upon acquirement expect the book to be accessible in the collection and loaned by patrons.

The public library

**Stated need:** Library collection developers want high quality self-published books in public library collections.

**Real need:** Require self-published books to fulfil standardized quality and value-adding features in format, ISBN, reviews and description without poor editorial work, grammatical errors and subpar cover art and illustrations.

**Unstated need:** Having authors understand the importance of standardized quality of their works, to not have to turn them down.

B.7.2 CONCEPTUAL NEEDS OF STANDARDIZED QUALITY

**Stated need:** Author wants to publish a book with high quality independently

**Real need:** Needs to know what high quality means, standards and measurements to achieve (cover art, editorial, metadata, copyright)

**Unstated:** Create a book that is indistinguishable from traditionally published works

B.7.3 CONCEPTUAL NEEDS OF MARKETING

**Stated:** Author wants to reach a larger audience of readers.

**Real need:** Author is in need of understanding of how to communicate, share and market the book on social media platforms and on the web.

**Unstated need:** Authors wants to gain a relation with readers.
B.8 CONCLUSION OF USER NEED ASSESSMENT

The user needs of self-publishing authors and books are to an extent reflecting aspects and practices of traditional publishing in production and distribution of titles, albeit from a position where much of the knowledge and practices normally performed by professionals is instead in the hands of authors to acknowledge, execute or plan (Sandy, 2016; Carolan & Evain, 2013). Independent authors unaware of or neglecting the expectations and standards of books and e-books in terms of customary quality along with particular attributes of genres, audiences and communities may risk not only lack of success but ridicule and degrading (Carolan & Evain, 2013; Philips, 2014). In reviewing the literature, various stakeholders of authors, public libraries, researchers and publishing figures call for self-publishers to recognize the above responsibilities, forming a set of user needs of importance for Publizebra to highlight on the platform.
B.9 DISCOVERY PHASE - PROJECT OBJECTIVES

The environmental scan and user need assessment provided insight in design principles, features and user needs of special digital libraries along with particular aspects important for self-publishing authors. The findings of the previous discovery stages along with the predefined strategy and objectives of Publizebra will serve to motivate and prioritize the objectives of development going forward. In order to provide valuable, sustainable information and features for self-published authors, the discovery phase identified three main user needs and associated value-adding features. Following the set strategy of short-term goals, the objective is then to design and implement content and features corresponding to the these identified user needs. The environmental scan identified an issue of sustainability associated with including additional stakeholders in the development of a digital library service, where the initial strategic choices of Publizebra have to be recognized. The fundamental basis for development (aside from a user-centered design) with self-published authors being the main stakeholders, lies in building an accessible, light-weight wordpress based platform that is not dependent on external actors and stakeholders to any greater extent. The content and features to be created for the Publizebra prototype was therefore split in two approaches depending on type of content required for the user need in order to follow strategic choices while making the most of previous research;

1. When the user need is mainly resource based, such as access to standardized e-book templates, cover art or the use of web applications should where possible be proprietarily developed and created by Publizebra and then distributed under creative commons 1.0(0) license and openly available for users - to limit external stakeholder dependency. The digital library will thus not require any registration process for users or maintenance of features by third parties, improving the sustainability and accessibility of the platform.

2. Value-adding features and user needs that cannot effectively be provided as practical resources, instead being knowledge based or informational in nature such as learning concepts of marketing or the importance of performing quality control are distributed as written articles in Swedish. These articles will outline the findings of research in a conventional form of writing and discuss important notions.

3. For the user need of library acquisition the objective is to create Bok-till-Bibliotek and the associated E-Bok-Till-Bibliotek, services for contacting particular public libraries across Sweden where authors must fill in a form to provide information about their book or ebook that is of value for libraries and according to policy standards. Authors are simultaneously informed of what libraries expect out of self-published books, where Publizebra may further help in achieving these expectations.
## B.10 DISCOVERY PHASE - REQUIREMENTS DOCUMENT

<table>
<thead>
<tr>
<th>MUST HAVE</th>
<th>SHOULD HAVE</th>
</tr>
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</table>
| • SEARCH OPTION  
  • CONSISTENT AND CLEAR MENU  
  • HOME BUTTON  |
| **Standardized Quality Features:** |
|  • Cover art Collection  
  • Value-adding design tips article  
  • Quality-control & Editor article  |
| **Marketing features:** |
|  • Distribution article  
  • Social media & Community article  
  • Blogging article  |
| **Library acquisition** |
|  • Checklist of important features for library acquisition of books  |
| **General publishing information** |
|  • ISBN link  |
| **Standardized Quality Features:** |
|  • Copyright information  
  • E-book cover template (word)  
  • Hard-cover book template (word)  
  • Standardized Measurements  |
| **Library acquisition** |
|  • BOK-TILL-BIBLIOTEK application  
  • E-BOK-TILL-BIBLIOTEK application  |
| **General publishing information** |
|  • To-Do List for new authors  |

<table>
<thead>
<tr>
<th>COULD HAVE</th>
<th>WON'T HAVE</th>
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<tbody>
<tr>
<td><strong>Standardized Quality Features:</strong></td>
<td></td>
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<tr>
<td>• ISBN Barcode generator</td>
<td></td>
</tr>
<tr>
<td><strong>General publishing information</strong></td>
<td></td>
</tr>
</tbody>
</table>
|  • ePuB converter  
  • Bokinfo Registration  |
| **Partnering with authoring / publishing services or external stakeholders.**  
  • Blog section to review self-published books.  |

Table 1. Requirements Document of Publizebra (MoSCoW model)
C. INFORMATION ARCHITECTURE

C.1 USER PERSONAS

Based on the environmental scan, user need assessment and conceptual needs of self-publishing authors, three distinct personas were created; one for each major user need identified. For future development, these personas would most likely be expanded into a larger set of diverse users, as the three personas are currently representing a wider spectrum of users within each type of user need, as Still and Crane (2017) suggests to do in the initial stage of prototyping.
## C.1.1 THE LIBRARY ACQUISITION PERSONA

**BENGHT**
- **The Local Author**
- **Demographics**
  - Age: 66
  - Location: Borås
- **Occupation:** Retired Tax Auditor

**Personal Background**
Having retired from work, Bengt has long wanted to write about the history of the local town during the last century, including personal memoirs from growing up there. Bengt has spent a lot of time at the local libraries doing research for his book and writing down stories. Bengt wants to give back to the local libraries and community by having his books acquired by the library and read by patrons.

**Publishing Experience:** Minor publishing experience from his first memoir book.

**Publishing Method:** Online publishing service without extra value-adding features, received help from a younger relative to have his word document uploaded to the publishing service. On the cover of his memoir is a picture of himself that he likes, which was added to a cover template included in the publishing service.

**Use of Social Media:** Has no interest in social media and has not planned to use it for the sake of the book.

### Table 2. User Persona: Library Acquisition

<table>
<thead>
<tr>
<th>USER GOALS</th>
<th>SCENARIO</th>
<th>PUBLIZEBRA GOALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE ABLE TO HAVE HIS BOOK ACQUIRED BY LOCAL LIBRARIES</td>
<td>Bengt has published his first memoir in 30 copies and given to friends and family, he now wants to send it to the local libraries in the region for acquisition. Bengt wants to know how to inform libraries about his book the right way.</td>
<td>Provide an efficient method for directly sending a book to the collection development department of specific public libraries. Inform the user of the importance of policy standards and quality measurements to consider:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Bok-Till-Bibliotek submission form to contact libraries</td>
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<tr>
<td></td>
<td></td>
<td>- Check-list of standardized quality features to learn/acquire</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- ISBN registration</td>
</tr>
<tr>
<td>FOCUS ON ENJOYING THE HOBBY OF WRITING</td>
<td>Bengt values creating a book of high quality, but believes this is achieved in writing. The cover art of his first book was met with confusion as readers did not understand what it was about. For the next story Bengt wants to create a book of the same quality as the books in his own bookshelf. Bengt would be willing to pay a little more the next time for quality details, as long as he does not have to do it himself.</td>
<td>Provide information on the value-adding features and design methods for creating high quality work that can be achieved with the help of professionals and self-publishing service:</td>
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<tr>
<td></td>
<td></td>
<td>- Design &amp; Production Page</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Design Tips Article</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Importance of editorial services Article</td>
</tr>
<tr>
<td>HAVE HIS BOOK READ AND LOANED BY PATRONS</td>
<td>Bengt believes his stories are worth being told in the local community, and thinks that there are patrons who would be interested in the subject and time-period covered by the memoirs and books. As Bengt wants to focus on writing he only wants to be sure that his books are available for local readers.</td>
<td>Inform the importance of description and metadata when submitting works, present it so that the library may easily catalogue and place the book in the right genre, section and key words:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Bok-Till-Bibliotek application to submit book with sufficient metadata and descriptions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Importance of ISBN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Distribution of books and marketing</td>
</tr>
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</table>

*Image of persona downloaded from eleganthemes.com with zero licensing restrictions or attribution required.*
### C.1.2 THE STANDARDIZED QUALITY PERSONA

**ANN-SOFIE**  
The DIY Author  
Demographics  
**Age:** 42  
**Location:** Umeå  
**Occupation:** English Teacher

**Personal Background**  
On the side of work Ann-Sofie likes to blog about writing poems. She is receiving positive feedback of her work and now wants to self-publish her poems in a collection for her followers to read. Ann-Sofie likes to do things on her own and is a fan of DIY (Do It Yourself), she believes she can publish her book independently and is excited to learn how to publish on her own.

**Publishing Experience:** No previous publishing experience.  
**Publishing Method:** Has not yet published any book, wants to understand publishing better before deciding upon using any publishing service or doing it all herself.  
**Use of Social Media:** Frequent user of social media and a long running blog of her poems and short stories.

<table>
<thead>
<tr>
<th>USER GOALS</th>
<th>SCENARIO</th>
<th>PUBLIZEBRA GOALS</th>
</tr>
</thead>
</table>
| BE ABLE TO PUBLISH A POEM COLLECTION ON HER OWN. | Ann-Sofie likes to have complete control when creating her poem collection book, and is interested in tools and information on how to turn her word document into a book and publish it independently. | Provide resources for the production process of books, while informing about what it takes to create a book without giving up control in some areas.  
- ISBN Registration  
- Templates & Standard Measurements  
- Design & Production Page  
- Cover art Collection |
| UNDERSTAND HOW TO CREATE AND PUBLISH A BOOK WITH HIGH QUALITY. | Ann-Sofie believes in creating a book with high quality and is willing to spend time on the required tasks to do so. She is not fully aware of what is needed to properly achieve the quality of books bought in bookshops and online stores, but she is dedicated to learn how to do it. | Provide information on the value-added features of a book and how to independently gain and produce these with a standardized quality wherever it is possible.  
- Design & Production Page  
- Design Tips article  
- Standardized quality  
- Copyright information  
- Quality Control  
- Test Print |
| HAVE HER BOOK AVAILABLE ONLINE FOR FOLLOWERS AND READERS TO PURCHASE | Readers have asked Ann-Sofie if she has published any books of her works, which inspired the creation of a poem collection. Once she has published the book she wants her readers to be able to buy it and make use of her blog for marketing, yet she does not know how to best achieve this. | Provide information on how to distribute books online along with library acquisition. Inform the author on the potential of blogging and how to use it as a marketing tool for self-published books.  
- Distribution Article  
- Link to vendor lists  
- Library Acquisition  
- Marketing Article |

Table 3. User Persona: Standardized Quality. Image of persona downloaded from eleganthemes.com with zero licensing restrictions or attribution required.
# C.1.3 THE MARKETING SKILLS PERSONA

**Margareta**

**Special Interest Author**

- **Demographics**
  - Age: 55
  - Location: Uppsala
  - Occupation: Pharmacist

**Personal Background**

Margareta writes special interest books about Victorian medicine. She has learned how to create an appealing book by paying for value-adding features and producing a book similar to other authors in her special interest genre. Prefers to read and likes being an author on the side while not paying much attention to communities and Facebook groups about her special interest, as she holds a low-key social media profile.

**Publishing Experience:** Has self-published two books in a special interest genre.

**Publishing Method:** Online publishing service in Sweden with editorial and design services paid for (ISBN registration, editorial proof reading and hiring of graphic designer for particular genre-styled cover art and design).

**Use of Social Media:** Rarely uses social media, low key profile and is reluctant to use publicity.

<table>
<thead>
<tr>
<th>USER GOALS</th>
<th>SCENARIO</th>
<th>PUBLIZEBRA GOALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BE ABLE TO REACH A LARGER AUDIENCE OF READERS</strong></td>
<td>Margareta has published two books in a special interest field. Her books are distributed in online bookstores and she has paid for her books to be visually appealing and with proof read content. She now wants to market the book to potential readers in Sweden to gain some revenue from the publishing investment.</td>
<td>Ensure that the investment in value-adding features was a sound thing to do, and guide the author in finding methods for reaching out to readers going forward.</td>
</tr>
</tbody>
</table>

- Potential of Library acquisition
- Point to the importance of reviews
- Point to vendor lists to increase distribution

| UNDERSTAND HOW TO COMMUNICATE, SHARE AND USE SOCIAL MEDIA PLATFORMS FOR MARKETING | Margareta rarely uses Facebook in her daily life, and when she has posted links to her books in groups and pages she found and had been suggested, she received negative feedback and has stopped posting for marketing. | Provide information on the strategies and methods for marketing books and authorship on social media and online communities to avoid misunderstanding use of online platforms. |

- Social media article (understand the dedication, knowledge and respect for social interaction over time)
- Paying for Advertisement as a solution

| GAIN A FOLLOWING AND RELATIONSHIP WITH READERS | Margareta likes to be an author and enjoys publishing books in her special interest field. She wants to find readers that like her books and have a relation with her fans to inspire her before writing more books. She does not know to best achieve this. | Provide information on how it is possible to build a fanbase and platform through blogging or social media. Inform the author of the potential of special interest books as a self-published author. |

- Marketing page
- Blogging article
- Social media article

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*Table 4. User Persona: Marketing Skills. Image of persona downloaded from elegantthemes.com with zero licensing restrictions or attribution required.*
C.2 NETWORK CONCEPTUAL MODEL

Below is a network conceptual model based on the research findings, requirements document and project objectives gathered during the discovery phase, showing the main components content in pages and sub-pages or child elements of user goals with the suggested relations between these (Parush, 2015). The choice of selecting a network conceptual model is due to the structure of the digital library, where users have a high degree of freedom in navigation and interaction flow (Ibid.). Users can at any time access any section of the site from the primary menu, while links and relations between specific pages means the user may deviate or navigate to a destination from more than one specific path, which is essential to a network conceptual model and conceptual navigation principles (Ibid.). The conceptual model below displays how content and features interlink and provides users with multiple routes towards information and value-adding features. According to Parush (2015) the use of a network conceptual model as underlying structure of a website is suited for user needs that are not directly related to a specific workflow, where users may navigate to various sections without a given start or end for a task. For Publizebra, the features and information available on the site is accessible without any particular priority as the user needs of self-publishing authors are not bound to any logical order, with the exception of bok-till-bibliotek application preceded by information needed about library acquisition. The dashed line represents use of external links and while Publizebra is recognizing the use of external stakeholders for these value-adding and informative features, they were deemed beneficial for end-users. Dotted line represents internal links between pages to guide users towards articles and value-adding features related to their initial user goal.

Figure 2. Network Conceptual Model of the Publizebra Prototype.
C.3 MEDIUM-FIDELITY WIREFRAMES

Based on the network conceptual network model and established principles for interaction design and visual design in this project along with inspiration from projects researched during the discovery phase, four medium-fidelity wireframe models were created reflecting the different page templates and features of the digital library. The wireframes were created with a commonly used resolution of 1366x768 pixels as design model and can be found in Appendix 6.
D. INTERACTION AND VISUAL DESIGN

Moving from information architecture to prototyping, the visual and interaction design principles were reasoned for and applied to the high-fidelity prototype, all elements in the visual profile can be found in Appendix 7.

D.1. ICONS

The use of icons on the prototype utilized recognizable depictions of commonly used concepts within web design where possible, such as searching, sharing, check-marks and social media (Krug, 2014). The more contextual icons used related to self-publishing were applied with two design principles; to always put icons in relation to text to clearly state the meaning and relationship of these as suggested by Goodwin (2009). Secondly, icons are kept simple with low detail count, with varying forms and no filled circles surrounding as this would make icons less distinguishable and more difficult to read (Goodwin, 2009).

D.2 IMPLEMENTATION OF VISUAL DESIGN PRINCIPLES

Central to practically applying the visual design principles upon the prototype product is the notion of reasoning for every design decision and argumenting for the purpose of elements as stressed by both Goodwin (2009) and Krug (2014). Following the fundamental principle of understanding the practicality of elements, features and visuals placed on the site is essential in order to avoid unnecessary implementations and design decisions as put by Krug (2015. This section presents the practical implementation of visual design principles as outlined in the design methodology.
D.2.1 USE OF AFFORDANCES

To hint at and provide visual cues for interaction and further reading is consistently applied across the prototype, where gradients play a central role in highlighting clickable actions and features as suggested by Goodwin (2009). Buttons make significant use of gradients as seen on the primary buttons as well as unique buttons (Table 5), in the case of secondary buttons where no foreground gradient is applied there is instead use of a gradient backdrop. Additionally, links and features are highlighted with the use of warm or contrasting colors when occurring in text or paragraphs.

D.2.2 VISUAL HIERARCHY

Having a close connection to the use of affordances, visual hierarchies played an important role in emphasizing content and features for the prototype. The main strategy for creating a visual hierarchy is in the use of headers, sizing, boxing of content and text, placement and clear cut-off points between sections within pages to create a set order (Krug, 2014). The top placed header of each page is large and contrasting in color to the backdrop in order to introduce visitor to the page subject. Following sections of each page has a contrasting backdrop to the section prior, where use of content boxes with shadowed frames and contrasting colors are used.

The notion of placing crucial information in larger text size and supporting text in lesser sizing as proposed by Goodwin (2009) is applied across the site. Examples of visual hierarchy can be seen on figures E.2 and E.6 in the following chapter.

D.2.3 RECURRENCE OF ELEMENTS FOR UNITY

Consistency across pages is attempted through repeated use of colors, icons and structure across the various types of pages to reduce contrasting appearance navigating across the site (Goodwin, 2009). To diverge from the coherent design in order to create a spark of energy and make particular features, elements and pages stand out from the rest as practiced by visual experts according to Goodwin (2009), unique buttons (Table 5) are applied where special actions are available for the user. The major exception from the visual unity is the library acquisition segment from introduction page to bok-till-bibliotek application, where unique buttons, backdrop and structure is used (E.4, E.5).
D.2.4 READABILITY AND SIMPLICITY

Across the site, text alignment is left-oriented and content follows left-reading alignment and order standards to improve readability and the simplicity for the perceived users (Goodwin, 2009). The selected sans serif typeface of Abel for paragraphs exists within the Google Fonts API and is regarded to work well for smaller text sizes on the web. (https://fonts.google.com/specimen/Abel). The use of bulleted lists as promoted by Krug (2014) is applied on longer paragraphs and where listing, summarizing or linking of features and information is occurring (Figure E.3, E.6).

D.2.5 INSPIRATION IN DESIGN LANGUAGE

During the discovery phase of self-publishing services provided by libraries, Publizebra gained both visual and interaction design inspiration from other projects. The website MNwritesMNreads.org of the BookBusters (2018) project provided inspiration in its simple design and use of icons to present its three features of Create, Share and Read. The three icons, three features design is reproduced on the Publizebra platform for each main category page of Design & Production, Marketing and Library Acquisition as seen on figure E.2 and E.4.

D.3 IMPLEMENTATION OF INTERACTION DESIGN PRINCIPLES

D.3.1 MAKE USE OF CONVENTIONS

Established interaction design conventions in the context of web sites as laid out by Krug (2014) are applied to the Publizebra prototype by always providing both search and home button, while further locating the logo in the top left corner.

D.3.2 BREAKING UP PAGES

To break up pages in clear sections in order to form structure and order has previously been attributed to the use of visual hierarchies and is important for interaction design according to Krug (2014). To further improve upon separation of sections within pages, the menu structure of Publizebra is designed according to a model by Krug (2014). The relationships between content becomes more apparent by having a primary menu with category-based drop-down alternatives and a separated top secondary menu above the header of each content page to highlight and quickly navigate to the different sections (Ibid.). Figure E.3 exemplifies breaking up of pages in both menu structure and visual hierarchy.
D.3.3 SCANNABLE CONTENT

The content on Publizebra is designed with the possibility of scanning through content with the help of clear and describing headers to scroll and select in the way Krug (2014) suggests. When interacting with pages on the prototype, users are not forced to read through longer segments of text without having headers and alternative options available in close proximity to scan and identify elements that may be of interest based on headers or eye-catching content. The cover art gallery page (Figure E.6) exemplifies the use of scannable content by providing both informative headers and the immediate browsing of cover art images.

D.3.4 PERSISTENT NAVIGATION

Extending upon the visual hierarchy and consistency of visual design, the persistent navigation principle by Krug (2014) is applied across the prototype through the use of a static left-side primary menu with logo and fixed secondary menu on content pages. To ensure users that they are navigating across the same site and not being sent elsewhere, the placement of menus and top headers are consistently placed to give a sense of seamless navigation from page to page.

The exception to the rule of persistent navigation in order to invoke a distinction and change in activity and most suitable for the use of forms as implied by Krug (2014) is the library acquisition and bok-till-bibliotek application pages (Figure E.4, E.5). The page menu, background and structure are different from the remaining site in order to provide full attention to the step-by-step action that is required to learn, select and submit.

D.3.5 NOT GETTING LOST IN SPACE

Home button, highlighted text on the primary menu and the an underlined and blue-lit secondary menu bar indicating which page and content section the user is currently visiting was designed to improve the interaction design of the prototype as outline by Krug (2014). Users navigating the prototype will always have the option to return and start from the home page, while further being able to know their current location on the page as exemplified on figure E.3 by indicating that the user is visiting the design tips section of the design & production page.
D.3.6 HOME PAGE CONTENT

The home page of Publizebra follows interaction design principles by Goodwin (2009) in addition to Krug (2014) in order to make finding of information and features easier. The key objective for the landing page is that different types of users will find information and direction towards particular user needs without having to create a set of home pages tailored towards the user, that would require use of cookies or registration.

The mission and site identity of the service is communicated as seen on figure E.1 through the introducing top header, indicating where to start reading along with listing of features and categories available below in order for users to identify if the site is of interest for their user needs (Krug, 2014).

The middle section of the home page of library acquisition functions as a tease element to imply the possibility of being acquired by libraries and to invite users to dig further into the site. The wide range of alternatives available on the home page from ISBN registration to articles and resources is designed according to the principle by Krug (2014) to expose users to aspects of the service that may not have been the visitors’ main user goal, yet turn out be of usefulness. Promoting the content available within the service is achieved through the bottom section of latest articles (Figure E.1), with the possibility of being actively updated and dynamic in its selection of content without changing the layout or overall structure of the page.
E. PROTOTYPING

Below are screenshots of the prototype once visual and interaction design principles were implemented and the functionality of features and content reached high-fidelity, by being able to access and interact with all pages on the live prototype. Prior to evaluation of the service, any iterative design changes or tweaks were freezeed and not allowed as proposed by Still & Crane (2017). Hence the prototype images all represent an identical iteration of the site as they would interact when browsing.
E.1 PROTOTYPE HOME PAGE

Figure E.1. Landing page displaying interaction design principles by Krug (2014) in site identity and mission, top header for starting point, tease element in library acquisition (din bok på bibliotek) and latest articles for content previews. One single home page containing different user needs and selection of features to cater for a broad range of visitors as promoted by Goodwin (2009).
Figure E.2. Displaying the Design & Production main content page with links to the particular sections of the category. The visual design principle of visual hierarchy is exemplified with the use of different sizing of elements, contrasting colors between segments and gradient foreground and backdrop on buttons and background, along with the three shadowed content boxes to separate features (Goodwin, 2009).
E.3 PROTOTYPE USER GOAL PAGE (SUB-PAGE)

Figure E.3. Design tips section displaying use of bulleted lists to improve visual readability of paragraphs and highlighting links (Krug, 2014). Content on the page is segmented through the use of visual hierarchy in color and placement of text in boxed layout, where the visual resources associated with highly independent self-publishing is put in direct relation to the relevant text. The bottom segment is designed to contrast the remaining page in order to break up consistency and indicate a change in content, directing to a new page of quality control. The main menu highlights Design & Production and the secondary menu indicates the current page of design tips to further break up content into dedicated pages, and to improve navigation by informing the visitor of the current position on the overall page as proposed by Krug (2014).
The page introducing the notion of library acquisition is designed to break the repetition of design elements and aesthetics, with unique buttons, background and relaxed structure to indicate the use of special features and actions (Goodwin, 2009). The lack of secondary menu and change in design is an interaction design strategy to break persistent navigation and make users aware of a change and focus on the particular content (Krug, 2014).
Figure E.5. The library acquisition application prototype containing the region selector and form following the interaction design principle of removing persistent navigation and unity of elements across the site, with unique buttons, header, background, content boxes and no secondary menu (Krug, 2014).
Figure E.6. The cover art collection holding public domain cover art images and illustrations along with textual information. The page displays the interaction design principle of scannable content as put by Krug (2014) through the use of descriptive headers of cover art and copyright or the choice of direct access to images and scrolling. Visual Hierarchy is applied in the use of warm colors for links, shadowed boxes separating image and text and change of size in cover art to allow for focusing only on images by scrolling down (Ibid.).
F. PERFORMING THE HEURISTIC EVALUATION

The heuristic evaluation was performed by the expert evaluator from SSLIS, Borås in April of 2019 on the live prototype at publizebra.se following Nielsen’s ten heuristics. The evaluation returned valuable feedback for the development and is summarized in this section to highlight where the Publizebra prototype showed both strengths and weaknesses. The full heuristic evaluation form can be found in Appendix 1.

F.1 RESULTS OF THE HEURISTIC EVALUATION

The evaluator believed that the initial heuristic of visibility of system status as put by Nielsen and Molich (1990) in order to keep users informed about what is going on, was achieved by being quite well informed of where the evaluator was. In terms of matching between the system and real world by speaking in the language of users through wording and avoiding system-oriented terms, the expert evaluator found the language easy to understand even though not being a native Swedish speaker. Consistency and standards for the user to follow where wording, pages and actions are consistent across the service was found to be true without any note of inconsistency. During the evaluation of user control and prevention of errors, the structure of the heuristic evaluation form being a slide-in function caused slight confusion due to turning the mouse cursor into a cross associated with cancelling activities. The evaluator realized this had to do with the heuristic form rather than the functionality of the site, and could deem the website to allow for user freedom and control without any remarks.

Error prevention by avoiding error messages and problems to occur was believed to be executed in a good way, where the only problem was in fully understanding the functionality of the heuristic form. Minimizing the memory load of users through making actions, options and objects visible without having users extensively remember aspects from one section to another without any instructions available as outlined by Nielsen and Molich (1990) was achieved, as the evaluator implied there was zero memory load on the site.
Providing a service with flexibility and efficiency of use is according to Nielsen and Molich (1990) a design towards both inexperienced users and experienced users resulting in a site that is catering towards a wide range of users while allowing for speeding up use. The expert evaluator deemed the site efficient to use with the prerequisite of needing some time to understand the purpose of the site and how to personally make use of it. Creating minimalistic and aesthetic design that is not cluttered by irrelevant information or infrequently used, causing relevant objects and information to diminish is to be avoided (Ibid.). In the context of Publizebra the design received important points of critique in sizing of elements, where the landing header (as seen on figure E.1) was believed to be intimidating and overwhelming along with the scale of buttons being too big. The proportion of the latest article section at the bottom of the landing page was recommended to be slimmed down by 30% in order to reach a minimal design.

Avoiding coded error messages and helping users to recognize and recover from errors through expressions in plain language along with solutions, was deemed to be well done. Additionally, the evaluator found no situation where help was needed or requirement of any documentation to use or navigate the site. The evaluator was asked to provide open ended additional comments to the heuristic evaluation, where the problem of element sizing was brought up as most critical. While the site was deemed to be logical and neatly designed while holding good architecture, the expert evaluator expressed that elements felt as if they were designed for visually impaired individuals due to the scale of buttons, headers and elements.
F.2 CONCLUSION OF THE HEURISTIC EVALUATION

The perception of buttons and headers being intimidating and dominating as communicated by the heuristic evaluator, wishing that these areas would be smaller is critical to recognize. The imbalance of elements deviates from the idea of aesthetic and minimal design to follow user-centered design principles and improve user interaction. Publizebra did not hold a prioritization towards visually impaired in its design strategy, and thus such points (while positive for visually impaired perhaps) should be regarded as unnecessary or diminishing the purpose of the design. The suggestion of scaling down elements roughly 30% to make it less overwhelming is a valuable insight in the design and overall functionality of Publizebra. Being provided concrete propositions to solve the expressed problems identified in the heuristic evaluation, while predominantly receiving positive feedback and great functionality outside the area of design gives the development of Publizebra a firm vision of where to focus improvement and implementing possible solutions before proceeding to the expert evaluation. Lastly one may bring up the circumstance of Publizebra being in Swedish while the expert evaluator is a non-native speaker in the language, which could be a point of critique in terms of answerability to the evaluation of match between system and real world in use. Although the heuristic evaluator personally acknowledged the non-native issue while being uncertain of its implications to the evaluation, one must recognize that the language was still deemed easy to understand.

To minimize the risk of creating a language without real world use, this particular heuristic was set to be included in the expert evaluation to have additional evaluation of the language. The confusion caused by the slide-in evaluation form, which seemingly had an impact on analysis of user control and error prevention heuristics gave insight in the use of slide-in forms. In order to reduce the risk of confusion and loss of data, it was decided to cancel the use of a slide-in feedback form on site for the coming expert evaluation and instead have these provide additional comments in a dedicated usability form and design review.
F.3 IMPLEMENTATIONS FOLLOWING THE HEURISTIC EVALUATION

The digital library prototype received partial re-design of elements, text and buttons that were deemed too big during the heuristic evaluation. The entire site was reviewed and re-assessed for any objects that were disproportionate in scale compared to other content on the page, and a general rule for buttons and headers was applied through reducing size by 30%. Standard sizing for buttons then became 16pt, and all headers were set to a default sizing value which had previously been unevenly increased across the site. The latest article grid at the bottom of the landing page was further scaled down as suggested by the heuristic evaluation, while the title text was reduced and the margins of the content was increased to proportionally balance the design and make it less overwhelming. No changes were made to the information architecture of links, relations and language of the site as these aspects successfully passed the ten heuristics.
G. EXPERT EVALUATION – TESTING THE PROTOTYPE

The expert evaluation through testing of the prototype was performed online by the participating lecturers from SSLIS, Borås during April and May of 2019. In order to present the findings of the expert evaluation, the pre-established test plan for the usability testing and design review constituting the evaluation is laid out below.

G.1 EVALUATION TEST PLAN

The expert evaluation of Publizebra was designed to have participants perform realistic tasks that are associated with user needs and features of the digital library, to test and review the prototype. Having users navigate, interact and explore the service was of interest to measure the functionality by identifying possible usability deficiencies along with critical errors (Rubin & Chisnell, 2008).

Conducting an additional evaluation and testing of the prototype was of great importance in order to identify particular elements, objects and tasks that the evaluators find to be broken or difficult to understand. The findings would have to be studied further prior to a product launch and future test iterations of Publizebra. The research questions of the expert evaluation are as follows:

1. How easily do experts find the features or information they are looking for?

2. What obstacles are encountered on the way to finalizing the tasks?

3. What is the opinion of the participants about the usage of the digital library?
G.1.1 EVALUATION DESIGN METHOD

The usability evaluation holds an explorative approach by gathering information on usability and functionality related to the understanding and perception of high-level concepts of the digital library. Due to the relatively untested content and features of the discovered user needs developed for the prototype, the selection of an explorative study of qualitative feedback from the experts was prioritized. To seek out the impression, opinion and understanding of the service functionality and usability relates to the second main research question of this thesis in how value-adding features and user needs may be aggregated in a special digital library service.

The usability study focused on testing the accessibility and interaction, along with if features and information available through the digital library were fundamentally understood by the experts. The explorative approach thus attempts to make sure that the high-level concepts of design, production, marketing and library acquisition embedded in visual and interaction design principles are decipherable and usable.

Each participating evaluator was faced with a different order of tasks to counterbalance the issue of learning transfer, caused by performing tasks in a set and identical order for every user where any transfer of learning effects risks being applied to every test session (Rubin & Chisnell, 2008). Giving the participants a unique task sequence, transfer effects are reduced, and the three evaluators may have a balanced testing of the tasks by all coming from different prior task sequences (Ibid.). In the case of Publizebra the use of counterbalancing was further of interest as the user needs and features available on the site does not require any particular order or prioritization.

The expert evaluator was introduced to the online testing and evaluation session through a short explanation of the Publizebra service as proposed by Kruger (2014). The evaluator was then informed and asked for consent of recording the analytical data through Hotjar when visiting the website, without storing any personal information. Once briefed of the service, the evaluator was free to proceed to the first task. The task was presented prior to entering the site, where the expert was asked to return to the form once the task was believed to be completed. The form then introduced a set of open-ended or nominal questions before the next task was provided and repeated in the same manner.

Once all three tasks were completed and with the usability testing section finished, the participant was given a design review of questions related to their impression and use of the digital library prototype. Additionally, the expert was asked to grade in ordinal scale the interaction and usability of the site based on visual and interaction design principles (Appendix 3).
G.1.1a TASK A
Starting from the home page; You have a self-published book you wish to suggest for acquisition into a public library collection in Stockholm, find a method for doing so.

G.1.1b TASK B
Starting from the home page; You have self-published a book and wish to learn more about marketing, find information on at least one way of reaching out to readers.

G.1.1c TASK C
Starting from the home page; Browse around the digital library as you like and stop when you feel familiar with the site or exit when you have found something that you deem interesting or valuable.

G.1.2 SUCCESSFUL COMPLETION CRITERIA
Following the principles of Rubin and Chisnell (2008) successful completion criteria (SSC) was defined for each task. Based on the feedback of evaluators in finding information and features to be easy or difficult, together with their reasoning, the tasks will be regarded as successfully completed or not completed.

G.1.3 TASK AND QUESTION SEQUENCE BY EXPERT EVALUATOR
Evaluator 1: A, B, C
Evaluator 2: B, C, A
Evaluator 3: C, A, B

G.1.4 EVALUATION AND TEST ENVIRONMENT, EQUIPMENT AND LOGISTICS
The evaluation sessions were performed online with instructions through Google forms without any time limits, the participating evaluators were asked to perform the tasks using a laptop or desktop computer. The experts provided qualitative preference data through answering explorative questions in a self-reporting approach, suitable for the type of evaluation (Rubin & Chisnell, 2008). In the event of an expert failing or finding critical errors that would make completing the task impossible, the interactions of each test session was recorded through the analytical tool Hotjar (Hotjar.com). Tasks or sections of the site that could not be completed or reached by the expert, making evaluation difficult due to low-level interaction issues and technical problems such as broken links, buttons or missing content could then be identified and analyzed based on the recorded sessions on site (Rubin & Chisnell, 2008).
G.1.5 MODERATOR ROLE

The role of the moderator was held to a minimum to reduce interference and interaction with the self-reporting expert, as the evaluation involved learning and interacting with the site along with different concepts and features, in order to navigate and perform specific tasks. Rubin and Chisnell (2008) suggests minimizing the moderator role where usability of the prototype holds a greater emphasis than the ongoing thought process of participants. The test plan for Publizebra followed a minor moderator role by limiting it to help requested through phone or email, while acknowledging that users could want to express their thought process, the option thus existed to do so in the form.

G.1.6 PREFERENCE DATA

The experts provided preference data through a combination of nominal answers to tasks, open ended commentary along with reasoning for how tasks had been completed efficiently or inefficiently. The questions posed following tasks, were designed to gain qualitative insight to the analysis of the prototype. Further, the usability evaluation sought to collect information on strengths and weaknesses that participants had personally identified. The combined data on both their subjective opinion about the service and their design review of overall ordinal scale rating of usability and interaction aspects sought to answer the final expert evaluation research question. The heavy focus on preference data and identifying critical design errors meant that performance data such as completion speed between experts or tasks was not assessed in the research questions. The reason for not putting any striking attention to summative data at this stage when utilizing experts, relates to the notion of creating a high-fidelity prototype based on expert evaluation, where performance data is then to be quantified from real-world end-users.

G.2 EXPERT EVALUATION RESULTS

The outcome of the three expert evaluations are summarized and described below. Due to the different task sequences, each evaluation is initially presented separately in order of task performed to preserve the evaluation process of each expert. The full scripts of the evaluation sessions of usability testing by experts and design review are found in Appendix 2 and 3.

G.2.1 TEST AND REVIEW - EXPERT EVALUATOR 1

Performing the first task of library acquisition, the evaluator found it easy to identify with the logical library acquisition alternative of the main menu to the left, followed by the call to action header to use the bok-till-bibliotek application. The evaluator however pointed out that the header link does not identify itself as to be a clickable link, as it is not underlined or accentuated. Additionally, information on what libraries seek of self-published books was found and believed to clearly state what is required on the library acquisition page.
To find information about marketing and methods was believed to be easy, following the same reasoning as the first task. Through exploring the digital library and its features, the evaluator not only identified ways to increase the quality of books in production and design, as the participant found the prototype to have a clear menu with sufficient and decent content. However, the fact that content could be reached through an array of different menus’ and alternatives on the site was regarded as slightly confusing.

The expert evaluator identified an error in the prototype design where two different icons were used for the concept of quality control. The two icons caused confusion to the content as the evaluator found them to indicate different concepts, where the secondary menu icon of a magnifier hovering above text was preferred over pen in a checkbox. The overall impression of the site was positive, where the strength of Publizebra was the information contained on the site that was believed to be valuable and easily accessible. The main weakness of the prototype was the confusion caused by having the same content and information accessible through different menu alternatives across the site. The expert evaluator suggested to reduce the amount of alternative paths to access the same information.

G.2.2 TEST AND REVIEW - EXPERT EVALUATOR 2

The evaluator started off with finding information or a method of reaching out to readers, which was believed to be easy. The motivation behind the intuitiveness being large and clear menus displaying where more information could be found. Further, the expert added that the absence of any distracting elements such as image or news sliders taking up space, resulted in an easy path to finding information.

Upon asked what the user experienced as interesting or of value to mention following the exploration section, the participant articulated three points. The first practical point being the many different paths to reaching the three main areas of marketing, design, production and library acquisition. Secondly the evaluator found that there was important information that was easy to miss due to its placement on the footer, further down on pages. Additionally, the participant felt that the bok-till-bibliotek application was not properly functioning due to the limitation of Stockholm. To motivate the easiness of performing the final task of library acquisition, was that one had previously explored the page, making it easier to find. The evaluator attempted to briefly look for requirements or policies of libraries on the page without any luck, pointing out that one may then have to look for such information on other places with a high risk of abandoning the Publizebra site.

The expert evaluator found the site to have a continuous design that was not overwhelming. Additionally, the site had a harmonic mix of colours and clear use of icons. The impression of using Publizebra was that it is uncomplicated and easy to navigate, which was indicated to be a major strength of the overall site. However, the participant pointed out that the service may be perceived as less reliable due to the lack of any section with information about Publizebra itself, additionally the typeface was experienced to be unpleasant for reading.
The most striking deficiency was the placement of the resource menu only available in the footer rather than somewhere else, as this information was regarded as an important part of the site by the expert. Three suggestions for improving Publizebra were given; To change the typeface, add contact information and an about us section, and lastly to have better clustering of information.

**G.2.3 TEST AND REVIEW - EXPERT EVALUATOR 3**

Upon finishing freely exploring the Publizebra site the digital library was found to be an interesting idea and the evaluator enjoyed browsing the cover art collection. If there was anything confusing or distracting identified during the task, the impression was that the presentation of what the service is about and whom the target audience is, was unclear. The expert believed that the service should clearly state the value of the service for an intended audience. The evaluator believed it was unclear if the site was supposed to contain everything that is needed for publishing a book, or targeted towards a particular audience, where elements of the site such as the reminder to always include numbering of pages felt obvious and unclear to whom it would serve.

The expert found it easy to find a method of reaching out to libraries in Stockholm, with the motivation that there are clear links to the bok-till-bibliotek function, easy to navigate and find. The evaluator retrieved information about what libraries want and the requirements from self-published books, as there existed information on the subject. However, the information provided was deemed to not be fully realistic to its purpose; rather that it mainly only focused on the aspects that Publizebra provided. The final task was believed to be easy, as the section of marketing is one of only four main menu options.

The design was deemed as fairly well executed, however with the impression that the site felt slightly generic for the expert’s taste. The evaluator provided additional feedback on the actual service as a concept and the uncertainty of any target audience. The expert evaluator expressed hesitance about the service and its perceived purpose, that was believed to be to help individuals wanting to write books without any knowledge of authoring; being uneasy with this concept. The idea of providing all the important knowledge and information about publishing books in one place was believed to be the main strength in theory, however it was something that Publizebra was not fully achieving in its current state due to obvious advice and only focusing on the features available on the site.

The major weakness of the service was the uncertain market, target audience and the lackluster advice. Looking at the points of doubt concerning the lack of any presentation of the service on the web site, the expert further believed that the service would benefit from a more professional appearance and contain more valuable features for the intended audience. The third participating evaluator did not believe that there is a great interest among the public to publish and write their own books, and that Publizebra would not attract serious authors. The bok-till-bibliotek function of having books acquired by specific libraries, was believed to be not of primary interest for authors, additionally the evaluator had doubts about the future role of printed books within the future of libraries.
G.3 ANALYSIS OF EXPERT EVALUATION

G.3.1 EASE OF FINDING FEATURES AND INFORMATION

In order to understand the level of ease to find features and access information for the experts, it is of interest to break down the objectives of the tasks to see how their reasoning and feedback can provide insight in how tasks were completed and perceived. The main task objectives of finding particular information or features on the site were successfully completed by each participating evaluator, where all three believed it was indeed easy to find what they were looking for. The most common path to reaching information and features was articulated and to be through the use of the main menu, believed and seen to be a clear way of navigating.

The ease of finding information was further motivated by the clearness of page content, and no expert evaluator found the language used to be overly technical, or difficult to understand. Additionally, one evaluator believed that the site displayed clearly and logically where further information of subjects could be found, without any distracting elements or content that would stray the user from the path of finding the right information. Further, having explored and familiarized with the site had an impact on navigating and finding information. This was demonstrated in how one evaluator simply repeated relying on utilizing the main menu for each task following the first, while the exploration session made navigation between tasks seamless for another expert.

While each main task was successfully completed and regarded as easy, the evaluators were given follow-up questions concerning their recollection of value-adding information for self-publishing, that was available on the various pages being visited. Finding or learning such information was not as clear, where only one had learned during exploration about increasing the quality of a book through production and design.

Information of what libraries want from self-published books in order to increase the chance of being acquired, available on the library acquisition page and next to the application form was found by two experts. These individuals did however perceive the information very differently, where one found the information to be clearly stated on the library acquisition page, the same information and criteria was believed by the other to be unrealistic in the context and only reflect features of Publizebra. The evaluator that did not find any information on the subject pointed out the critical issue of leaving the site and searching for such information elsewhere. The feedback from the latter two evaluators display a weakness in how Publizebra is providing a particular information section. It was found both insufficient and non-existent, where it was supposed to be easy to find and beneficial for the user. The ease of finding information was further believed to be flawed by the fact that some information perceived as important was only available on the footer or further down on pages, such as resources of book templates and measurements.
G.3.2 OBSTACLES AND ERRORS

During the testing of tasks, no critical errors or obstacles forced the participating experts to fail or quit finalizing of any of the given tasks. The perceived errors and obstacles were minor and related to the information architecture and design of the prototype, which mainly caused confusion. The most striking obstacle while using and navigating the site was expressed separately by two individuals, in the many different options available across the site for reaching the same content section from main menu, headers and secondary menu. Having the same information accessible from multiple alternatives on a single page made it unclear if the content browsed really belonged on that page or somewhere else given the many options.

The ordinal rating during the design review of navigation between pages as confusing or easy was further the lowest rated part of usability and interaction, being regarded as the major weakness of the site by one evaluator. The other expert that pointed out the many paths for reaching content was also the one indicating the placement of some important information only in areas perceived as difficult to reach. The difficulty of reaching content caused a contrast between the many options to access some content, and the limited access to other.

Visually the task sessions identified a set of errors, where the header link to the bok-till-bibliotek application on the acquisition page was pointed out to lack any sort of indication of being an interactive element. While the call-to-action buttons to the application are directly below the header, the alternative method for reaching it is not following the principle of affordances to indicate what is clickable (Krug, 2014). Further adding to the confusion of multiple paths to content was caused by the use of two distinctive icons to represent the concept of quality control. As these icons were perceived as drastically different, only one of them represented the concept efficiently. For one evaluator the typeface of the site turned out to be a major obstacle, as the small size and lack of thickness made reading both unpleasant and difficult for longer series of text. Being an information-heavy site, having reading become an obstacle for users is critical to avoid.

G.3.3 IMPRESSIONS OF USING THE DIGITAL LIBRARY

The feedback and impression provided by the participating evaluators covers a wide range of aspects highlighting both positive sides of Publizebra and pinpointing where the prototype fell short. The major strengths of the digital library were expressed to be its simplicity of accessibility and interaction by two experts, followed by the actual information provided on the site. While one participant with a positive impression of visiting Publizebra considered the information to be beneficial and accessible, another one found the information to be largely self-explanatory and thus not of use for any wider audience. The visual design of the site did not receive any major points of criticism during the design review, where no evaluator expressed any pivotal weakness in it that affected their overall impression.
The visual design was seen as continuous with use of harmonizing colours on one end, and slightly too standard on the other. Setting aside the impressions of visual design and interaction design, two of the usability evaluators pointed to problems of trust, professionalism and reliability caused by a lack of introduction and presentation of the service. The prototype does not contain an about us page or a dedicated section covering what Publizebra is about, which was suggested in order to improve the site. It was believed that due to the absence of information about Publizebra, it becomes unclear not only what the service is about but for whom it is targeted towards specifically.

Further, the lack of a proper introduction was believed to result in missing an opportunity of pointing out the actual value of the service for its audience. For one of the experts it had an effect on understanding the whole concept of the prototype as shallow and only relevant for individuals with zero knowledge of writing or authoring. Looking at the project objectives, user personas and information architecture of Publizebra the intended use is far from only providing what the evaluator perceived. The analysis concludes it to be a serious failure of the Publizebra prototype to not succeed in introducing the wide use of features and information intended for different types of users.

**G.4 CONCLUSION OF EXPERT EVALUATION RESULTS**

The testing of usability and reviewing of design included in the evaluation provided the development of a user-centered special digital library with valuable, interesting and crucial information to improve and re-design the service. The feedback and completion of tasks confirmed the functionality of various implemented principles related to both visual and interaction design, while pointing out issues and errors that had not been identified during wireframing, prototyping nor heuristic evaluation.

Finding information and features of the given tasks was considered easy through the use of the main menu and headers. Information related to value-adding features of self-publishing were found to be straightforward, self-evident or not found at all. The main obstacles of the prototype related to confusion caused by an abundance of alternative entry points to the same content, and the use of a typeface that was unpleasant to read in smaller sizes. Throughout using the digital library, the expert evaluators articulated both positive and hesitant opinions about the service in liking its simplicity, accessibility and cover art gallery. Hesitancy was caused by the lack of any significant introduction to the value and purpose of the digital library service.
7. DISCUSSION

The thesis sought to develop a prototype special digital library for self-publishing authors in Sweden. The motivation to create Publizebra.se was based on the lack of such a service, the relatively few self-publishing services and the presumed difficulties with self-publishing caused by not having access to the value-adding features and user needs that may help independent authors to succeed (Bergström et al. 2017; Carolan & Evain, 2013). In order for the service to provide user needs and value adding features of self-publishing authors, these needs and features had to be fundamentally established and understood through research and development. The goal of developing a prototype with a user-centered design approach would then require applied research of visual and interaction design principles and methodologies to practically create a prototype, while implementing identified user needs and value-adding features in line with the design principles. The notion of a user-centered digital library for independent authors thus entailed a mix of fundamental and applied research, examining self-publishing, its use and relation to digital libraries along with the development process of special digital libraries. The two main research questions sought to outline the fundamental user needs and value-adding features, while identifying the available and conceivable methods for providing and aggregating them in a digital library setting.

1. What are the user needs and value-adding features for self-published books and authors identified by public libraries, authors and research?

2. How may value-adding features and user needs be aggregated in a special digital library service to distribute information, resources and guidance for the benefit of self-publishing authors?

The design process of Publizebra.se consisted of multiple stages of research and iterative development in order to form a special digital library, where the research questions effectively sought to be answered and demonstrated during research, development and in the final prototype. Therefore, the closing discussion will focus on how the various stages, methodologies and research contributed to the goals, objectives and research questions of the thesis. Additionally, the functionality and validity for development of each stage of the prototyping process is critically evaluated and discussed based on the outcome and intended purpose for development and user-centered design.
7.1 THE STRATEGY

The strategic plan of Publizebra was formulated to sustain a focus on the research questions of the thesis while developing a user-centered digital library, through establishing limitations and goals for the project. The initial stage was thus designed to have an impact on the subsequent phases of research and development, where the overall mission and vision of the strategy reflected the problem formulation and aim of the thesis. Having concluded each major stage of development, it is possible to look back and discuss the validity of the decisions, limitations and goals of the strategy.

Starting off, one may first recognize that each of the five short-term objectives from identifying user needs, to performing usability evaluations were completed. This would perhaps indicate that the quantifiable targets were realistic for the project, yet Buchanan (2010) argues that the pre-defined strategic choices that influence and limit the choice of technologies, design principles and approaches used to execute the objectives have to be fulfilled. In the case of Publizebra, the strategic choices were not tied to any external stakeholders or institutions with particular interests or requirements that could impact development (Mendelson et al. 2013). The carte blanche situation meant that the strategic choices of Publizebra could to a great extent be decided based on thesis limitations and technological preferences of the sole developer. This situation is interesting to discuss in the context of LIS and digital libraries, as the project is demonstrating a selection of strategic choices in the development of a digital library from scratch. The strategic choices may thus display alternative approaches for providing content in small-scale and lightweight projects. However, the thesis is acknowledging the difficulty of applying such choices in projects where open access, wordpress-based infrastructure or lack of long-term connections to stakeholders or organizations is not feasible. This highlights the relative ease of development that the strategic choices of Publizebra resulted in, where the quantifiable objectives may have been more different or difficult to complete if the project involved external stakeholders or services with particular strategic choices and requirements. Hence Publizebra did not have to adhere to any third-party policies, technologies, ontologies or preferences in order to reach the short-term targets.

The main considerations for Publizebra aside from utilizing wordpress and an open accessibility policy, focused on the implications of sustainability in the features being developed. The importance of sustainability functioned as a basic requirement for the features and content to be developed, and was effectively established in the discovery phase prior to practical development. Looking at the strategic choices and short-term targets as a framework for the project, the discussion will regard them as realistic and achieved. The limitations and objectives imposed did not cause any major difficulties or problems during the subsequent stages of development, while acknowledging the context of which Publizebra was created by not overstepping ambitions; such as launching a finished product prior to more testing or integrating it with any existing self-publishing service.
7.2 THE DISCOVERY PHASE

The discovery phase spanned across a set of qualitative methods for identifying user needs, existing services, features, the role of stakeholders and user-centered design in special digital libraries. These qualitative segments not only sought to help answer the fundamental research questions of the thesis, as it further intended to push development forward through the RABBIT user-centered design process by Still and Crane (2017).

The environmental scan of special digital libraries revealed user-centered design principles that were later applied in the development of Publizebra, such as consistent menu structure, navigation and unified design. The research on special digital libraries highlighted the importance of developing a service that does not unwarrantedly change behavior of users where it is not necessary, instead attempting to provide and understand features and user needs where they are called for. For the subsequent stages of the discovery phase, the initial analysis of special digital libraries enhanced both research questions through additional insight in how to perceive user needs and applying practical design principles.

The review of self-publishing services provided by public libraries brought the discovery phase to an interesting stage of development and research for the project. The investigated services are not only presenting real-world and explicit ways that digital libraries are aggregating information and resources for self-publishing authors, as they further shed light on potential user needs and features of independent authors that these services seek to address. Setting aside the development of Publizebra for a moment, and simply looking at the environmental scan of available digital library services in relation to the stated research questions, one may end up with a relatively compelling list of features and approaches that these libraries have developed and contributed to LIS. The notion that they have been initiated, funded, launched and maintained is arguably an attest to being legitimate ways that digital libraries can support self-published authors. Hence, in answering the second research question these services must be acknowledged as an important part of understanding digital libraries for self-publishing, even though many of their traits are not necessarily replicated in the Publizebra prototype. By the same token, the service developed by Publizebra alone does not fully illustrate a quintessential answer to the research question. This is realized in the environmental scan, by discussing the strengths and weaknesses of existing services while placing it in the context of the strategy and limitations of Publizebra. The importance of sustainability and accessibility, along with the possible consequences of including external stakeholders in a digital library according to Rathi et al. (2017) had a strong impact on how Publizebra could potentially utilize aspects of existing services both in their features, infrastructure and user needs. Following the RABBIT design process, the knowledge and insight gained from previous projects pushed the development of Publizebra forward to help define project objectives and to find alternative solutions and approaches for providing features and user needs in a user-centered manner.
The next step of user need assessment heavily contributed to fundamentally outlining the user needs and value-adding features of self-published authors based on the selected empirical scope to review. While the findings are extensively presented, analyzed and discussed to understand user needs and features during the environmental scan, this discussion will not concentrate on the particular findings of self-publishing. Focusing on what the findings mean for the realm of independent authoring would be a thesis in itself, and risk further distancing the thesis from the concepts of user-centered design and development of digital libraries. In the context of developing a user-centered prototype, I would argue that it is more important to critically discuss the user need assessment methodology and what it means for the project. Due to the thesis limitation of not being able to bring on end-users in the form of self-published authors for the discovery phase, the degree of user-centered design in the user need assessment and discovery phase is indeed questionable. However, the thesis is successfully adhering to the qualitative research strategy of user need assessment to answer the research question, by reviewing a wide range of sources, contexts and empirical data associated with the methodology (Geisler & Vine, 2014; Goodwin, 2009).

The environmental scan of user-centered special digital libraries unveils the importance and consequences of not involving users at an early stage of development, to avoid miscalculating or assuming user needs as stressed by Still and Crane (2017). For Publizebra, the lack of end-user involvement may serve as a reality-check for how relatively early in development the prototype is currently in, and what remains to be conducted. The previous and subsequent stages of user-centered design that are covered in the project have arguably been executed to recognize this issue however. Keeping the door open for iterative and future involvement of self-publishing authors to re-define user needs and features is part of the strategy, followed by usability evaluation initially limited to experts. Hence the user need assessment is by no means static for the Publizebra service, yet it is possible to outline a range of user needs and features to base development on, as the environmental scan demonstrates how each special digital library re-evaluated user needs to improve the service. The notion of iterative development of user needs and features is further exemplified in the Los Gatos self-publishing service, where the user need of an authoring service was identified and initially provided, without the additional need of discoverability (Bankhead, 2015).

The user need assessment provided a detailed basis for answering the first research question, yet in order to achieve the quantifiable strategic milestones for the prototype, it was necessary to create a list of attainable, prioritized user needs and value-adding features. The conceptual needs structure of Keller and Kotler (2017) sufficiently helped to categorize and connect the wide range of needs and features, making them tangible and distinguishable to particular author goals and characteristics. While the conceptual needs section of the discovery phase is presented short and concisely, it is important to stress its underlying significance for consecutive stages of development. Firstly, the conceptual model established three distinctive types of author needs of library acquisition, standardized quality and marketing with corresponding features to recognize when defining the project objectives.
Secondly, these user need concepts strongly constituted the basis for user personas conceived during the latter phase of information architecture, as suggested by Dobreva et al. (2012). Additionally, the stated, real and unstated needs further provided the developer with a more digestible and less abstract view and reference frame of how a digital library may serve self-publishing authors.

Finalizing the discovery phase by establishing the project objectives going forward was based on findings from each individual moment of the environmental scan and user need assessment, combined with the strategic goals of the project. The resource-heavy and stakeholder dependent elements of existing library services was neglected in favour of light-weight, sustainable and accessible features to showcase alternative methods for distributing and aggregating information. The most unprecedented feature conceived from the discovery phase is perhaps the bok-till-bibliotek application, connecting public libraries in Sweden with independent authors. While the feature is not endorsed or developed in conjunction with any library institution, it was envisioned as an independent service corresponding to both user needs of authors and libraries. The project objectives formed an additional framework for how features and the website should be developed, establishing the scope of work required for the information architecture, design, prototyping and usability evaluation.

The requirements document functioned as a transition between the fundamental literature review section of the thesis and the applied research to be conducted during development. The findings of the discovery phase were grouped and prioritized for implementation in the planned prototype as requirements, together with user-centered design principles forming an overview of how these would be integrated. Following the notion of user-centered design by Still and Crane (2017) through not prioritizing non-contributing features, the tiered list of MoSCoW was a successful choice for development as it could prioritize the project objectives. Further, the grading of requirements enabled for a scope of work that extended the main objectives by stating features that may be developed down the line such as ISBN barcode generator.
7.3 THE INFORMATION ARCHITECTURE

Continuing where the discovery phase concluded in establishing practical requirements and development of the prototype, the information architecture phase sought to add structure and coherence to what the discovery phase identified. For Publizebra the chapter was largely focused on conceptually describing the relations of user needs, features, users and the digital library to motivate design decisions and infrastructure.

The creation of user personas was mainly based on the perceived conceptual user needs and established project objectives, conveying these into a storytelling format as suggested by Goodwin (2009). The storytelling element made use of the scenarios identified in research, expressed by self-published authors and public libraries as potential characteristics of user groups. While the personas of the Publizebra prototype may appear as relatively specific in user goals, attributes and scenarios it is important to remember that these have been designed to represent a wider range of service users, as advocated by Dobreva et al. (2012). This is perhaps where the criticism of Chapman and Milham (2006) in the lack of validity of personas representing few or many users is most relevant to discuss, especially as the empirical basis of Publizebra does not involve interviewing end-users. Focusing sternly on the validity is arguably necessary when dealing with a narrow set of users, such as the VisInfo special digital library, in order to not base development on a perceived user group that does not correspond with end-users. Here one may consider that with the ongoing increase of self-publishing authors as indicated throughout this thesis, the level of validity of personas is more difficult to determine as potentially anyone could independently publish in one way or another. To then have user personas based on three major user needs and corresponding features that are applicable to a broad range of users, is perhaps of most interest when developing a prototype like Publizebra. Further, applying a broad range of users is motivated by avoiding creating an abundance of narrow personas complicating any design decisions (Still & Crane, 2017).

The outcome of creating a set of personas for the development of Publizebra greatly echoed the strengths of the methodology from a user-centered design perspective as suggested by Dobreva et al. (2012) among others. The notion by Goodwin (2009) and Dobreva et al. (2012) of an increased engagement and recognition of user needs and traits when working with personas instead of data, was true for the development of Publizebra. While difficult to practically present and quantify, the cognitive understanding of users became clearer in the form of user personas compared a list of conceptual user needs. In turn the use of personas made it possible to look at these conceptual users for the smallest to more principle-based design decisions during the development stages as proposed by Still and Crane (2017). The main cases where this type of user-centric development occurred was during prototyping and aesthetics; The terminology used for the prototype attempted to reflect a broad range of users by sticking to an uncomplicated and welcoming tone and language, while the minimalist design and simplicity of visual and interaction design was motivated based on these personas.
In gravitating towards a more structured understanding of how user needs and value-adding features could be provided within the Publizebra service, the use of a conceptual network model for mapping out the underlying structure and relations as suggested by Parush (2015) contributed positively to development. This critical stage within information architecture notably improved aspects of the design process that cannot be underestimated, as it accelerated development while providing solutions to design decisions. Most importantly, the network conceptual model established the first visual representation and framework of the service. Placing all the concepts and content of the service with its links and relations on a single page generated both cognitive and strategic frameworks for development as suggested by Sharp et al. (2015). Similarly to the clarity and recognition of traits and user needs that was gained from user personas, the network model greatly reflected the notion by Parush (2015) of conceptual representation to better understand abstract concepts. The different features, categories and content established from the discovery phase and persona scenarios could then be visually presented in a unified format suited for human perception (Ibid.).

The outcome of creating a visual representation mainly related to enhancing practical aspects of development as a structured reference framework for wireframing and prototyping. However, the actual procedure of constructing the conceptual map is worth discussing, as it gained a greater understanding of how Publizebra could be designed. Firstly, the selection of a network model for the digital library over the wide range of forms available depending on service and workflow presented by Parush (2015), was not a minor design decision. The choice of conceptual model for a service is conditional to the fundamental idea of how user needs and features should be prioritized, ordered and accessed (Ibid.). For Publizebra this resulted in a reflection upon how user needs and features may be logically ordered and presented for the end user, which in turn highlighted the relation between library acquisition and the bok-till-bibliotek application. The network model was deemed to be most logical for the project, as the remaining user needs and features were not believed to require the same type of rational order as anticipated for the bok-till-bibliotek section. Here one may argue that the selection of conceptual model has far reaching implications for the user-centered design of a service, as it affects the workflow and underlying structure (Ibid.). It is a valid criticism to point out that in the end it is a design decision that cannot be taken for granted; It is possible to argue that another conceptual model would work for Publizebra, with a different logical order to how content and features could be sequenced and related.
Following the path of visual presentation, the medium-fidelity wireframes were created based on the previously established conceptual models of user personas, requirements document and network model. Having these conceptual reference points for development provided a clear vision of the relations, user needs and features that the service should contain. With the help of following the established visual and interaction design principles these could practically be implemented in a 2D format. For Publizebra the wireframing started off by establishing a skeleton for the most primary design principles related to navigation and structure of the main elements, such as main menu, header and sub-menu. The conceptualized content and requirements of the prototype were populated in three tiers reflecting the network model; landing page, main category page and user-goal sub-page along with the bok-till-bibliotek page. The main problem during the wireframe development process, aside from balancing the design principles with content, was to recognize the limitations and capabilities of the wordpress front-end of which the prototype was to be built. The layout, interaction and functionalities illustrated in the wireframe thus had to be achievable within the CMS. Having previous experience with the wordpress suite and its themes, elements and common widgets was of significant help at this stage. In addition to knowledge of the CMS, the library services of Bookbusters, LAPL writes and SELF-e provided practical examples and inspiration for how concepts and elements can be built and presented in wordpress.

The wireframing process of Publizebra was to an extent iterative, as the creation of models involved going back and forth between applying design principles, features and user needs to ensure and evaluate that each of these were implemented. However, this process was from start to finish executed by a one-man team without any iterative feedback from external designers, users or experts. The importance of a wireframe is according to Still and Crane (2017) relative to the service being developed, as in some cases very basic low-fidelity wireframes are sufficient for a project. The notion of bringing on an expert or a team to evaluate the wireframe prior to further development is commonly conducted in projects (Goodwin, 2009; Still & Crane, 2017). Here one may argue that the Publizebra project should have received feedback and further iterative development during this earlier stage, rather than during prototyping. In the context of Publizebra, the wireframe was designed to provide a basic skeleton with the planned features and content to be developed during the subsequent stages of design and prototyping. To not conduct any evaluation session for the wireframe was mainly due to time limitations of the project and the medium-fidelity format with relatively stripped content to review. Hence any form of evaluation was prioritized once a more content-rich and visual prototype was built based on the wireframe. With the heuristic and expert evaluation in hindsight however, one may certainly argue that some of their feedback, such as scaling of content and clustering of information may have been pointed out and improved prior to prototyping based on evaluating the wireframe.
7.4 THE VISUAL AND INTERACTION DESIGN

The practical process in implementation and reasoning for design principles has previously been covered at length within this thesis, and as such the contribution to the development process is to a great extent found in the previous design and prototyping chapters. Therefore, this discussion will instead focus on how the impressions, ratings and suggestions expressed by the heuristic and expert evaluators correspond to the design principles established for Publizebra. The feedback may thus shed light on what worked as intended and what did not, along with what the prototype missed out on and needs to achieve and implement going forward. The lion share of visual and interaction design evaluation occurred during the expert evaluation, yet the heuristic evaluation pointed out a discrepancy between intended design choices and how they were implemented. The evaluator found the size and scale of headers and buttons to be dominating and intimidating while using the site, which highlighted a failure to balance principles of both visual and interaction design. The notion of visual hierarchy of elements and text, along with readability and home page principles as described by Krug (2014) turned out to be overemphasized and requiring slight adjustments. While these issues were adjusted prior to the expert evaluation, it is important to acknowledge for the second research question how these aspects of the initial implementation were not believed to be beneficial for the site.

7.4.1 VISUAL DESIGN DISCUSSION

The participating expert evaluators rated the visibility of which elements that were clickable to be clear. The only failure in use of affordances as put by Krug (2014) to accentuate what objects to interact with, was the lack of underlining the bok-till-bibliotek header link on the library acquisition page. The visual hierarchy received positive feedback in how information and content was displayed clearly without any unnecessary sections that drew attention. The use of visual hierarchies to draw attention to important sections was however slightly impaired by the impression that some beneficial information was difficult to find due to its placement further down on pages.

Consistency of design in recurrence of elements for unity is an area where the feedback of evaluators reflects the difficulty of balancing visual design, and the need for further development. Krug (2014) points out the issue of succeeding in creating a consistent design yet failing to add enough distinctiveness and personal touch to not be experienced as generic.
The balancing of visual design was to a degree not achieved by the Publizebra prototype, as one participating expert articulated the terms consistency in design and harmonizing use of colours, another pointed out the consequence of such design in finding the website to be plain. Overall, the use of recognizable and understandable icons was achieved as the icons were considered clear in design.

However, for the concept of quality control the error of having two separate icons did cause confusion, which in turn resulted in valuable feedback. As the expert found the icons to represent different concepts while indicating which one suited the idea of quality control the most, Publizebra may thus stick to one of them and know that it is perceived as more suitable for the concept.

In visual readability and simplicity, the human-centered designer Goodwin (2009) points to the importance of using typefaces that are functional at smaller sizes. The prototype used a font recommended for paragraphs and lesser sized text, yet it turned out to be a major weakness and obstacle of the digital library, being suggested to change it. Readability of an informative site is essential, and the feedback of having a typeface that is not pleasant for the eyes to read must be placed at the top of priorities for further development of Publizebra.

7.4.2 INTERACTION DESIGN DISCUSSION

Nothing in the feedback during testing and reviewing would imply any issues in the use of conventions; as home page menu option, search bar and use of the top left placed logo to return to the home page, was not reported to be misplaced or unavailable. One should mention however, that the search function stressed to be available by Krug (2014) and found to be of use even in few-paged special digital libraries as shown by Manzari and Trinidad-Christensen (2006) was not once utilized during any of the tasks. To test the functionality of search and retrieval would thus require further testing and cannot be discussed or analyzed at this stage.

The breaking up of pages to form visual cues, relationships and differences between content when browsing through pages did have its problems, as one evaluator found information to not be logically clustered on pages. The heavy focus on boxed content, section breaks and multiple headers on every page had perhaps in this case a negative effect on the individual wanting a more clustered structure of information. On the highest level of breaking up pages however, the main menu was found to be clear and logical for identifying and separating the various sections of the site.
The idea of creating a table of contents functionality to pages by using descriptive and clear headers, allowing for quick scanning of content to identify areas of interest (Krug, 2014) was partially achieved and partially unsuccessful. Scanning of content succeeded in displaying where more information could be accessed for the tasks as achieved by two evaluators, yet the prototype arguably failed to highlight the value-adding features for library acquisition, design and production as the tasks were conducted.

In the case of library acquisition policies and aspects increasing the chance of having a book acquired, such information was placed on the library acquisition page and bok-till-bibliotek application, yet one expert did not find it when actively looking. Notably this was expressed by the evaluator that did not find information to be logically clustered, the placement of library acquisition information on these pages was not accentuated or clustered any differently. As the information concerning library acquisition is critical to know when utilizing the bok-till-bibliotek application, it is important to recognize the failure of providing the information to users for any future development.

To navigate the prototype is an area where the intended outcome of the interaction design backfired the most. While no evaluator felt that they suddenly ended up on another site due to lack of persistent navigation, the amount of different menu and on-page alternatives for reaching the same content caused confusion. An example of this can be seen on Figure E.2 where a total of four entry points exists for each design & production sub-page. The idea of a “you are here” reassuring concept in the navigation of the site as promoted by Krug (2014) and attempted in the prototype was clearly not fully achieved; as the opposite effect occurred making one user uncertain of being on the appropriate page due to the many alternatives. To reduce the amount of entry points was suggested and should be recognized if Publizebra does not wish to have its visitors lost in space.

The interaction design principle that was most strikingly missing in the prototype and critical to acknowledge going forward, was the intended goals of the home page. The landing page missed out on providing users with the professionalism and reliability transmitted by letting visitors know who is developing the website and how to contact them, and whom it is of interest for. Key objectives of the home page included applying principles of Krug (2014) to have a broad range of visitors find user needs and value-adding features, while conveying the site identity and mission to inform the visitor why it is there and why it is of value. These objectives fell short due to the lack of any identity-giving features of a detailed, formal introduction to the service on the home page, or the option to access an about us page to learn more and gain trust with the site. The Publizebra prototype focused on pushing the access to content pages of the various user needs, failing to fully introduce the service as a whole or why the features may be of value for the visitor.
7.5 THE PROTOTYPING

The prototyping phase of Publizebra marked a significant change in development from conceptual models to practical implementation of the previous stages on a live and interactable prototype. Initially the development focused on creating the layout and structure as designed in the wireframes for the wordpress front-end, generating a base model for each outlined category and page. The creation of pages strictly followed the network conceptual model, in order to form the correct hierarchy and relations between concepts and content. Creating a high-fidelity prototype that is serving its purpose as described by Goodwin (2009), requires the network of pages to be functional and enriched with what the thesis had established in terms of research, design principles and project objectives. The research questions of the thesis were central to the prototype, as the Publizebra prototype attempts to provide and present the findings along with possible solutions to user needs and value-adding features in a user-centered manner. The formulation and placement of every header, paragraph and category along with the selection of images and materials were thus not haphazardly created, as serious attention was placed on considering the user personas, interaction design principles and purpose of the project.

Sharp et al. (2015) considers prototyping to be central for the evaluation of design and ideas, hence it is important that the content being developed and evaluated actually reflects the intended use-case. The main challenge during prototyping then turned to translating and conveying content to Swedish, while following the principles and conceptual models of the project. The user personas and the idea of a broad range of users greatly contributed to the process of writing and presenting the various concepts and content on the site, as the verbiage, feel and description of user needs and features could be directed towards perceived users. Additionally, the available writing on the subject of self-publishing in Swedish by Wiman (2017) and Svensson (2017) both aimed directly towards independent authors, helped to find suitable wording for concepts and features. The practical work with wordpress was effortless without any critical issues that would stop development, as the proposed elements of the wireframe could be replicated in the CMS through the use of standard widgets, buttons and boxed layout. Additionally, the flow and load-speed of the developed content and pages could be tested in real-time as all content was created live through the wordpress site builder. The practical prototyping process further contributed to experimenting with the concepts of the second research question and aim of the thesis, especially in how it may possible be aggregated and provided in a Swedish context.
7.6 THE USABILITY EVALUATION METHODOLOGIES

Initially Publizebra benefited from the evaluation methods conducted in previous research of special digital libraries, by identifying useful user-centered design elements for development while reaffirming the importance of evaluating a prototype. The project then underwent an iterative evaluation process using two inspection methods for usability evaluation, rejecting at this stage empirical methods of assessing usage data from end-users (Fernandez et al., 2011). This discussion will focus on how the inspection methods functioned and contributed to the development of Publizebra, to highlight the validity and outcome of utilizing these methods.

7.6.1 THE HEURISTIC EVALUATION

To conduct heuristic evaluation on the live prototype was a time-efficient process for the project to gain qualitative data, due to the low amount of logistics and organizing required compared to other methods such as interviews or focus groups (Still & Crane, 2017). The configuration of a slide-in form layered on-top of the site for providing the ten heuristics did however cause unnecessary confusion for the procedure. In order to perform the heuristic evaluation, the SSLIS lecturer’s only requirement was for the ten heuristics and the prototype to be available online. The intention then was to offer a seamless way of answering the heuristics in real-time with the presence of a slide-in form on each page, compared to an isolated form on a dedicated page once the site had been reviewed. The evaluator was not certain if the feedback entered in the form was specific to the current page or globally, although it provided an option to specify particular elements being reviewed. Conclusively the evaluator did not provide page-specific data for each heuristic, rather delivering a single customary form based on a full review of the site. The issues caused by arranging the evaluation session in a relatively unconventional fashion gained further insight in how forcing needless behaviour can be detrimental for its intended purpose. The slide-in form arguably caused more harm than good by taking up space on the site, which for a checklist of heuristics may reasonably be avoidable by keeping it in a separate window or tab. Hence, Publizebra could possibly have applied a more conventional model used in previous projects, while asking for more detailed preferences in addition to a longer introduction to the session as suggested by Goodwin (2009). In the case of Publizebra the evaluator was well-acquainted with Nielsen’s heuristics and managed to provide valuable feedback by filling the form, while being able to articulate and set aside the uneasiness caused by the particular format used.
The feedback successfully contributed to the development of the prototype, as visual and interaction design issues were highlighted that would require more work to adhere to a minimalistic design. Still and Crane (2017) points out an important notion of benchmarking in Nielsen’s heuristics to consider here, as only particular aspects of the prototype were deemed unfavourable. The fact that most heuristics were successfully marked off as achieved provided a positive outlook for the prototype and project going forward, where further development and improvements to the implied design issues could be focused on while acknowledging the otherwise affirmative benchmark.

In the context of an iterative design process to improve usability, it is perhaps difficult to discuss the efficacy of the heuristic evaluation without bringing up results of the succeeding expert evaluation. The first evaluation method did indeed point out issues of familiarization and introduction to the service, who would later be echoed in the expert evaluation and deemed a critical interaction design flaw. From a development standpoint the familiarization and introduction were not improved or prioritized following the heuristic evaluation, as it was not a persistent or emphasized issue for the lecturer, that did grasp the site after a brief overview. In hindsight of having performed two evaluation methodologies, it becomes apparent that properly introducing the service was overlooked during the iterative prototyping process, and that feedback contributed greatly to identifying it.

However, it is further of interest to recognize that the topic of familiarization and introduction was the only overlapping usability problem clearly identified by both evaluation methodologies. Nielsen and Landauer (1993) argues that up to 75% of usability issues can be identified by heuristic evaluation alone, while Lanter and Essinger (2017) are believing it to be a conclusive method prior to usability testing. Considering the perceived potential expressed by the authors above, while recalling the divergent findings of expert- and heuristic evaluation in the case of Publizebra, it is difficult to grasp how much of its potential the heuristic evaluation brought to the table. Is it possible to imply that the evaluation method sufficiently established 75%, or even 50% of design issues in the prototype? Further one may then suggest that usability testing with end users would have been a more legitimate next step over expert evaluation, yet this thesis will stand by the use of experts. For Publizebra, the addition of a second inspection method was prioritized to balance the problem of solely relying on an individual’s interpretation of heuristics, as expressed by Stickel et al. (2010) along with Hall (2017). While it is impractical at this stage to predict how users would have responded and performed in usability testing (as it has not been conducted) following only heuristic evaluation, it is possible to point out the key usability and design issues from expert evaluation that were not identified in the prior. Discussing the contribution and functionality of the expert evaluation may then also provide a greater insight in how the heuristic evaluation performed, along with how both methods together contributed to the iterative development process.
7.6.2 THE EXPERT EVALUATION

Conducting the expert evaluation in relation to heuristic evaluation, required significantly more time for preparation and collection of qualitative data during the development process. The evaluation involved a threefold participation of evaluators and shift from a predefined list of common heuristics, to a test plan and design review particularly arranged and for the prototype not conducted by experts previously. The rigorousness of an expert evaluation partially relies upon the quality of its guidelines according to Fernandez et al., (2011), and as such the test plan of Publizebra attempted to structure and formulate tasks and questions in a coherent yet open ended model that would return relevant qualitative feedback. Further effort had to be placed on avoiding confusion due to task sequence or wording, in order to minimize need for moderator help as suggested by Rubin and Chisnell (2008). The moderator role remained passive however, as the three evaluators independently completed the procedure from start to finish. The successful completion of tasks without any critical errors, combined with consistent and detailed open-ended feedback on questions may possibly be an indication that the quality of guidelines were sufficient for the evaluators.

The functionality of Hotjar for the evaluation turned out to be minimal, as the analytical tool was implemented to identify where critical errors or low-level design issues occurred that would block evaluators from finalizing and providing sufficient feedback on the actual tasks. The use of Hotjar to identify issues was further reduced, as the expert evaluators in the form expressed qualitatively where and how they encountered less-critical issues, such as the limited region selector or missing underlining of text link. The value of tracking evaluation sessions through Hotjar should not be underestimated however, the tool would have been significantly important for diagnostics and revision if high rate of low-level issues plagued the site with broken links, missing pages and errors stopping the evaluation. For Publizebra the analytical tool mainly served to verify that the task sequence of evaluators was followed and completed, connecting the timestamps of the evaluation form with the sessions tracked by Hotjar.

The expert evaluation notably contributed to the prototyping process as usability issues of the service that had previously not been found or overlooked, were identified and underlined by the three experts. The overall impressions of the site were not strikingly coinciding however, as the minimalist and simple design approach received a mixed judgment, yet particular aspects and elements of the prototype were exposed by more than one evaluator to be in need of improvement. The evaluation did not only result in doom and gloom, as various parts of the intended design were affirmed to be functional such as ease of language, menu navigation and clarity of pages. In order to adhere to a user-centered design, it was evident that the outcome of the evaluation would iteratively send the development of Publizebra back to the stage of information architecture.
The need for jumping to a previous stage of development is to evaluate the need for additional pages and implement additional interaction design principles on the prototype, to increase the level of trust and value of the service to end-users. In terms of development-progress one may regard the results of expert evaluation as a setback for the project, yet it is only innate to the idea of an iterative design process to go back and re-design based on feedback (Goodin, 2009).

For Publizebra the expert evaluation was of great help as it indicated how early in development the project was still in, considering the identified usability issues associated with an early stage of development by Rubin and Chisnell (2008). Catching usability issues before testing with end users as suggested by Harley (2018) was one of the main reasons for conducting expert evaluation, then was the outcome defensible for conducting it over usability testing with end users? This thesis will suggest that expert evaluation was justifiable as part of an iterative design process, due to the amount of glaring usability issues that were not identified or exemplified through the use of simply heuristics. Heuristic evaluation in itself did improve visual and interaction design principles through practical suggestions, yet the expert evaluation resolutely brought back the development of Publizebra to an earlier design stage to eliminate usability issues. Following the idea by Harley (2018) to not waste the time of real users on redundant issues, the expert evaluation may further be substantiated.

The evaluation further added a dimension of attempting to understand the end user, as the experts not only expressed issues reflecting their personal use of the site, but also concerns for how end users would find a lack of trust, potential and readability. It is crucial to note that while the experts provided feedback through tasks replicating the user needs and scenarios of end users, an inspection method can never replace real-world users (Fernandez et al., 2011; Still & Crane, 2017). The importance of separating expert evaluators and end-users according to Khoo et al. (2012) lies in the notion that usability concepts and views may be fundamentally different between the two groups. The discrepancy amidst expert and end user is well acknowledged in this thesis, where the evaluation conducted is not never regarded as an inclusion of end users. The heuristic and expert evaluation has more than anything motivated sessions of testing with users for future iterations of the prototype. Considering the limitations of the thesis, one may argue that the amount of qualitative feedback at an early stage of development has provided a solid groundwork to attain for introducing the prototype to end users. Below is a list of potential implementations and development outlined to be of highest priority for Publizebra going forward based on the expert evaluation.
7.6.2a VISUAL DESIGN CHANGES

Visually the prototype needs to address the Abel typeface and apply a font family that is commonly used on the web and considered more suitable for smaller text and paragraphs, in order to improve readability and simplicity of the site (Goodwin, 2009). Secondly the error of using multiple icons to represent the same concept should be resolved by using the suggested icon for quality control on all pages. The issue of generic design experienced by one usability tester can be prevented by attempting to create a more unique feel to elements and the overall design. The prototype should balance elegant design with breaking consistency and adding a more artistic touch associated with the work of a skilled web-designer (Krug, 2014).

7.6.2b INTERACTION DESIGN CHANGES

The issue caused by having too many alternatives and menus for accessing content can be tackled by focusing on the navigation options that worked. The main menu was considered clear and easy to use by every tester and helped to break up pages and separate content. One alternative is removing the secondary menu on all pages, and giving the main menu a static dropdown displaying the content of each category as currently occurring during mouseover. This solution would stick to the idea of not getting lost in space by Krug (2014) through indicating where in the structure of the page the visitor currently is, while limiting the confusion caused by the extra alternatives (by only having one).

7.6.2c CONTENT CHANGES

The additions of an about us page and a detailed introduction of the service are essential and a top priority for future development of the information architecture. The about us page should provide information about the creators of the site including contact information and the background behind creating Publizebra. The lack of trust, professionalism and reliability effects caused by not having such content on the prototype impacts the usability of the site, as the testers also found it hard to understand the value and target audience. If Publizebra wishes to increase the usability and user experience of the digital library going forward, these negative associations have to be eliminated.

7.6.2d FURTHER USABILITY TESTING – EXPLORATIVE AND SUMMATIVE

Once the above design changes and implementations have been executed, the iterative development must continue to perform usability testing. An explorative usability testing session should be initiated to assess if the most critical issues and impressions from the previous evaluation methods have been addressed and fixed. Once the high-level functionality is tested and improved upon, low-level testing of performance data to analyze interaction patterns and quantitative efficiency should be executed according to Rubin & Chisnell (2008).
8. CONCLUSIONS

The applied research project of Publizebra underwent five development stages starting from inception of a strategy, to fundamental research of the environment of digital library self-publishing services and user-centered special digital libraries. The discovery phase identified value-adding features and user needs of self-publishing authors, followed by development and design of how to aggregate and provide the identified needs in an information architecture. The project then created a set of content, features and resources for the prototype, while applying visual and interaction design principles and following project limitations and guidelines. Lastly, the materialized result of the five phases in the form of a prototype received feedback to improve usability and design from both heuristic evaluation and expert evaluation.

The mixed model of fundamental and applied research conducted in this thesis, has resulted in an investigation of various empirical areas associated with the problem formulation, aim and research questions designed to develop a special digital library for the benefit of Swedish authors. The investigation of special digital libraries that have been executed with user-centered design in methodology and evaluation, identified that important design elements and the necessity to not force or change the behavior of end users, is highly relevant developing a special digital library. The relation between LIS and self-publishing in the context of public libraries according to Sandy (2016) has received little attention in research, thus this thesis has contributed to the field by expanding the investigation of self-published services provided by public libraries. The mapping of available platforms corresponding to user needs and value-adding features of independent authors, highlights the current role of public library services and how information is aggregated, while further revealing possible issues related to sustainability and actual benefit for authors. The development of a special digital library following user-centered design principles and strategic goals of sustainability and accessibility, allowed for a more critical lens towards these existing library services to question their dependency on external stakeholders being of benefit for end users. The consequence of empirical research on special digital libraries, available public library services and an assessment of user needs and value-adding features contributed to the presentation of a new prototype in Swedish, corresponding to the problem formulation and aim of thesis.

For the development of digital libraries, the prototype demonstrates how a self-publishing digital library can be aggregated based on user-centered design principles and development, while suggesting practical tools such as bok-till-bibliotek for library acquisition, along with sustainable distribution of information. The notion of conducting usability evaluation further contributed to possible important interaction design principles to consider when developing a special digital library such as Publizebra, in readability and value of following home page principles of Krug (2014).
The conclusion of this thesis will lastly attempt to formally answer the research questions based on the fundamental research conducted and observations gained from practically developing and evaluating a special digital library prototype.

1. What are the user needs and value-adding features for self-published books and authors identified by public libraries, authors and research?

Sandy (2016) along with Carolan and Evain (2013) suggest that the needs and value-adding features of books and independent authors, largely reflect practices and notions associated with traditional distribution and production of books, yet these responsibilities are put in the hands of authors. The three areas of interest from public libraries, to author opinions and academic research display various ideas and perceptions of what is most important for self-publishing authors to understand, achieve and produce. Below are the most critical, common and viable user needs and value-adding features identified in this thesis.

Library acquisition represents an essential user need that is of convenience and desired for a wide range of self-publishing authors, where value lies in being able to submit books and be purchased following achievable acquisition standards, through commitment to quality while following practical guidelines and policies declared and promoted by the libraries (Bergström et al., 2017; Bruno, 2015; Carruba, 2014). The amount of self-published books submitted to public libraries have increased coupled with the expansion of self-publishing authors and books according to DeWild and Jarema (2015), yet the acceptance rate of self-published titles is lowered by the lack of standardized quality or following acquisition policies (Holley, 2015).

The user need of standardized quality is exposing the issue of visual and content quality of self-published books, where the production quality has been shown to be lacking (Bruno, 2015; Carolan & Evain, 2013). The value-adding features towards a book with standardized quality may be achieved through providing self-published authors with templates, knowledge and the opportunity through services to produce appealing titles (Carolan & Evain, 2013; Crawford, 2012; Thompson, 2012). Creating books with standardized dimensions, format and professional cover art along with properly structured content are key factors for self-published authors to succeed (Carolan & Evain, 2013; Wiman, 2017). It is of importance to highlight that benefit of quality and standards lies in the author understanding what creates additional value to content and visual elements of books, so that authors may pursue and achieve these value-adding features on their individual terms through budget or time allocation (Rutkowska, 2018; Diprose et al., 2017).

The addition of descriptive metadata to books is a value-adding feature that allows for cataloguing and semantic classification in databases where data such as language, author genre and key words allow for discoverability and interoperability online (Filmore, 2015).

Self-publishing authors further find themselves with the responsibility for marketing taking up time and becoming an important part of publishing independently (Carolan & Evain, 2013; Baverstock and Steinitz, 2013). Marketing is largely based in the digital realm where methods for communication has created the opportunity for authors to directly reach readers through social media, websites and communities (Philips, 2014; Skains, 2019). Proficiency, activity and an understanding of how to communicate and market on these online platforms is where independent authors are in need of knowledge. Marketing and communication are simply not a press of a button, as it will require dedication and inquiring of knowledge and audiences to be efficient according to research (Philips, 2014; Carolan & Evain, 2013). The value-adding features for self-publishing authors extensively relates to understanding what is expected, achieved and required when conducting a blog, having a presence on social media or taking part in special interest communities.

2. How may value-adding features and user needs be aggregated in a special digital library service to distribute information, resources and guidance for the benefit of self-publishing authors?

The major actor for aggregating publishing solutions to public libraries and subsequently independent authors is SELF-E, a subscription service for libraries consisting of three collaborating platforms associated with publishing (Anderson, 2016). The self-publishing author can find assistance with tools for producing books and e-books with industry standards through Pressbooks, publish into library collections with BiblioBoard and have titles reviewed by Library Journal to improve marketability (SELF-E, 2016; Bruno, 2015). SELF-E exemplifies how value-adding features and user-needs of self-publishing authors can be aggregated through utilizing existing and developed services corresponding to the needs of authors. The benefit of SELF-E for authors lies in how they may find use of professional services for free, supplied to a digital library platform and not dependent on in-house maintenance, knowledge and development by the library itself.
The dependency on multiple third parties for a digital library may have implications not explicitly of benefit for authors however, as the stakeholders involved in a digital library will according to Rathi et al. (2017) always have an impact on the end product. Considering the sustainability of a service, ensuring that it will function and be of use for the end user, is in the case of SELF-E conditional to all parties maintaining their service. The most striking outcome of depending on third-party stakeholders for any digital library using SELF-E, is the zero economical compensation for titles by self-published authors in library collections (Rooney, 2015; Bruno, 2015).

Royalty free licensing is part of the business model and not set by the library, meaning that while the digital library may offer patrons a one-stop shop for self-publishing user needs and value-adding features, these are provided on terms and conditions established by third parties (Bruno, 2015).

The SELF-E service has been implemented and utilized in different digital library settings, where LAPL Writes is an example of an already existing digital library platform incorporating SELF-E in their infrastructure (Anderson, 2015b). LAPL Writes is a demonstration of how central and public libraries can make use of their library resources, databases and information to aggregate a special digital library service dedicated to local self-publishing authors. The library card holding author browsing LAPL Writes may utilize the practical tools for production, publishing and distribution provided by SELF-E, while browsing a collection of resources accumulated and accessible from a single platform following the main library design by the LAPL organization (LAPL.org).

LAPL Writes is aggregating books, submission policies, links, events and online courses related to self-publishing from their collections and networks (LaRue, 2015b). The Los Angeles based service displays, aside from aggregating its available library resources, how a special digital library may further support independent authors with library acquisition and marketing by promoting writers through interviews and building a unique collection of titles published through the platform itself (Ibid.).

The value-adding features and needs of self-publishing authors may further be addressed without dependency on resources and infrastructure of an existing library collection and platform. The statewide BookBusters project of Minnesota Libraries is distributing the aggregated services of SELF-E in a lightweight and geolocated model directly targeted towards independent authors in Minnesota (Horton et al., 2018). BookBusters is offering production, publishing and distribution of e-books through SELF-E on a dedicated site available through libraries across the state, giving libraries the chance to refer patrons to a local community for creativity (Ibid.). BookBusters is distributing a simple, wordpress based digital library platform focusing on providing step-by-step guides and information of how to use the SELF-E services, highlighting the importance of metadata, book covers and structured content while promoting self-published books in a state collection.
The information provided on the site is not dependent on resources or knowledge provided by the participating libraries and their collections, as these may simply give patrons free access to the standalone service (Ibid.). The BookBusters project is demonstrating how it is possible to create a lightweight special digital library targeted towards a specific geolocated audience, while depending on an existing aggregated service such as SELF-E to provide the perceived user needs and value-adding features of self-publishing. The simple category-based home page of BookBusters consisting of three main user goals of create, share and read inspired how Publizebra presents user goals and features directly on the home page.

The notion of providing existing solutions to allow for production, publishing and distribution of self-published titles has further been adopted by Los Gatos Public Library in conjunction with Smashwords to develop eBook Self-Publishing Partnership, a unique model for engaging local independent authors (Pecoskie & Hill, 2014; Coker, 2013). The Los Gatos project demonstrates how a digital library platform may offer the features provided by a professional publishing service, while branding and connecting it to a local community and library collection. The printing, publishing and distribution features along with instructional guides available through Smashwords were aggregated in a Los Gatos themed service, accessible through the public library website (Bankhead, 2015). The implementation of existing solutions eliminated the need of developing proprietary publishing tools by the library, reducing costs and resources while still providing a unique platform dedicated to local authors (Ibid.). The Los Gatos project benefited independent authors through free access to commercial publishing services, with the possibility to produce e-books of standardized quality in layout and metadata (Pecoskie & Hill, 2014). The notion of creating e-books with standardized quality was further encouraged by the digital library platform, as titles that successfully followed publishing standards would be listed in a unique vendor catalogue and purchasable by the Los Gatos library (Pecoskie & Hill, 2014).

The e-book produced through the digital library service could thus be available in the very environment that it was created, providing authors with means of local distribution in conjunction to the publishing and production features (Bankhead, 2015). In addition to displaying how a one may provide lightweight support in digital libraries for self-publishing, through utilizing existing printing services as advocated by Crawford (2012), the eBook Self-Publishing Partnership is further highlighting possible implications of introducing multiple stakeholders. Upon relying on Smashwords to provide distribution of e-books generated through the Los Gatos platform, authors would unknowingly have their titles placed by Smashwords’ business model in a segregated and undiscovered vendor list for retailers and libraries, limiting the benefit of the service for authors (Bankhead, 2015).
In addition to mapping out the available digital libraries developed by public libraries and publishing services, this thesis presents a special digital library prototype for distributing information, resources and guidance corresponding to user needs and value-adding features of self-publishing in a Swedish context. Project Publizebra.se attempts to demonstrate how user needs and value-adding features of self-published authors may be aggregated and provided in an appealing and useful fashion, following a user-centered design methodology. The benefit of applying user-centered design, consisting of five development stages in a digital library for self-publishing authors is the prioritization of needs, goals and the success of end users being central to the methodology during design and development (Bašić, 2018).

Publizebra is providing information, resources such as cover art, ISBN-registration links and features corresponding to user needs of library acquisition, standardized quality of books along with distribution and marketing. The user needs and value-adding features aggregated on the digital library platform have been motivated following project objectives and three distinctive user personas, conceptualized through conducting a user need assessment during the initial discovery phase of development. The project seeks to improve sustainability and accessibility of the site for the benefit of end users, based on strategic goals and possible implications of including external stakeholders in digital libraries identified during environmental scanning. Dependency on stakeholders is avoided by developing proprietary applications with in-house maintenance, providing openly available material and creating content under creative commons 1.0(0) license. Accessibility of content is further pursued by requiring no registration process, fees or particular location in order to access information and features available on the live website. The prototype is structured based on a network conceptual model, resulting in the underlying relations and workflows of aggregated content being relatively unrestrained for the end user (Parush, 2015). The network model is designed to allow self-published authors the benefit of directly navigating and accessing user needs and value-adding features without enforcing a behavior; an essential principle of user-centered design (Parush, 2015; Bašić, 2018).

Following recent digital library projects such as BookBusters (2018), the Publizebra prototype is built on a wordpress frontend to build and manage content with an accessible and lightweight model commonly used on the web. The visual representation and functionality of the service is designed to correspond to the perceived behaviour of users while improving the user experience, according to user-centered design principles of interaction design and visual design (Goodwin, 2009). Clarity in communication of visual elements and content is attempted through the use of affordances with consistency to highlight the functionality of clickable functions, while visual hierarchy is applied to accentuate the priority and order of information and actions on the site (Goodwin, 2009; Krug, 2014).
To create an interactive service that is of benefit for the end user, Publizebra attempts to keep visual and cognitive load to a minimum when aggregating the identified user needs and features (Goodwin, 2009). Applying principles of interaction design in navigation and structure of content is pursued by following conventions in the placement of menus, buttons and search options while breaking up content and pages in distinctive sections to improve navigation and scanning of content for the end user (Krug, 2014).

Aside from demonstrating and reasoning for a special digital library based on conceptual models and practical principles of user-centered design, the project further presents findings from conducting heuristic and expert evaluation for how value-adding features and user needs could or should not be aggregated to benefit end users. To distribute information, resources and guidance in a digital library, balancing of readability and visual hierarchy of elements are important factors. According to heuristic evaluation, the size of headers, text and elements should not be superfluous or overstated unless it is justified for the end user, such as visually impaired.

To improve visual readability with user-centered design as suggested by Goodwin (2009) the thesis does not recommend the Abel typeface to be of benefit for paragraphs and smaller sized text, as expert evaluation found it to be unpleasant for reading. Providing access to one user goal or page from multiple entry points on a single page is further not endorsed, where confusion of being lost was experienced by experts when an abundance of both menu links and on-page alternatives to access one page existed.

According to Krug (2014) the key objectives of the home page is to convey the mission and site identity while informing the visitor of where she is and why it is of value for her. The expert evaluators pointed out a missed opportunity in the Publizebra prototype by not having an about us page or detailed introduction to the service, causing a lack of trust and reliability while falling short to express who the target audience is. Clearly following the home page principles of Krug (2014) is thus recommended when developing a special digital library to be of benefit for its indented end users.
8.1 SUGGESTIONS FOR FURTHER RESEARCH

Following the philosophy and methodology of user-centered design to involve end users early and often as put by Still and Crane (2017), this thesis suggests further research in the field of special digital libraries for self-publishing to conduct usability testing with independent Swedish authors. To gain further insight in the user needs, experience and impressions of end users would not only extend the research on how self-published authors may find use of a digital library, as it would push development of Publizebra forward as a logical next step following inspection methods such as heuristic and expert evaluation (Harley, 2018; Lanter & Essinger, 2017). Introducing Swedish authors to the prototype may also validate or invalidate aspects of how Publizebra suggests that user needs and value-adding features of self-publishing may be aggregated. The introduction of end users may further shift development of high-level functionality as dealt with in this project, to low-level testing of quantifiable measures such as performance data and analyzing of interaction patterns to improve site efficiency (Rubin & Chisnell, 2008).

Aside from research concerning user-centered design, it is of interest to conduct empirical investigations of how services with similar functionality to the American public library initiatives explored in this thesis would be perceived in a Swedish public library context. The need for self-publishing opportunities in public libraries may both be of interest to investigate from the perspective of patrons and library institutions in Sweden. Gathering impressions and opinions on the convenience or potential of implementing services such as SELF-E or LAPL Writes in a Swedish public library, may shed additional light on the current status of self-publishing in Sweden.


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Murray, P. R., & Squires, C. (2013). The digital publishing communications circuit. *Book 2.0,3*(1), 3-23. doi:10.1386/btwo.3.1.3_1


### Appendix 1: Heuristic Evaluation Form and Results

| 1. Visibility of system status: | yes, I am quite well informed of where I am |
| 2. Match between system and the real world: | I am not a wedish native speaker, so maybe my comments are not so relevant. But, I find this easy to understand |
| 3. Consistency and standards: | I find the website consistent |
| 4. User control and freedom: | Your web application follows the conventions - however, I do not get why the mouse pointer turns to x. That is usually something to cancel some activity - but that is again due to this heuristic form I guess |
| 5. Error prevention: | This is, I would say, done in a quite good way. But I have had a problem to understand how this evaluation menu works, and will my comments will be saved if I change the web page |
| 6. Recognition rather than recall: | No memory load |
| 7. Flexibility and efficiency of use: | It is efficient to use, but I have needed some time to understand what the website is for, and how I could eventually use it |
| 8. Aesthetic and minimalist design: | The first part of the website "behöver veta om egenutgivning" is too big. It dominates the page, and buttons on it are proportionally overwhelming to me. I believe that area should be smaller. It looks intimidating. Also the square blocks at the end of the page, they could have been up to 30% smaller I guess to arrive to minimal design |
| 9. Help users recognize, diagnose, and recover from errors: | This is well done |
| 10. Help and documentation: | I did not need any help |

**Additional Comments?:**

These are the only comments I had. My biggest problem was the size of elements. I find them too big. Like done for someone who really can't see well. Otherwise, quite nice designed, and I would say with good architecture, logical
Hej! Här kommer lite information innan vi börjar testa det digitala biblioteket.


Du får sedan svara på några frågor och kommentarer om uppgiften innan du fortsätter till introduktionen av nästa uppgift.

Viktigt att observera! Hemsidan sparar all interaktion och aktiviteter som analytisk data, utan att spara IP adress eller personliga data. För att aktivera insamlingen av aktiviteter är det viktigt att du besöker biblioteket manuellt, det vill säga skriver in det i adressfältet i en ny flik vid varje uppgift, då det ej går att spara data när en användare har "länkad" till hemsidan.

UPPGIFT 1: TIPSA ETT BIBLIOTEK OM EN BOK
Du har publicerat en bok och vill nu tipsa om boken som inköpsförslag till ett valfritt bibliotek i Stockholm, hitta ett sätt via Publizebra att göra det.

När du upplever att du har klarat av uppgiften eller inte hittar det du söker stänger du fliken med biblioteket och återvänder till den här formulärfliken.

ÖPPNA STARTSIDA I EN NY FLIK

För att starta din uppgift, öppna en ny flik och besök www.publizebra.se (för att kunna spåra interaktionen när du besöker hemsidan behöver du skriva in adressen själv)

UPPGIFT 1 UTFÖRD - FORTSÄTT TILL FRÅGOR OM UPPGIFT 1 *

Vad är klockan nu när du fortsätter till frågor om uppgift 1?

Exempel: 8:30
FRÅGOR OM UPPGIFT 1

När du besvarar frågor kan du fokusera på vad som var viktigast för just din upplevelse, till exempel: interaktionsdesignen, navigering av menyer, språket, bilder eller annat.


☐ JA
☐ NEJ

Motivera vänligen ditt svar ovan, hur upplevde du det enkelt eller inte enkelt? *


☐ JA
☐ NEJ

Öppen kommentar om Uppgift 1

Här kan du kommentera något du observerade under Uppgiften (generellt om Publizebra eller relaterat till Uppgiften)

UPPGIFT 2: MARKNADSFÖRING OCH DISTRIBUTION

Du har publicerat en bok och vill nu lära dig mer om marknadsföring och hur du når ut till läsare. Besök Publizebra och hitta information om marknadsföring eller en metod för att nå ut till läsare.

När du upplever att du har klarat av uppgiften eller inte hittar det du söker stänger du fliken med biblioteket och återvänder till den här formulärfliken.

ÖPPNA STARTSIDA I EN NY FLIK

För att starta din uppgift, öppna en ny flik och besök www.publizebra.se (för att kunna spåra interaktionen när du besöker hemsidan behöver du skriva in adressen själv)

UPPGIFT 2 UTFÖRD - FORTSÄTT TILL FRÅGOR OM UPPGIFT 2 *

Vad är klockan nu när du fortsätter till frågor om uppgift 2?

CXXV
FRÅGOR OM UPPGIFT 2

När du besvarar frågor kan du fokusera på vad som var viktigast för just din upplevelse till exempel: interaktionsdesignen, navigering av menyer, språket, bilder, visuell kommunikation eller annat.


☐ JA  ☐ NEJ

2. Motivera vänligen ditt svar ovan, hur upplevde du det enkelt eller inte enkelt? *

Öppen kommentar om Uppgift 2

Här kan du kommentera något du observerade under Uppgiften (generellt om Publizebra eller relaterat till Uppgiften)

Öppna Startsida i en ny flik

För att starta din uppgift, öppna en ny flik och besök www.publizebra.se (för att kunna spåra interaktionen när du besöker hemsidan behöver du skriva in adressen själv)

UPPGIFT 3 UTFÖRD - FORTSÄTT TILL FRÅGOR OM UPPGIFT 3 *

Vad är klockan nu när du fortsätter till frågor om uppgift 3?

Exempel: 8:30
FRÅGOR OM UPPGIFT 3
När du besvarar frågor kan du fokusera på vad som var viktigast för just din upplevelse, till exempel: interaktionsdesignen, navigering av menyer, språket, bilder eller annat.

1. Upplevde du något som var intressant eller värdefullt efter att ha utforskat Publizebra? Vad? *
Hittade du inget av direkt värde eller intresse? Kommentera!

2. Fanns det något som var förvirrande eller störde dig under uppgiften?
Beskriv din upplevelse av vad som förvirrade eller störde, om det inte var något som störde eller förvirrade så skriv nej, det kan vara både små och stora detaljer.


☐ JA
☐ NEJ
☐ VET EJ

Öppen kommentar om Uppgift 3
Här kan du kommentera något du observerade under Uppgiften (generellt om Publizebra eller relaterat till Uppgiften)

AVSLUTANDE DEL: UTVÄRDERING AV INTERAKTION OCH FUNKTION

CXXVII

- **JA**
- **NEJ**

1. Hur bedömer du tydligheten i huvudmenyn? *
   Till exempel om namnbeteckningen på alternativ i menyn är logiska och går att förstå i sammanhanget *Markera endast en oval.*

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

2. Hur upplever du navigationen mellan olika sidor på Publizebra? *
   Till exempel Hur lätt det är att gå från en sida till en annan utan att komma fel eller stanna upp och leta en längre tid *Markera endast en oval.*

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


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

4. Är språket naturligt formulerat så att ord, koncept och information inte är för komplicerade eller tekniska? *Markera endast en oval.*

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Språket är svårt att förstå</td>
<td></td>
<td></td>
<td></td>
<td>Språket är enkelt att förstå</td>
</tr>
</tbody>
</table>

5. Hur upplever du att bilder, ikoner och den estetiska designen relaterar till sidans innehåll? *
   Till exempel om du upplever att bilder är irrelevanta, eller ikoner tydliga och användbara

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CXXVIII
Intryck och Feedback

Öppna frågor där du kan dra personliga slutsatser och kommenterar om precis det du vill fokusera på. 21 Vad är ditt personliga intryck av att använda Publizebra? *

22. Vad upplever du att Publizebra har för styrkor?

23. Vad upplever du att Publizebra har för svagheter?

24. Förslag för att förbättra Publizebra

25. Avslutande kommentar: Övriga tankar om Publizebra

CXXIX
Appendix 3: Expert Evaluation – Testing of Usability
Results

Task A

Participant 1:

Q1. Upplevde du att det var enkelt att hitta ett sätt att tipsa bibliotek i Stockholm om en bok?
JA

Q2. Motivera vänligen ditt svar ovan, hur upplevde du det enkelt eller inte enkelt?

"Din bok på bibliotek" är ett logiskt alternativ i vänstermenyn. På sidan man kommer till finns det en tydlig text som talar om vad man ska göra (dock är länktexten Bok till bibliotek inte framhävd så det syns inte att det är en länk).

Q3. Uppfattade du någon information om vad bibliotek vill att egenutgivna böcker bör uppnå eller innehålla för att kunna bli inköpta på bibliotek?
JA

Participant 2:

Q1. Upplevde du att det var enkelt att hitta ett sätt att tipsa bibliotek i Stockholm om en bok?
JA

Q2. Motivera vänligen ditt svar ovan, hur upplevde du det enkelt eller inte enkelt?

Det var lätt att hitta. Eftersom jag redan i den föregående frågan utforskat sidan var det ännu enklare att hitta det jag sökte.

Q3. Uppfattade du någon information om vad bibliotek vill att egenutgivna böcker bör uppnå eller innehålla för att kunna bli inköpta på bibliotek?
NEJ, Jag letade svagt efter vad biblioteken ville ha/ krav på böckerna, men fann ingenting vilket är tråkigt. Då måste jag leta på andra ställen och risken är stor att man lämnar webbplatsen.

Participant 3:

Q1. Upplevde du att det var enkelt att hitta ett sätt att tipsa bibliotek i Stockholm om en bok?
JA

Q2. Motivera vänligen ditt svar ovan, hur upplevde du det enkelt eller inte enkelt?

Tydliga länkar finns till funktionen, lätt att orientera sig och hitta

Q3. Uppfattade du någon information om vad bibliotek vill att egenutgivna böcker bör uppnå eller innehålla för att kunna bli inköpta på bibliotek?

JA, Jo det finns, men informationen är inte realistisk utan syftar ju mest till att lyfta fram det som Publizera har fokuserat på som, korrekt text, bra omslag, ISBN.

CXXX
Task B

Participant 1:

Q1. Upplevde du att det var enkelt att hitta information om marknadsföring eller en metod för att nåt ut till läsare?

JA

Q2. Motivera vänligen ditt svar ovan, hur upplevde du det enkelt eller inte enkelt?

Tydligt alternativ i vänstermenyn gör det uppenbart vart man ska leta.

Participant 2:

Q1. Upplevde du att det var enkelt att hitta information om marknadsföring eller en metod för att nåt ut till läsare?

JA

Q2. Motivera vänligen ditt svar ovan, hur upplevde du det enkelt eller inte enkelt?

Stora tydliga menyer som visade var jag kunde hitta mer information. Det var inga störande moment så som rullande bilder och ”senaste nytt” som tog plats - därav att det gick mycket fortare att hitta information.

Participant 3:

Q1. Upplevde du att det var enkelt att hitta information om marknadsföring eller en metod för att nåt ut till läsare?

JA

Q2. Motivera vänligen ditt svar ovan, hur upplevde du det enkelt eller inte enkelt?

Task C

Participant 1:

Q1. Upplevde du något som var intressant eller värdefullt efter att ha utforskat Publizebra? Vad?

Innehållet är bra och lämpligt. Menyerna är tydliga.

Q2. Fanns det något som var förvirrande eller störde dig under uppgiften?

Jag upplevde det som att det var något förvirrande att samma innehåll kunde kommas åt genom olika menyalternativ.

Q3. Lärde du dig något om hur det går att förbättra kvaliteten under produktionen eller i designen av en bok?

JA

Participant 2:

Q1. Upplevde du något som var intressant eller värdefullt efter att ha utforskat Publizebra? Vad?

Det finns många ingångar till de tre huvudområdena (menyn till vänster (marknadsföring osv.) och den stora meny på sidan)

Det var en del information som var viktigt men som har lagts längst ner i sidfoten på vissa sidor. Det är lätt att gå miste om de länkarna.

Sidan Bok-till-Bibliotek fungerade inte riktigt då man inte kunde trycka på de andra länen.

Q2. Fanns det något som var förvirrande eller störde dig under uppgiften?

Informationen kunde ha organiserats på lite annorlunda sätt (har dessvärre inga förslag men information kunde ha klustrats på ett mer logiskt sätt). Teckensnittet är "tunt" och litet vilket gör att det blir svårt att vilja läsa längre texter.

Q3. Lärde du dig något om hur det går att förbättra kvaliteten under produktionen eller i designen av en bok?

NEJ

Participant 3:

Q1. Upplevde du något som var intressant eller värdefullt efter att ha utforskat Publizebra? Vad?

Intressant idé som sådan. Tyckte det var kul att kolla bildmaterialet.

Q2. Fanns det något som var förvirrande eller störde dig under uppgiften?

Presentationen av tjänsten är inte så tydlig. Tror man behöver satsa mer på att tydliggöra för målgruppen varför den är av värde för dem.

Q3. Lärde du dig något om hur det går att förbättra kvaliteten under produktionen eller i designen av en bok?

NEJ.

CXXXII
Additional comment:

Funderingen som jag är om vilken Publizeras största styrka är. Är det en tjänst som ska innehålla allt som behövs för egen publicering, eller är det något annat? Man kan också fråga sig till vem som tjänsten riktar sig. För mig framstår t ex tipset att alltid ha sidnumrering som något som alla förstår och vet, men jag kan ha fel.

Additional feedback and grading

Participant 1:

Q1. Hur upplever du att bilder, ikoner och den estetiska designen relaterar till sidans innehåll?

Olika ikoner för kvalitetskontroll känns lite märkligt, tycker det är bra med den lilla ikonen med förstoringsglaset medan pennan och papperet kanske signalerar något annat.

Q2. Vad är ditt personliga intryck av att använda Publizebra?

Överlag ett positivt intryck

Q3. Vad upplever du att Publizebra har för styrkor?

Bra och nyttig information som är lättillgänglig

Q4. Vad upplever du att Publizebra har för svagheter?

Viss otydlighet då samma information är åtkomligt från olika menyalternativt, det blir lite otydligt vad som hör hemma var

Q.5 Förslag för att förbättra Publizebra

Färre ingångar till samma information

Participant 2:

Q1. Hur upplever du att bilder, ikoner och den estetiska designen relaterar till sidans innehåll?

Det är en harmonisk kombination av färger. Designen är kontinuerlig och inte överflödig. Tydliga ikoner.

Q2. Vad är ditt personliga intryck av att använda Publizebra?

Enkel sida, enkelt att navigera. Dock kan websidan upplevas mindre pålitlig då det inte finns något att läsa OM publizebra. Teckensnittet var dessvärre inte skönt för ögat att läsa.

Q3. Vad upplever du att Publizebra har för styrkor?

Enkelheten är dess styrka.

Q4. Vad upplever du att Publizebra har för svagheter?

Resurser är en viktig del och bör läggas på ett annat ställe än i sidfoten.

Q.5 Förslag för att förbättra Publizebra

- Teckensnittet bör ändras. - Information om skaparna till denna hemsida / bakgrund / kontaktinformation - Bättre klustering av information
Participant 3:

Q1. Hur upplever du att bilder, ikoner och den estetiska designen relaterar till sidans innehåll?

Rätt ok design, men lite för schablonig (anonym) i mitt tycke.

Q2. Vad är ditt personliga intryck av att använda Publizebra?

Jag funderar på om detta är en tjänst som kommer att få kunder i omfattning. Tycker att råden är för självklara mestadels, och känner mig tveksam till en tjänst för att hjälpa personer som vill skriva böcker, men som inte vet något om ämnet.

Q3. Vad upplever du att Publizebra har för styrkor?

Den största styrkan skulle kunna vara att samla allt man behöver kunna och veta på ett ställe. Men tjänsten tycks mig i nuläget inte vara riktigt där.

Q4. Vad upplever du att Publizebra har för svagheter?

Marknaden för tjänsten i fråga, och att råden ofta är rätt banala i mitt tycke

Q.5 Förslag för att förbättra Publizebra

Jag kan inte ge förslag, känner inte marknaden. Men jag skulle tror att tjänsten behöver framstå som mer professionell och innehålla mer värdefulla funktioner för kunderna.

Additional comment:

Är pappersbaserade böcker framtiden för biblioteken, och finns det ett stort intresse att skriva böcker bland allmänheten? Jag tror inte det. Och jag tror inte att personer som vill skriva böcker primärt är intresserade att deras bok skall finnas på ett specifik bibliotek. Tror inte att tjänsten lockar seriösa författare

ORDINAL SCALE RATING

1. How do you rate the clarity of the main menu on a scale of 1-5 where 1 = Unclear and 5 = Clear

P1= 5, P2= 5, P3= 5

2. How do you perceive the navigation between pages on Publizebra if 1= Complicated and 5 = Easy

P1= 3/5, P2 = 5/5, P3 = 4/5

3. How do you find the clarity of which elements are clickable on the website if 1 = Unclear and 5 = Clear

P1= 4/5, P2= 5/5, P3= 4/5

4. Is the language formulated so that wording, concepts and information is natural and not too complicated or technical? 1 = The language is difficult to understand, 5= The language is easy to understand

P1= 5/5, P2= 5/5, P3= 4/5
Appendix 4: Images used without licensing restrictions

User persona images downloaded and used without licensing required, May 9, 2019 from

Appendix 5. Google Top Search Results of Self-publishing Terms (Incognito Mode)

Majority of top search results are commercial self-publishing services offering publishing packages and printing services.
Majority of top search results are commercial self-publishing services offering publishing packages and printing services.
Majority of top search results are commercial self-publishing services offering cover art, publishing packages and printing services.
Majority of top search results are commercial self-publishing services offering publishing packages and printing services.
Majority of top search results are commercial self-publishing services offering publishing packages and printing services.
Appendix 6. Medium-Fidelity Wireframes

1. HOME PAGE WIREFRAME

<table>
<thead>
<tr>
<th>MAIN MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOME</td>
</tr>
<tr>
<td>DESIGN &amp; PRODUCTION</td>
</tr>
<tr>
<td>MARKETING</td>
</tr>
<tr>
<td>BOOK TO LIBRARY</td>
</tr>
<tr>
<td>SEARCH</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HEADER</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESIGN &amp; PRODUCTION</td>
</tr>
<tr>
<td>MARKETING</td>
</tr>
<tr>
<td>TO-DO-LIST</td>
</tr>
</tbody>
</table>

- DESIGN & PRODUCTION:
  - COVER ART COLLECTION
  - DESIGN FEATURES
  - QUALITY CONTROL

- MARKETING:
  - DISTRIBUTION
  - SOCIAL MEDIA MARKETING
  - BLOGGING

- TO-DO-LIST:
  - LISTING TASKS OF VALUE
  - ISBN
  - BOOK TEMPLATES
  - E-BOOK TEMPLATE
  - FORMATS, MEASUREMENTS

<table>
<thead>
<tr>
<th>LIBRARY ACQUISITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>information about library acquisition</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LINK TO LIBRARY ACQUISITION PAGE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>LATEST ARTICLE</th>
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<tbody>
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</tbody>
</table>

CXLI
2. MAIN CATEGORY LANDING PAGE

HEADER OF MAIN CATEGORY

INTRODUCTION TO THE FEATURES AND CONTENT AVAILABLE RELATED TO THE CATEGORY

USER GOAL 1
USER GOAL 2
USER GOAL 3

GO TO PAGE
GO TO PAGE
GO TO PAGE
3. USER GOAL SUB-PAGE WIREFRAME

USER GOAL 1 HEADER

INTRODUCTION TO THE FEATURES AND CONTENT AVAILABLE RELATED TO THE USER GOAL

VALUE ADDING FEATURE CONTENT ARTICLE

QUICK TIP OR LINK TO USER GOAL / FEATURE

VALUE ADDING FEATURE CONTENT ARTICLE

QUICK TIP OR LINK TO USER GOAL / FEATURE

VALUE ADDING FEATURE CONTENT ARTICLE

QUICK TIP OR LINK TO USER GOAL / FEATURE

VALUE ADDING FEATURE CONTENT ARTICLE

QUICK TIP OR LINK TO USER GOAL / FEATURE

REPEAT ABOVE OR LINK TO OTHER USER GOAL
4. BOK-TILL-BIBLIOTEK WIREFRAME
Appendix 7. Visual Profile

1. VISUAL PROFILE

Focusing on the aesthetics and motivations behind decisions for the visual profile, more artistic freedom was applied to the design while following the minimalism and light-weight approach. Below are the various colours, icons and buttons used in the Publizebra prototype.

2. COLOUR PALETTE

![Colour Palette](image)

The palette used for Publizebra consists of warm and bright colours contrasting with darker hues to create contrast and improve readability as backdrop.

3. PUBLIZEBRA LOGO

![Logo](image)

Logo of Publizebra was made simple, minimalistic and modern with use of the colour palette. To summarize the concept of self-publishing through the use of an affordance or illustration was deemed difficult to capture in an expression without risk of confusing or misleading visitors to appear as a printing or commercial publishing service.
4. BUTTONS

Buttons with text are suitable according to Goodwin (2009) for immediate action upon clicking, and all buttons with text used on the prototype are used in such way without toggling or drop-down effects.

**PRIMARY BUTTONS** *(CALL TO ACTION ARROW)*

- OMSLAGSBILDER
- DISTRIBUTION

**SECONDARY BUTTONS**

- LÅS MER OM DESIGN
- LÅS ARTIKEL

**CONTRASTING BUTTONS** *(FOR SPECIAL ACTIONS & FEATURES)*

- TIPSA OM DIN BOK TILL BIBLIOTEK
- SKICKA DIN E-BOK TILL BIBLIOTEK
- BILDGALLERI
- Skicka till Bibliotek i Stockholm

**SECONDARY MENU BUTTON** *(ACTIVE)*

- OMSLAGSBILDER

**SECONDARY MENU BUTTON** *(INACTIVE)*

- OMSLAGSBILDER
WIDGET AND FEATURE BUTTONS (STACKED)

- **GRATIS OMSLAGSBILDER**
  Klicka här för att bläddra bland gratis bilder du kan använda hur du vill utan att tänka på copyright.

- **DESIGNMALL TILL BOK**
  Klicka här för att hämta en mall till omslag för en bunden eller häftad bok i standard storlek för böcker.

- **DESIGNMALL TILL E-BOK**
  Klicka här för att hämta en standardmall för omslag till e-böcker som fungerar till läsplattor, mobiler och datorer.

LIBRARY ACQUISITION REGION SELECTOR (PASSIVE)

- **STOCKHOLM**

LIBRARY ACQUISITION REGION SELECTOR (MOUSEOVER)

- **STOCKHOLM ↓**
5. ICONS

DESIGN & PRODUCTION ICONS
- Printed Book, Book Cover
- Design Tips
- Quality Control
- Cover Art Images
- E-Book

MARKETING ICONS
- Distribution, Sharing
- Social Media
- Blogging

MISCELLANEOUS ICONS
- Register ISBN (Call to Action)
- ISBN-Number
- Search
- Did-You-Know?
- Notice This