

Towards Inclusive Service Design in the Digital Society: Current Practices and Future Recommendations

Oda Lintho Bue¹, Miriam Eileen Nes Begnum¹

¹*Department of Design, Faculty of Architecture and Design, NTNU Norwegian University of Science and Technology, Teknologiveien 22, 2815 Gjøvik, Norway*

lintho.oda@gmail.com

miriam.begnum@ntnu.no

Abstract

The field of service design (SD) is fast growing. SD methodology focuses on ensuring positive user experiences across types of touch-points, types of mediums used (digital, paper, TV, radio etc.), devices (mobile, web), platforms (iOS, Android, MS, Linux), browsers, usage situations, weathers (rain, sunshine, cold weather) and so forth. However, universal design (UD) related to SD is under-researched. This paper aims to increase the knowledge of UD in SD. An exploratory approach is used to gather information, including a literature study and an interview study. Our findings show that UD awareness is lacking. Processes are highly qualitative – seeking to understand the user. However, marginalized users are not included. Based on the findings, we suggest six initiatives to promote a more inclusive SD methodology: 1) Define UD in relation to services, 2) Change the legislated focus from digital touchpoints to holistic customer journeys, 3) Make service designers accountable for UD aspects, 4) Add UD aspects in early design-up-front, 5) Promote marginalized user focus during design and 6) Integrate UD aspects in higher education on SD. Further, we propose the following definition of UD in SD: “*A service is universally designed when its customer journeys are usable to all people, to the greatest extent possible, without the need for adaptation or specialized design apart from choosing preferred touchpoints*”.

Keywords: *Universal design, Inclusive design, Service design, Legislation, Education, Methodology, User involvement, Disabled user groups, Digital exclusion*

1 Introduction

As products and services are becoming more integrated and complex, service designers are considered likely to heavily impact the shape and form of future eCommerce and eGovernment services (Scott, Delone & Golden, 2016). SD is as a design approach to make services user friendly, easy and intuitive (Curedale, 2013). It is a fairly new discipline, and does not yet have a clear definition, though there are many suggestions (Schneider et.al., 2012). As a general goal, UD aims to contribute to equal participation and gender equality in

the population, regardless of individual assumptions (Steinfeld & Maisel, 2012). A universally designed society aims at giving more people the opportunity to work, and decrease the need for specialized adaptations. One may predict the need for universally designed services is likely to grow, as it is estimated that by 2050 approximately 21% of the world population will be over 60 years old. In 1950, the number was 8% (Keates, 2015). With higher age, many different challenges and needs can occur for the mainstream population (John Clarkson & Coleman, 2015; Keates, 2015). However, the inclusion of UD aspects in SD is unclear. Santana et al. reports UD is absent in SD literature, (2017).

This paper investigates how we can move towards inclusive SD. We ask:

1) To what degree is there UD awareness in current SD methodology and practice?

2) In what ways can findings contribute to strengthen the awareness of UD in the field of SD?

The contribution and audience of the paper is two-fold; 1) an academic contribution to strengthen the body of knowledge on the status of UD practice within SD and 2) proposing ways this knowledge can be utilized to improve the UD quality of SD practice. The structure of the paper is as follows: In Section 2, we view the current status of the field. Section 3 outlines our research approach and Section 4 our findings. In Section 5 we discuss and answer our research questions. Finally, Section 6 concludes and suggests future work.

2 Background

SD emerged as a design profession around 2000 (Sangiorgi & Prendiville, 2014). The essence of SD is the merge of digital, intangible and physical touchpoints to form a holistic customer journey experience, taking into account both provider, technological potentials, users behavior and attitudes towards the service (Polaine, Løvlie & Reason, 2013; Reim, Parida & Örtqvist, 2015). Nordic countries are increasingly utilizing service digitalization, and SD is as such a fast-growing design discipline (Chakravorti, 2017; Rosenzweig, 2015). Service designers are involved in private, public and business service creation, administration and digitalization (Kuk & Janssen, 2013; Steen, Manschot & Koning, 2011). Norway is a leading country when it comes to the use of SD in public sector, as well as digitalization in society (AHO, 2016). Patrício, Fisk, Falcão e Cunha and Constantine express the need for more research on SD (2011), as it is still a young discipline.

UD is the design of products and environments to be usable to all people, to the greatest extent possible (Law, Yi, Choi & Jacko, 2008). UD and inclusive design is often referred to as synonymous principles (John Clarkson & Coleman, 2015; Goodman-Deane, Langdon & Clarkson, 2010; Wilkinson & De Angeli, 2014). When designing for a wide population, one creates services and product easier to use for everyone. UD can be viewed as a necessity for someone, but an advantage for everybody (Rotvik, 2014). Currently, both public sector and private businesses that target the public offering ICT-based solutions to the Norwegian public are obligated to ensure that these are universally designed (BLD, 2016; BLD, 2011). Current legislation regarding UD is focused on Web Content Accessibility Guidelines (WCAG). WCAG is a set of guidelines to help make web content available for as many users as possible, including people with disabilities such as blind, deafness, learning disabilities, cognitive limitations, speech disabilities and so on (W3C, 2008). Norwegian regulations specify WCAG 2.0 must be followed for all digital touchpoints – such as web services and app's (KMD, 2013). However, even though technical accessibility guidelines are followed, there can still be needs and barriers that are not covered. UD thus needs to be more than a list

of criteria (Johnsen, 2017). Other sets of UD legislation relevant for service designers are those related to buildings, environments, transport and self-service automats.

Service experiences have changed in recent years with new and advanced technology (Ostrom et al., 2015). Some authors claim that customer service experiences will become increasingly important to separate one provider from another, and to add customer value (Patrício et al., 2008). Customer experience encompasses several aspects of a company, and service designers acknowledge this importance when designing services (Teixeira et al., 2012). If people feel included and well taken care of the chances that they return as customers are high (Vandermerwe & Rada, 1988). As positive effects of inclusive services are not only limited to the individual and his/her families but extends to the society, UD may increase business for companies in terms of a wider customer base (John Clarkson & Coleman, 2015). Users are commonly included in the SD process (Schneider et al., 2012). With technical support, services can also make a customer a co-creator in real time, and tailor the service and adapt to customer needs over time (Patrício, Fisk & Falcão e Cunha, 2008).

3 Research Approach

Our overall research approach is exploratory and qualitative (Marshall & Rossman 2011; Merriam, 2009). We explore practices currently established in SD in a literature study, including the degree of inclusive aspects, UD awareness and types of users receiving focus. As Merriam notes, qualitative research is typically focused on aspects such as understanding how people interpret their experiences (Merriam, 2009, p. 5), which is the focus of our interview study (Lazar, Feng & Hochheiser, 2010, p. 181). The literature study and interviews are conducted and analyzed iteratively and in parallel to answer our research questions.

3.1 Literature Study

NTNU's Oria library is used to search databases in the category "design", where 15 databases are identified. Since UD emerged around 2000, the search was limited to year 2000 and forward. We combine "newness" (updated knowledge, thus relevant) with "impact" (utilized knowledge, thus relevant) by including articles cited by 45 or more. This limited us to databases that could sort by citation; ACM Digital Library, Scopus and Web of Science. 175 articles were screened for relevance, using the inclusion criteria: a) the work is within or about SD, and b) the work reports on SD practice (and not just theoretical discussions).

Table 1. Search Results and Screening Results.

Database	Search	Results	> 45 citations	Included
ACM Dig. Lib.	"service design" in proceedings (7.12.2017)	224	4	0
	"service design" in journals (7.12.2017)	7	0	0
Web of Science	"service design" in all articles (17.11.17)	718	28	3
Scopus	"service design" in all articles (21.11.17)	2466	163	13 (10 new)
Total		3415	175	13

As Table 1 shows, search results from the databases overlap. As Scopus returned all the included articles, and had, overall, the most citations, citation counts from Scopus become the standard count. Note that ACM returned 290 results, but could not be limited to “articles”. We chose to screen “ACM proceedings” and “ACM journals” only – excluding magazines and newsletters. After screening, our included article sample consists of 13 articles (see Table 2).

Table 2. Articles Included in the Literature Study Sample.

Article	Citations
1. Service Design for Experience-Centric Services (Zomerdijk & Voss, 2009)	207
2. Key strategies for the successful involvement of customers in the co-creation of new technology-based services (Kristensson, Matthing, & Johansson, 2008)	154
3. Designing Multi-Interface Service Experiences (Patrício et al., 2008)	124
4. Multilevel Service Design: From Customer Value Constellation to Service Experience Blueprinting (Patrício et al., 2011)	110
5. Toward an integrative approach to designing service experiences Lessons learned from the theatre (Stuart & Tax, 2004)	73
6. Field trial of Tiraisu: crowd-sourcing bus arrival times to spur co-design (Zimmerman et al., 2011)	66
7. Customer experience modeling: from customer experience to service design (Teixeira et al., 2012)	61
8. Strategies for designing and developing services for manufacturing firms (Tan, Matzen, McAloone, & Evans, 2010)	60
9. A Qualitative Cross-National Study of Cultural Influences on Mobile Data Service Design (Choi, Lee, Kim, & Jeon, 2005)	54
10. Designing for Service as One Way of Designing Services (Kimbell & Kimbell, 2011)	52
11. Understanding service experience in non-profit performing arts: Implications for operations and service management (Hume, Sullivan Mort, Liesch, & Winzar, 2006)	49
12. Managing User Involvement in Service Innovation (Magnusson, Matthing, & Kristensson, 2016)	48
13. Requirements engineering for e-Government services: A citizen-centric approach and case study (van Velsen, van der Geest, ter Hedde, & Derks, 2009)	47

Included articles were read multiple times to map the following topics; 1) methods used, 2) overall design approach, 3) user groups involved and focus on marginalized users, and 4) whether inclusive design or UD is mentioned or reflected upon. All articles were searched for the words: impairment, handicap, disabled, blind, deaf, wheelchair, special need and cognitive. Further, summarized information and other relevant information was extracted, including which service areas and topics are commonly repeated through many of the articles.

3.2 Exploratory Interviews

The interviews are semi-structured (Lazar et al., 2010). Table 3 overviews the focus of the 17 questions in the interview guide and type of data collected. To identify potential biases (Lazar et al., 2010) a pilot test was conducted prior to interviews. The only inclusion criterion for informants is that they work as service designers. Convenience sampling via e-mail was used, approaching 13 companies. The companies then forwarded the email to appropriate

candidates. Audio recording is used, in 60 minutes one-on-one interviews. Free and informed consent was given, and interviews were transcribed and anonymized continuously to ensure the privacy of the informants (Torp, 2016). Transcribed material was transferred to NVivo for emergent coding, as we had no established theories (Lazar et al., 2010).. An inductive approach was used to analyze, without the purpose of generalization. The texts were read several times to identify themes that emerge from the data, supported by the audio files.

Table 3. Interview Guide Overview.

	Interview focus	Question	Data
Research Question 1	Self-rated service- and UD competence.	3,4	Quantitative
	How is UD included in current practice.	5,6	Qualitative
	Methods and processes utilized in current practice.	10,11,12	Both
	Which users are involved (if any) and how.	13,14,15	Both
Research Question 2	Ideal manner to do UD in service design	7	Qualitative
	What promotes UD in service design	8	Qualitative
	What obstructs UD in service design	9	Qualitative
	Background, age, workplace, title, experience	1,2,16,17	Both

4 Results

4.1 Literature Study

The literature study paints the most positive picture of the degree of awareness on UD, with 23% mentioning catering to users with special needs: Kristensson et al. (2008), van Velsen et al. (2009) and Zimmerman et al. (2011). Still, 77 % do not mention special needs, disabled or marginalized users and none of the articles emphasize inclusive aspects or use the terms universal- or inclusive design. Process approaches are overall qualitative, and user centered, with eight of the 13 articles mentioning co-creating as a design strategy (61 %). Only Velsen et al. (2009) includes marginalized users, since their general target users have special needs.

4.2 Interview Study

We initially intended to recruit 15 informants; however few new insights were made after the initial three interviews. The main reason is assumed to be our limited understanding of the SD field to adequately define the right sub-population to sample. We thus ended the interviews after talking to five informants. None of our informants focus on UD in their daily work, and their UD self-rating is mediocre (3.1 average on scale from 1-7). They all work on projects that target the public, and focus on understanding user needs – however marginalized user focus is lacking. When questioning the service designers on their focus on marginalized users, all the informants seemed to experience discomfort. They all stress user inclusion must be determined based on the project. No one focuses on recruiting marginalized user groups for edge-case design strategies. Thus, discomfort could understandably be related to recognizing their own lack of focus on marginalized users. Still, the results on this item should be analyzed with care due to the input from the informants on relevance.

Two informants mention that UD focus sometimes comes late in the projects, and can therefore be annoying, as they need to adjust design as a result of not including it from the

beginning. Methods utilized in SD project seem to be selected dependent on specific project's aims, and informants have freedom to choose the approach and methods they consider most sufficient within resource limitation. Inputs from users are highly appreciated: *"We work very much with including the end user. I usually say that they are the material of a designer - to have an end user and understand the end-user's needs."* (Informant 2).

Table 4. Informants.

Informant	Title	Age	Experience	Workplace
1	Senior Designer	30-39	6 years	Company 1: Large Consultancy
2	Senior Designer	< 30	5 years	Company 1: Large Consultancy
3	Service Designer	< 30	2 years	Company 2: Large Banking Service
4	Service Designer	< 30	< 1 year	Company 3: Large Consultancy
5	Designer	< 30	5 years	Company 4: Medium Consultancy

Our findings indicate UD is not part of current practice, however four of five express a positive attitude to guidance for inclusive services. They would appreciate a clearer definition of UD within SD, more knowledge on how to ensure inclusiveness in their work, and increased resources to do UD. Three informants state UD should be addressed in SD education. Two of the informants who work as consultants mention that their service providers (customers) also need education on the importance of UD. One informant explains that the services or results they deliver generally do not get measured with regards to *any* quality aspects, including UD, and that often they don't know if what they deliver is implemented or not, or how well it is received. All informants are explicit on the fact that UD is not a priority. Although the degree to which they thought UD is their responsibility varied, all informants had ideas about what needs to be done to increase the awareness of UD in SD.

5 Discussion

Both the interview and the literature study show service designers seek to understand users, and work hard to make useful services. However, UD awareness is lacking. Marginalized user groups, including edge-case users within the target group, do not receive focus. This is backed by Santana et.al. (2017, p. 22), who states that "Traditional service design process models are not oriented towards addressing the needs of people with disabilities (...)". As such, our hypothesis is that inclusive aspects are generally not embedded in SD methodology. We propose 6 strategies to promote UD, presented in 5.1-5.6 and visualized in Figure 3.

5.1 Define Universal Design in Service Design Methodology

All informants ask for a clear definition of UD in SD. We believe a clear definition of UD in SD would be beneficial, and propose the following: *"A service is universally designed when its customer journeys are usable to all people, to the greatest extent possible, without the need for adaptation or specialized design apart from choosing preferred touchpoints"*. Not all touchpoints needs to be available to all users, but all users must be able to use the service.

5.2 Increasing Focus through Legislation

The importance of UD is clearly argued for, both from socio-economical and personal needs (BLD, 2016; NHF, 2016). However, the current focus in UD legislation is on specific ICT- or physical *touchpoints* within services. We believe focus on the *whole* customer journey would better ensure key customer journeys offered by service providers are accessible to all.

5.3 Service Designer Responsibility

As van Velsen et al. (2009) mention, a team need to have people that are experts in their field. Harder and Begnum (2017) discovered through their study that it is uncommon to address UD as someone's main discipline, and propose instead to regard UD expertise as added competence within the different team members skillsets. The low UD awareness among in SD is unfortunate as service designers have the holistic view, paying attention to service context, users and provider (Polaine, Løvlie & Reason, 2013). We suggest that service designers could have the overall responsibility for ensuring universally designed services, using our proposed definition. This means the service designer understands and decides the level of UD necessary in each touchpoint for the service to be inclusive overall.

5.4 Inclusive Design Up-Front

If UD is included from the start, the need for redesign later, which is far more costly and time consuming, will be reduced (Sánchez-Gordón and L. Moreno, 2013 and Horton and Sloan, 2014 in Halbach and Fuglerud, 2016). All informants use some kind of "design up-front"-ish approach to map out the service with all the touchpoints, e.g. blueprint. We believe there is a need to update SD methodology to include inclusive aspects in early mapping and planning.

5.5 Marginalized Users in Focus

Methods and processes identified both from literature and industry practices have a high degree of end-user inclusion. However, all informants and all articles have used non-disabled users from their target groups. There is a lack of focus and attention on including people with special needs, and a lack of checkpoints that address different special needs. Harder and Begnum (2017) identifies focus on users with disabilities early and throughout the design process as one characterizing factor for ICT-projects successful in UD. Informants say that they often wish to get users with a greater variety of demographic, for example age and gender. We believe a change of practice towards directly involving marginalized and disabled users to a larger degree would significantly aid in creating more inclusive SD projects. Informants ask for checklist tools or similar to aid in remembering to include special needs from marginalized user groups.

5.6 Knowledge and Education

None of the informants had learned about UD in SD through their studies, or any industry training. More UD in SD education is needed.

5.7 Limitations of the Study

It is common for qualitative research to study a small sample in depth. This makes it difficult to prove findings can be generalized (Leedy & Ormrod, 2012; Shenton, 2004). When few new insights were made, interviews were ended, as they were considered sufficient for revealing insights at this stage in time. Internal validity is strengthened through audio recordings. However, generally, one would expect a higher number of informants to secure external validity. Also, in some cases interview information might not match what is actually being done, something a case study could help reveal (Leedy & Ormrod, 2012). Further, the literature search returned 3415 results, however only 13 articles were included in the final sample. With an improved search approach, less time could have been spent on screening irrelevant articles that could instead have been utilized to read a larger literature sample. Hindsight also shows it could have been better to focus on “newness” over “impact”. As SD is an emerging field, our cut-off at 45 citations may be problematic, as new and relevant studies does not necessary have this citation count yet.



Figure 3. Proposed Strategies to Promote Inclusive Service Design Practices.

6 Conclusion

This paper investigates the degree of awareness of UD in current SD practices. Through a literature survey and an interview study we find that UD awareness is severely lacking. We identify challenges related to knowledge, responsibility and methodology. We believe updating SD methodology to better support UD should be the next steps – ensuring flexible, sensitive and inclusive services, and further that a clear definition of UD for service designers would be a major contribution to raising awareness. Based on the findings, we propose a) a course of actions in order to promote awareness of UD in the field of SD, b) a possible definition of UD in SD. First, we suggest 6 action points: 1) Create a *definition* of UD in SD, 2) Legislate inclusive service *chains*, not only accessible touchpoints, 3) Give service designers the overall *responsibility* to consider UD and inclusiveness across the service chain, 4) ensure focus on UD in early SD methodology, 5) increase involvement of *marginalized* user group, and 6) increase UD focus in SD *education*. Second, we propose the following definition of a universally designed service: “A service is universally designed when its customer journeys are usable to all people, to the greatest extent possible, without the need for adaptation or specialized design apart from choosing preferred touchpoints”.

Acknowledgement

We would like to thank everyone that has participated in the interview study.

References

- AHO. (2016). *Norge på topp i tjenstedesign (Norway is on top in the field of service design)*. [online] <https://aho.no/no/nyhetsarkiv/norge-p-topp-i-tjenstedesign>
- BLD (Ministry of Children and Equality). (2017). *LOV-2017-12-19-115 Universell utforming i diskriminerings- og tilgjengelighetsloven*. Regjeringen.no
- BLD (Ministry of Children and Equality). (2016). *Regjeringens handlingsplan for universell utforming, 2015-2019*. Regjeringen.no
- Chakravorti, B. & Chaturvedi, S. R. (2017). *Digital Planet 2017, How Competitiveness And Trust in Digital Economies Vary Across The World*. The Fletcher School, Tufts University. https://sites.tufts.edu/digitalplanet/files/2017/05/Digital_Planet_2017_FINAL.pdf.
- Choi, B., Lee, I., Kim, J., & Jeon, Y. (2005). *A qualitative cross-national study of cultural influences on mobile data service design*, CHI'05 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Portland, Oregon, US, April 2-7, 661-670. doi:10.1145/1054972.1055064
- Curedale, R. A. (2013). *Service design: 250 essential methods*. Los Angeles, USA: Design Community College Inc. ISBN 978-0-9892468-6-6
- Goodman-Deane, J., Langdon, P. & Clarkson, J. (2010). Key influences on the user-centred design process. *Journal of Engineering Design*, 21(2-3), 345-373. doi:10.1080/09544820903364912
- Halbach, T. & Fuglerud, K. S. (2016) On Assessing the Costs and Benefits of Universal Design of ICT, *Universal Design 2016: Learning from the Past, Designing for the Future in H. Petrie et al. (Eds.) Stud Health Technol Inform.* 229, 662-72.
- Harder, S. K. & Begnum, M. (2016). *Promoting and Obstructing Factors for Successful Universal Design*, Norsk konferanse for organisasjoners bruk av IT (NOKOBIT), Bergen, Norway, Open Journal Systems, 24(1), November 28-30. ISSN 1894-7719
- Hume, M., Sullivan Mort, G., Liesch, P. W. & Winzar, H. (2006). Understanding service experience in non-profit performing arts: Implications for operations and service management. *Journal of Operations Management*, 24(4), 304-324. doi:10.1016/j.jom.2005.06.002
- Clarkson, J. P. & Coleman, R. (2015). History of Inclusive Design in the UK. *Applied Ergonomics*, 46, 235-247. doi:10.1016/j.apergo.2013.03.002
- Johnsen, I. T. (2017, 20. april 2017). Universell utforming må bli mer enn en liste med krav [online] <https://www.kjokkenfesten.no/2017/04/20/universell-utforming-liste-krav/>
- Keates, S. (2015). Design for the value of inclusiveness *Handbook of Ethics, Values, and Technological Design*, 383-402, Springer: Dordrecht.
- Kimbell, L. (2011). Designing for Service as One Way of Designing Services. *International Journal of Design*, 5(2), np.
- Kristensson, P., Matthing, J. & Johansson, N. (2008). Key strategies for the successful involvement of customers in the co-creation of new technology-based services. *International Journal of Service Industry Management*, 19(4), 474-491.
- KMD (Norwegian Ministry of Local Government and Modernisation). (2013) *FOR-2017-09-13-1417 Forskrift om universell utforming av informasjons- og kommunikasjonsteknologiske (IKR)-løsninger*. Lovdata.

- Kuk, G. & Janssen, M. (2013). Assembling infrastructures and business models for service design and innovation. *Information Systems Journal*, 23(5), 445-469. doi:10.1111/j.1365-2575.2012.00418.x
- Law, C., Yi, J., Choi, Y. & Jacko, J. (2008). A systematic examination of universal design resources: part 1, heuristic evaluation. *International Journal*, 7(1), 31-54. doi:10.1007/s10209-007-0100-1
- Lazar, J., Feng, J. H. & Hochheiser, H. (2010). *Research methods in human-computer interaction*. Chichester, UK: John Wiley.
- Leedy, P. D., & Ormrod, J. E. (2012). *Practical research : planning and design* (10th ed. ed.). Boston, US: Pearson Educational.
- Magnusson, P. R., Matthing, J. & Kristensson, P. (2016). Managing User Involvement in Service Innovation. *Journal of Service Research*, 6(2), 111-124. doi:10.1177/1094670503257028
- Marshall, C. & Rossman, G. B. (2011). *Designing qualitative research* (5th ed.). Los Angeles, US: Sage.
- Merriam, S. B. (2009). *Qualitative research : a guide to design and implementation* (3rd ed.). San Francisco, California, US: Jossey-Bass.
- Ostrom, A. L., Parasuraman, A., Bowen, D. E., Patrício, L., Voss, C. A. & Lemon, K. (2015). Service Research Priorities in a Rapidly Changing Context. *Journal of Service Research*, 18(2), 127-159. doi:10.1177/1094670515576315
- Patrício, L., Fisk, R. P. & Falcão e Cunha, J. (2008). Designing Multi-Interface Service Experiences. *Journal of Service Research*, 10(4), 318-334. doi:10.1177/1094670508314264
- Patrício, L., Fisk, R. P., Falcão e Cunha, J. & Constantine, L. (2011). Multilevel Service Design: From Customer Value Constellation to Service Experience Blueprinting. *Journal of Service Research*, 14(2), 180-200. doi:10.1177/1094670511401901
- Polaine, A., Løvlie, L. & Reason, B. (2013). *Service design : from insight to implementation*. Brooklyn, N.Y, US: Rosenfeld Media.
- Reim, W., Parida, V. & Örtqvist, D. (2015). Product–Service Systems (PSS) business models and tactics – a systematic literature review. *Journal of Cleaner Production*, 97, 61-75. doi:10.1016/j.jclepro.2014.07.003
- Rotvik, I. M. (2014). Universell utforming - nødvendig for noen, nyttig for alle. [online] <http://www.helsebiblioteket.no/samfunnsmedisin-og-folkehelse/aktuelt/universell-utforming-nodvendig-for-noen-nyttig-for-alle>
- Sangiorgi, D. & Prendiville, A. (2014). A Theoretical Framework for Studying Service Design Practices: First Steps to a Mature Field. *Design Management Journal*, 9(1), 61-73. doi:10.1111/dmj.12014
- Santana, F. E., Cardoso, C. C., Ferreira, M. G. G., Catapan, M. F., Montanha, I. R. & Forcellini, F. A. (2018). Towards a more inclusive service development process for the wider population. *Design Studies*, 55, 146-173.
- Schneider, J., Stickdorn, M., Bisset, F., Andrews, K. & Lawrence, A. (2012). *This is service design thinking: basics - tools - cases*. Amsterdam, Netherlands: BIS Publishers.
- Scott, M., Delone, W. & Golden, W. (2016). Measuring eGovernment success: a public value approach. *European Journal of Information Systems*, 25(3), 187-208. doi:10.1057/ejis.2015.11
- Shenton, A. K. (2004). Strategies for Ensuring Trustworthiness in Qualitative Research Projects. *Education for Information*, 22(2), 63-75.
- Steen, M., Manschot, M., & Koning, N. (2011). Benefits of Co-design in Service Design Projects. *International Journal of Design*, 5(2), n/a.
- Steinfeld, E. & Maisel, J. (2012). *Universal Design*. Hoboken, NJ, US: John Wiley & Sons

- Stuart, F. I., & Tax, S. (2004). Toward an integrative approach to designing service experiences. *Journal of Operations Management*, 22(6), 609-627. doi:10.1016/j.jom.2004.07.002
- Rosenzweig, E. (2015). *Successful User Experience: Strategies and Roadmaps*, Chapter 12 Service Design, 245-266 Waltham, MA, USA: Morgan Kauffman.
- Tan, A. R., Matzen, D., McAloone, T. C. & Evans, S. (2010). Strategies for designing and developing services for manufacturing firms. *CIRP Journal of Manufacturing Science and Technology*, 3(2), 90-97. doi:10.1016/j.cirpj.2010.01.001
- Teixeira, J., Verma, R., Patrício, L., Nunes, N. J., Nóbrega, L., Fisk, R. P. & Constantine, L. (2012). Customer experience modeling: from customer experience to service design. *Journal of Service Management*, 23(3), 362-376. doi:10.1108/09564231211248453
- Torp, I. S. (2016). Forskningsetiske retningslinjer for naturvitenskap og teknologi. [online] <https://www.etikkom.no/forskningsetiske-retningslinjer/naturvitenskap-og-teknologi/Sammendrag/>
- van Velsen, L., van der Geest, T., ter Hedde, M. & Derks, W. (2009). Requirements engineering for e-Government services: A citizen-centric approach and case study. *Government Information Quarterly*, 26(3), 477-486. doi:10.1016/j.giq.2009.02.007
- Vandermerwe, S. & Rada, J. (1988). Servitization of business: Adding value by adding services. *European Management Journal*, 6(4), 314-324. doi:10.1016/0263-2373(88)90033-3
- W3C. (2008). Web Content Accessibility Guidelines (WCAG) 2.0. [online] <https://www.w3.org/TR/WCAG20/>
- Wilkinson, C. R. & De Angeli, A. (2014). Applying user centred and participatory design approaches to commercial product development. *Design Studies*, 35(6), 614-631. doi:10.1016/j.destud.2014.06.001
- Zimmerman, J., Tomasic, A., Garrod, C., Yoo, D., Hiruncharoenvate, C., Aziz, R., Thiruvengadam, N. R., Huang, Y. & Steinfeld, A. (2011). Field trial of Tiramisu: crowd-sourcing bus arrival times to spur co-design, CHI '11 Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, 1677-1686. doi:10.1145/1978942.1979187
- Zomerdijs, L. G. & Voss, C. A. (2009). Service Design for Experience-Centric Services. *Journal of Service Research*, 13(1), 67-82. doi:10.1177/1094670509351960