Exploring the Role of Service Design in Software Development: A Systematic Mapping

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Abstract: As digital services gain prominence in our society, service design has become a valuable approach for supporting the development of complex software applications that interact with multiple stakeholders. This paper presents a systematic mapping study to offer an overview of the literature regarding the use of the service design approach in driving software development. We analyzed 30 papers focusing on the utilization of service design techniques, along with its benefits. Our findings show a wide range of references to service design, but few focus on the process itself; most only mention the approach. Service design, as our analysis highlights, bridges communication gaps in projects and ensures user needs are fully met. We compiled methodologies and techniques commonly used in the service design process. In conclusion, applying service design to guide software development is an unexplored approach with significant potential. The literature gap highlights the need for further research to explore its implications and benefits.

1 INTRODUCTION

A key objective of Service Design (SD) is to foster communication among stakeholders, users, and developers by establishing a common language. SD has successfully introduced a human-centered perspective across various business sectors (Leinonen and Roto, 2023). However, its diverse origins create ambiguity around its concepts and methodologies. (Lee et al., 2022) emphasize the need for multidisciplinary studies spanning SD, computer science, social sciences, and business. (Leinonen and Roto, 2023) argue that a holistic view of service creation projects clarifies SD's impact on software development, which integrates Agile UX activities, implementation, and commercialization.

This study explores how SD principles can enhance software development practices, identifying current industry methods and techniques, analyzing the benefits of SD adoption.To this end, we conducted a systematic mapping of the literature following the framework of (Petersen et al., 2008). Through a rigorous selection process, we examined 30 primary studies, concluding that SD acts as a bridge between users and software implementation. Our findings also reveal a lack of empirical studies in the area, highlighting its potential as a promising avenue for future research.

2 BACKGROUND

SD is grounded in the principles of design thinking, thus offering improvements for services and their projects through a creative process that is centered on human needs (Stickdorn et al., 2019). Moreover, SD is not only concerned with the experiences of end users but also with the experiences of various stakeholders and intermediaries within a service network (Roto et al., 2018).

As discussed by (Forlizzi and Zimmerman, 2013), SD transcends the traditional concept of design focused exclusively on products, embracing a more holistic approach that considers the entire ecology of interactions, relationships, and experiences that comprise a service system. SD elevates the software development process beyond the creation of functional interfaces (Forlizzi and Zimmerman, 2013), providing a framework to tackle complex challenges in technological systems and meet the increasing expectations of users and stakeholders (Trischler and West-

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man Trischler, 2022).

The work of (Yoo et al.,) expands this view by discussing how SD, within the field of HCI, promotes value co-creation, not just delivering a service, but facilitating an ecosystem where users actively shape the service experience. This aspect is vital for software development, as it recognizes users not just as end consumers but as active participants in the development process.

In summary, SD guides software development by emphasizing the importance of aligning user needs with technical capabilities, promoting a user-centered approach. Through this integration, organizations can create more resilient, adaptable, and user-centered solutions that effectively meet market demands and stakeholder expectations.

3 RESEARCH METHODS

Following the framework proposed by (Petersen et al., 2008), our systematic mapping approach was structured into three distinct phases: (1) Definition; (2) Search; and (3) Selection.

3.1 Definition

To initiate our investigation, we provided an overview of our research area by articulating four research questions:

- RQ1. How does SD guide software development?
- RQ2. Which methods and techniques of SD are currently employed in software development?
- RQ3. What are the advantages associated with the implementation of SD in the software development process?

Our search string was constructed by combining the two main keywords (“Software Development” and “Service Design”). With the synonyms considered, the resulting search string was (”Software Development” OR ”Software Design” OR ”Software Engineering” OR ”Software Industry” OR ”Software Process” OR ”Software Project” OR ”Software Implementation”) AND (”Service Design”).

We formulated inclusion and exclusion criteria to exclude papers that weren’t relevant to the study (see Table 1).

3.2 Search

We applied the search string across five scientific databases: ACM Digital Library, IEEE Xplore, ScienceDirect, Scopus, and ISI Web of Science. All searches were conducted in August 2023, yielding a total of 393 papers.

Table 1: Inclusion and exclusion criteria.

ID	Description
IC1	Papers concerning SD in software development
EC1	Duplicated papers
EC2	Papers where service is not associated with the user
EC3	Papers unavailable for download
EC4	Papers not written in English
EC5	Papers devoid of discussion on SD in software development
EC6	Papers lacking peer review

Figure 1 illustrates the distribution of articles retrieved from each database, thereby elucidating the search process and subsequent selection of pertinent literature.

3.3 Selection

After conducting the search in the databases, the selected articles underwent a selection process for inclusion in our systematic mapping. This involved four stages of filtering, outlined in Figure 1.

- Step 1: Initial screening based on title, abstract and keywords.
- Step 2: Evaluation of agreement using the Kappa coefficient.
- Step 3: Reading of the full text.
- Step 4: In-depth study of the selected articles.

To start the filtering process of the identified papers, two researchers scrutinized their titles, abstracts, and keywords. Duplicates were removed.

Cohen’s Kappa Coefficient (Pérez et al., 2020) was used to measure agreement among researchers. Based on evaluations of 393 papers, the Kappa coefficient showed a 68.75% agreement rate, with consensus on 304 papers and disagreements on 89. Discrepancies were resolved through online discussions, resulting in consensus-based decisions. In the end, 185 papers were accepted, and 208 were rejected.

In the third step, researchers examined the full texts of 185 papers, evenly dividing the workload. After review, 140 papers were rejected, an exclusion rate of about 75.67%. This process left 45 papers for further study, each undergoing a detailed review by the assigned researchers.

Then, a thorough examination was carried out, leading to the exclusion of an additional 15 papers

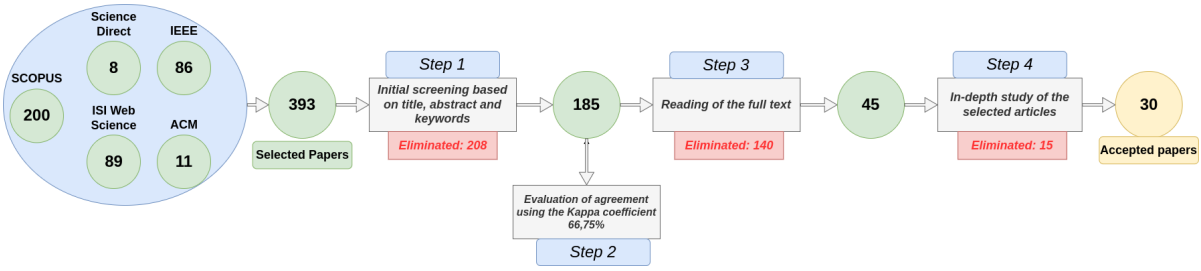

Figure 1: Paper selection process.

deemed irrelevant to this research. Therefore, 30 articles remained, which were selected for detailed analysis and study.

4 RESULTS

Table 2 showcases the 30 accepted papers identified in our literature review, featuring each paper's ID, title and authors. Subsequently, the paper's ID was used in Table 3 for cross-referencing in other analyses.

Table 3 presents a classification into empirical and non-empirical research (Cruzes and Dybå, 2010). The non-empirical category encompasses theoretical papers, defined as those lacking practical application discussions (Parizi et al., 2022). The empirical papers were divided into three categories (Parizi et al., 2022):

- Industry: the paper was developed within the framework of a company or industrial setting;
- Academic: the paper was developed within the context of a university or course;
- Innovation: the paper employed a novel approach aimed at fostering social innovation.

4.1 RQ1: How SD Guides Software Development

SD is usually portrayed as a bridge connecting the user needs with software implementation. This concept of SD was employed by (Tuunanen and Przybilski, 2014). It serves as a link between elicited requirements from target users and the technical implementation of the software. Therefore, software development is guided by SD, both ensuring that user needs are fully met throughout the technical implementation process and closely adhering to initial requirements (Lytras and Sicilia, 2009).

As described by (Patricio et al., 2004), SD goes beyond mere software functionality by incorporating subjective perceptions and user interactions with the service. This suggests that software development entails more than just adding features; it requires the creation of interfaces that offer a positive and personalized experience for customers across various service platforms (Chatley et al., 2023). SD broadens requirement acquisition techniques to encompass emotional aspects, emphasizing coherence among touch points in crafting an agile solution (Maiden, 2010).

In this manner, SD emerges as a guiding force in software development, adopting an integrated approach that combines service management, Human-Computer Interaction (HCI), and software engineering (Patrício et al., 2008). As articulated by (Tuunanen and Przybilski, 2014), SD not only translates user requirements into technical language but also offers strategic direction, aiding developers in navigating complex challenges, enhancing user experience, and facilitating informed decision-making throughout the software development lifecycle.

4.2 RQ2: SD Methods and Techniques Employed in Software Development

Table 4 shows the list of the most relevant tools and methods, focusing on those that appeared in multiple studies. These tools and methods allow for a better understanding of the user needs and helps guide the software development process.

Prototyping was the most mentioned tool. It plays a role in validating projects and/or collecting user feedback for improvement. (Leinonen and Roto, 2023) highlight that prototypes serve to communicate service features to development teams and can be processed into product backlog items. Additionally, (Chatley et al., 2023) stated the use of prototypes across various stages of the project development, including the usability, desirability, and functionality assessments. The prototypes were primarily developed by prioritizing specific requirements (Villa-García et al., 2022). According to (Tuunanen and Przybilski, 2014), a functional prototype allows users to effectively assess the collected requirements. Finally, (Villa-García et al., 2022) describes the pro-

Table 2: Papers Selected.

ID	Title	Ref	RQ1	RQ2	RQ3
01	A dimensional model of service design	(Yamakami, 2017)	✓		
02	A Proposition for a Design Method of Service Systems	(Kostova, 2018)	✓	✓	
03	A service-based innovation process for improving cooperative practices in AEC	(Kubicki et al., 2009)	✓	✓	
04	A Study on the Improvement of User-centered Public Service	(Lee et al., 2021)	✓	✓	✓
05	An agile model-based framework for service innovation for the future internet	(Berre, 2012)	✓	✓	✓
06	Can we know upfront how to prioritize quality requirements?	(Condori-Fernandez and Lago, 2015)	✓	✓	✓
07	Customer experience requirements for multi-platform service interaction: Bringing services marketing to the elicitation of user requirements	(Patricio et al., 2004)	✓	✓	✓
08	Design and Research of Mobile Assisted Medical System Intervention in the Elderly Community: A Case Study	(Zhiming et al., 2021)	✓	✓	✓
09	Designing for Real People: Teaching Agility through User-Centric Service Design	(Chatley et al., 2023)	✓	✓	
10	Designing multi-interface service experiences: The service experience blueprint	(Patrício et al., 2008)	✓	✓	✓
11	Designing new software-included service system: Methodology and operational tools	(Zhang Li et al., 2009)	✓	✓	
12	Domain specific case tool for ICT-enabled service design	(Tuunanen and Przybilski, 2014)	✓	✓	
13	Empower a team's product vision with lego® serious play®	(Pichlis et al., 2015)	✓	✓	✓
14	Ethical by design - A manifesto	(Mulvenna et al., 2017)		✓	
15	Hospital volunteer management process digitalization through service design: Design decision and implementation	(Wongpinkaew et al., 2021)	✓	✓	
16	In Search of Coproduction: Smart Services as Reciprocal Activities	(Carroll et al., 2016)	✓	✓	
17	Is designing independent of domain? Comparing models of engineering, software and service design	(Kannengiesser and Gero, 2015)		✓	
18	Model-based tool support for Service Design	(Pérez-Blanco et al., 2020)	✓	✓	✓
19	Pragmatic web service design: An agile approach with the service responsibility and interaction design method	(Millard et al., 2009)	✓	✓	
20	Service Design Handover to user experience design – a systematic literature review	L(Leinonen and Roto, 2023)		✓	
21	Service Design: It's All in the Brand	(Maiden, 2010)		✓	
22	Service feature modeling: modeling and participatory ranking of service design alternatives	(Wittern and Zirpins, 2016)		✓	
23	Software process as a service? Bridging service design and the software process	(Lytras and Sicilia, 2009)	✓	✓	
24	Supporting service design decisions	(Gebhart et al., 2010)	✓	✓	
25	Telecommunications service development: A design methodology and its intelligent support	(Eberlein and Halsall, 1997)	✓	✓	✓
26	The development of a platform to ensure an integrated care plan for older adults with complex care needs living at home	(Villa-García et al., 2022)	✓	✓	
27	Towards a new service design approach assisted by computer tools: A typology of services and a post sale service case study in the automotive industry	(Bakiri, 2003)	✓		
28	User Experience in Service Design: A Case Study from Algeria	(Touloum et al., 2017)	✓	✓	
29	Validation of service blueprint models by means of formal simulation techniques	(Estañol et al., 2017)		✓	✓
30	VDML4RS: A Tool for Reputation Systems Modeling and Design	(Bettini and Capecchi, 2016)	✓	✓	✓

totype development methodology employed in their study. Initially, a general mock-up of the application was created to facilitate user interaction and feedback collection. Subsequent iterative phases refined the prototype based on the received feedback, ultimately enhancing the platform.

The *interview technique* emerged as a prominent method for uncovering underlying problems and challenges faced by communities ((Zhiming et al., 2021), (Lee et al., 2021), (Villa-García et al., 2022)). It was

Table 3: Classification of the papers.

Classification	%	Papers
Theoretical	64%	02, 05, 10, 11, 12, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29, 30
Emp Industry	24%	03, 04, 07, 08, 15, 27, 28
Emp Academic	7%	06, 09
Emp Innovation	5%	13

Table 4: Service Design methods and techniques.

Technique/ Method	%	Papers
Prototype	37%	03, 04, 05, 07, 09, 10, 12, 17, 20, 21, 26
Interview	33%	02, 03, 04, 06, 07, 08, 12, 15, 26, 28
Survey	33%	02, 03, 04, 06, 07, 10, 15, 22, 28, 30
Scenarios	30%	02, 03, 04, 06, 11, 12, 17, 19, 28
Service Blueprint	27%	08, 10, 11, 16, 18, 20, 28, 29
User Journey	27%	04, 05, 08, 09, 13, 15, 20, 28
Personas	13%	04, 09, 15, 28
Brainstorming	10%	01, 03, 25

used to collect initial needs formulated by end-users ((Kubicki et al., 2009), (Villa-García et al., 2022)) and capture user perspectives (Patricio et al., 2004), aiding in requirement elicitation (Tuunanen and Przybilski, 2014). The studies of (Wongpinkaew et al., 2021) and (Kostova, 2018) mentioned using interviews for evaluating whether the developed solution effectively addressed the identified problem. Interviews also served as a means to analyze the usability and effectiveness of proposed systems. Finally, (Kubicki et al., 2009) mentioned its utility in soliciting feedback for system improvements.

Questionnaires and surveys served as primary tools for gathering user data, such as user feedback, akin to the interview method. (Kubicki et al., 2009) utilized a survey to delineate the initial needs of end-users, while (Patricio et al., 2004) stated its utility in providing valuable insights for requirement elicitation and interface design methods, despite not being fully tested. Finally, (Patricio et al., 2004) assert that performing surveys was helpful in identifying the key dimensions of requirements influencing customers' usage patterns.

According to (Chatley et al., 2023), *Scenarios* describe a problem to be addressed through interactions among systems. It is also stated that their relevance is ensured through development in collaboration with the community or in a user-focused manner. (Carroll et al., 2016) characterizes scenarios as rich, semi-formal design representations, while (Eberlein and Halsall, 1997) used scenarios to help achieve a comprehensive gathering of necessary requirements. (Condori-Fernandez and Lago, 2015) employed scenarios to identify business services.

Service blueprinting is characterized by a user-centered approach to business process modeling, it is a graphic tool used as a first-draft solution provider (Estañol et al., 2017). It facilitates both the visualization of tasks and activities in a service and the interactions among stakeholders within the service. Although service blueprinting is a popular technique, (Estañol et al., 2017) notes that it is rarely used to support formal reasoning and that there is no formal meaning attached to each of the tasks represented. (Zhang Li et al., 2009) reports using service blueprinting to visually display the service process, aiming to design service prerequisites and requirements that meet users' needs.

User Journey mapping served different purposes during the development process. According to (Berre, 2012), custom journey maps can illustrate user experiences throughout the service journey between the service provider and the user. (Zhiming et al., 2021) mentioned using interview data to conduct a user journey analysis. (Zhiming et al., 2021) points out that design touch points identified in the user journey provided a foundation for further exploration of SD innovations.

Personas was mentioned in three papers. (Carroll et al., 2016) asserts that personas serve as semi-formal design representations. (Touloum et al., 2017) mentioned utilizing personas to model the UX for each user involved. (Wongpinkaew et al., 2021) describe the use of co-creative workshops and interviews with the people involved in the project to create the personas, facilitating the gathering of requirements.

Brainstorming was mentioned in only two of the papers analyzed. (Kubicki et al., 2009) reported running brainstorming sessions to collect valuable information and (Eberlein and Halsall, 1997) mentioned using brainstorming in the initial stages of requirement elicitation to encourage innovation.

4.3 RQ3: Benefits of Adopting SD in Software Development

Out of the 30 papers analyzed, 12 highlighted benefits associated with the utilization of SD in software

development. Among these benefits, the most frequently mentioned was the facilitation of a more user-centered development approach, focused on user satisfaction by gaining a deeper understanding of users' needs.

(Estañol et al., 2017) states that SD can aid in the development or improvement of services by ensuring user-centeredness. This study utilized interviews with stakeholders to assess the impact of SD on enhancing user-centered practices. (Lee et al., 2021) says that SD facilitates the understanding of consumer needs through the collection of opinions and field observations. (Zhiming et al., 2021) claim that SD techniques can enable the creation of solutions more compatible with users' lives by involving consumers in the process of finding solutions. This benefit was measured through workshops and co-creation sessions involving end-users. (Patricio et al., 2004) affirms that SD tools enhance the understanding of customer needs and perceptions, ultimately improving the customer experience. Lastly, (Leinonen and Roto, 2023) notes that SD explores user and customer needs and desires. The authors based their findings on qualitative analyses of user interactions and feedback.

SD can also play a crucial role in bridging the communication gap among the various people involved in a software development project. (Estañol et al., 2017) mentions that SD can facilitate collaboration among individuals from diverse backgrounds and languages, including all stakeholders involved in a service. This was observed through case studies that involved cross-functional team workshops and communication assessments.

Another frequently mentioned benefit of SD is its ability to foster innovation. For instance, (Zhiming et al., 2021) assert that SD methods can generate innovative and optimized solutions for societal challenges. The innovation was assessed through the analysis of generated ideas and the feasibility of the proposed solutions during participatory design sessions. (Berre, 2012) affirms that SD can foster the innovation of services. Furthermore, (Eberlein and Halsall, 1997) suggest that certain SD tools encourage innovation through the informal gathering of requirements. Both studies relied on iterative prototyping and feedback loops to evaluate the introduction of innovative features.

In (Patrício et al., 2008), the benefits of the Service Experience Blueprint (SEB) method are outlined, particularly its capability to design multi-interface service experiences. The paper indicates that this method empowers customers to co-create unique service experiences.

5 DISCUSSION

Through our research, we identified several ways in which the software development community could utilize SD as a guiding framework. Our key finding is that SD can act as a bridge between users and software implementation, facilitating communication between these two entities. Also, it can contribute to delivering a more positive and personalized experience for customers, resulting in greater user satisfaction and, consequently, client satisfaction as well.

SD techniques and methods are typically employed in a co-creation environment, where users and stakeholders are involved. Many of the tools we identified were also found in the HCI RSL (Yap et al., 2021), including interviews, prototypes, service blueprint and journey map. Interviews, questionnaires/surveys and brainstorming were typically used for collecting requirements and user's needs. Service blueprint, scenarios, user journeys and personas were used to help in the visualization of the software, its tasks and activities. For validation, prototypes, interviews and questionnaires/surveys were employed, collecting feedback from the user.

We identified many benefits to integrating SD into software development. The main advantage is that SD facilitates a more user-centered approach to development as it facilitates a deeper comprehension of users' needs. Therefore, it allows for a system that is more compatible with the user's life and contributes to user satisfaction. Furthermore, we found that SD can also foster innovation. With its flexible methods that promoted creativity, and through co-creation workshops that include multiple people, this results in a more favorable environment for innovation, through diverse feedback and suggestions from the people involved.

6 CONCLUSION

SD offers a holistic, human-centered approach that emphasizes understanding user needs through research and continuous feedback, ensuring that products are both functional and user-relevant.

Our systematic mapping study provided insights into how SD can guide software development by identifying key techniques like user journey mapping, scenarios, and service blueprinting. These methods help integrate user requirements more effectively, enhancing user experience and fostering innovation. However, challenges remain in managing the complexity of software systems and effectively incorporating SD principles, highlighting the need for more adaptive strategies.

A notable finding is the scarcity of in-depth literature on SD in software development. Most references only touch on the topic, suggesting significant research potential.

Given the many benefits of integrating SD in software development, there is a promising opportunity for further exploration in this area. Future research should evaluate the impact of SD on software development, examine the associated benefits and challenges, and adopt a holistic perspective that spans from strategic business aspects to the development process for a more comprehensive understanding.

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REFERENCES

Bakiri, R. (2003). Towards a new service design approach assisted by computer tools: a typology of services and a post sale service case study in the automotive industry. In *SMC'03 Conference Proceedings. 2003 IEEE International Conference on Systems, Man and Cybernetics. Conference Theme - System Security and Assurance (Cat. No.03CH37483)*, volume 4, pages 3899–3904, Washington, DC, USA. IEEE.

Berre, A. J. (2012). An Agile Model-Based Framework for Service Innovation for the Future Internet. In Hutchison, D., Kanade, T., Kittler, J., Kleinberg, J. M., Mattern, F., Mitchell, J. C., Naor, M., Nierstrasz, O., Pandu Rangan, C., Steffen, B., Sudan, M., Terzopoulos, D., Tygar, D., Vardi, M. Y., Weikum, G., Grossniklaus, M., and Wimmer, M., editors, *Current Trends in Web Engineering*, volume 7703, pages 1–4. Springer Berlin Heidelberg, Berlin, Heidelberg. Series Title: Lecture Notes in Computer Science.

Bettini, L. and Capecchi, S. (2016). VDML4RS: a tool for reputation systems modeling and design. In *Proceedings of the 8th International Workshop on Social Software Engineering*, pages 8–14, Seattle WA USA. ACM.

Carroll, J. M., Chen, J., Yuan, C. W. T., and Hanrahan, B. V. (2016). In Search of Coproduction: Smart Services as Reciprocal Activities. *Computer*, 49(7):26–32.

Chatley, R., Field, T., Wheelhouse, M., Runcie, C., Grinyer, C., and Leon, N. D. (2023). Designing for Real People: Teaching Agility through User-Centric Service Design. In *2023 IEEE/ACM 45th International Conference on Software Engineering: Software Engineering Education and Training (ICSE-SEET)*, pages 11–22, Melbourne, Australia. IEEE.

Condori-Fernandez, N. and Lago, P. (2015). Can we know upfront how to prioritize quality requirements? In *2015 IEEE Fifth International Workshop on Empirical Requirements Engineering (EmpiRE)*, pages 33–40, Ottawa, ON. IEEE.

Cruzes, D. S. and Dybå, T. (2010). Synthesizing evidence in software engineering research. In *Proceedings of the 2010 ACM-IEEE International Symposium on Empirical Software Engineering and Measurement*, pages 1–10, Bolzano-Bozen Italy. ACM.

Eberlein, A. P.-G. and Halsall, F. (1997). Telecommunications service development: A design methodology and its intelligent support. *Engineering Applications of Artificial Intelligence*, 10(6):647–663.

Estañol, M., Marcos, E., Oriol, X., Pérez, F. J., Teniente, E., and Vara, J. M. (2017). Validation of Service Blueprint Models by Means of Formal Simulation Techniques. In Maximilien, M., Vallecillo, A., Wang, J., and Oriol, M., editors, *Service-Oriented Computing*, volume 10601, pages 80–95. Springer International Publishing, Cham. Series Title: Lecture Notes in Computer Science.

Forlizzi, J. and Zimmerman, J. (2013). Promoting service design as a core practice in interaction design. *Proceedings of the International Association of Societies of Design Research*, pages 1–12.

Gebhart, M., Baumgartner, M., and Abeck, S. (2010). Supporting Service Design Decisions. In *2010 Fifth International Conference on Software Engineering Advances*, pages 76–81, Nice, France. IEEE.

Kannengiesser, U. and Gero, J. S. (2015). Is designing independent of domain? Comparing models of engineering, software and service design. *Research in Engineering Design*, 26(3):253–275.

Kostova, B. (2018). A Proposition for a Design Method of Service Systems. In Braubach, L., Murillo, J. M., Kaviani, N., Lama, M., Burgueño, L., Moha, N., and Oriol, M., editors, *Service-Oriented Computing – ICSOC 2017 Workshops*, volume 10797, pages 339–345. Springer International Publishing, Cham. Series Title: Lecture Notes in Computer Science.

Kubicki, S., Guerriero, A., and Johannsen, L. (2009). A SERVICE-BASED INNOVATION PROCESS FOR IMPROVING COOPERATIVE PRACTICES IN AEC.

Lee, J.-J., Yap, C. E. L., and Roto, V. (2022). How HCI adopts service design: Unpacking current perceptions and scopes of service design in HCI and identifying future opportunities. In *CHI Conference on Human Factors in Computing Systems*, pages 1–14. ACM.

Lee, K.-S., Kim, Y. S., Kim, S. Y., and Park, M. S. (2021). A Study on the Improvement of User-centered Public Service. In *2021 21st ACIS International Winter Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing (SNPD-Winter)*, pages 198–202, Ho Chi Minh City, Vietnam. IEEE.

Leinonen, A. and Roto, V. (2023). Service Design Handover to user experience design – a systematic literature review. *Information and Software Technology*, 154:107087.

Lytras, M. and Sicilia, M.-Á. (2009). Software Process as

a Service? Bridging Service Design and the Software Process.

Maiden, N. (2010). Service Design: It's All in the Brand. *IEEE Software*, 27(5):18–19.

Millard, D. E., Howard, Y., Abbas, N., Davis, H. C., Gilbert, L., Wills, G. B., and Walters, R. J. (2009). Pragmatic web service design: An agile approach with the service responsibility and interaction design method. *Computer Science - Research and Development*, 24(4):173–184.

Mulvenna, M., Boger, J., and Bond, R. (2017). Ethical by Design: A Manifesto. In *Proceedings of the European Conference on Cognitive Ergonomics 2017*, pages 51–54, Umeå Sweden. ACM.

Parizi, R., Prestes, M., Marczak, S., and Conte, T. (2022). How has design thinking being used and integrated into software development activities? A systematic mapping. *Journal of Systems and Software*, 187:111217.

Patricio, L., E Cunha, J., Fisk, R., and Nunes, N. (2004). Customer experience requirements for multi-platform service interaction: bringing services marketing to the elicitation of user requirements. In *Proceedings. 12th IEEE International Requirements Engineering Conference, 2004.*, pages 23–32, Kyoto, Japan. IEEE.

Patrício, L., Fisk, R. P., and Falcão E Cunha, J. (2008). Designing Multi-Interface Service Experiences: The Service Experience Blueprint. *Journal of Service Research*, 10(4):318–334.

Pérez, J., Díaz, J., Garcia-Martin, J., and Tabuenca, B. (2020). Systematic literature reviews in software engineering—enhancement of the study selection process using cohen's kappa statistic. *Journal of Systems and Software*, 168:110657.

Petersen, K., Feldt, R., Mujtaba, S., and Mattsson, M. (2008). Systematic mapping studies in software engineering. In *12th International Conference on Evaluation and Assessment in Software Engineering (EASE) 12*, pages 1–10.

Pichlis, D., Hofemann, S., Raatikainen, M., Sorvettula, J., and Stenholm, C. (2015). Empower a Team's Product Vision with LEGO® SERIOUS PLAY®. In Abrahamsson, P., Corral, L., Oivo, M., and Russo, B., editors, *Product-Focused Software Process Improvement*, volume 9459, pages 210–216. Springer International Publishing, Cham. Series Title: Lecture Notes in Computer Science.

Pérez-Blanco, F. J., Vara, J. M., Gómez, C., De Castro, V., and Marcos, E. (2020). Model-Based Tool Support for Service Design. In Wehrheim, H. and Cabot, J., editors, *Fundamental Approaches to Software Engineering*, volume 12076, pages 266–272. Springer International Publishing, Cham. Series Title: Lecture Notes in Computer Science.

Roto, V., Lee, J.-J., Mattelmäki, T., and Zimmerman, J. (2018). Experience design meets service design: Method clash or marriage? In *Proceedings of the ACM Conference on Human Factors in Computing Systems*, Montreal, QC, Canada. ACM.

Stickdorn, M., Lawrence, A., and Hormess, M. (2019). *Isto é design de serviço na prática: como aplicar o design de serviço no mundo real: manual do praticante*. Grupo A, [Digite o Local da Editora]. E-book. Acesso em: 13 mai. 2024.

Touloum, K., Idoughi, D., and Seffah, A. (2017). User Experience in Service Design: A Case Study from Algeria. *IT Professional*, 19(1):56–58.

Trischler, J. and Westman Trischler, J. (2022). Design for experience – a public service design approach in the age of digitalization. *Public Management Review*, 24(8):1251–1270.

Tuunanen, T. and Przybilski, M. (2014). Domain Specific Case Tool for ICT-Enabled Service Design. In *2014 47th Hawaii International Conference on System Sciences*, pages 955–964, Waikoloa, HI. IEEE.

Villa-García, L., Puig, A., Puigpelat, P., Solé-Casals, M., and Fuertes, O. (2022). The development of a platform to ensure an integrated care plan for older adults with complex care needs living at home. *Journal of Integrated Care*, 30(4):310–323.

Wittern, E. and Zirpins, C. (2016). Service feature modeling: modeling and participatory ranking of service design alternatives. *Software & Systems Modeling*, 15(2):553–578.

Wongpinkaew, T., Triukose, S., Nitinawarat, S., and Piromsopa, K. (2021). Hospital Volunteer Management Process Digitalization Through Service Design: Design Decision and Implementation. In *2021 3rd Asia Pacific Information Technology Conference*, pages 47–53, Bangkok Thailand. ACM.

Yamakami, T. (2017). A dimensional model of service design toward utilizing public transportation open data. In *2017 8th IEEE International Conference on Software Engineering and Service Science (ICSESS)*, pages 922–925, Beijing. IEEE.

Yap, C. E. L., Lee, J.-J., and Roto, V. (2021). How HCI Interprets Service Design: A Systematic Literature Review. In Ardito, C., Lanzilotti, R., Malizia, A., Petrie, H., Piccinno, A., Desolda, G., and Inkpen, K., editors, *Human-Computer Interaction – INTERACT 2021*, volume 12933, pages 259–280. Springer International Publishing, Cham. Series Title: Lecture Notes in Computer Science.

Yoo, D., Ernest, A., Serholt, S., Eriksson, E., and Dalsgaard, P. Service design in HCI research: The extended value co-creation model. In *Proceedings of the Halfway to the Future Symposium 2019*, pages 1–8. ACM.

Zhang Li, Chen Zhong, Ni Yulin, and Si Huayou (2009). Designing new software-included service system: methodology and operational tools. In *2009 6th International Conference on Service Systems and Service Management*, pages 727–730, Xiamen, China. IEEE.

Zhiming, N., Lele, Z., Yu, Z., Yumeng, T., and Choi, S. (2021). Design and Research of Mobile Assisted Medical System Intervention in the Elderly Community: A Case Study. In *2021 2nd Asia Service Sciences and Software Engineering Conference*, pages 74–83, Macau Macao. ACM.