Design

# Let it Flow - Making Generative Service Design Work

John R Knight

Aalto University

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**Abstract**

This dissertation reports on doctoral research on agile service design work. The focus of the inquiry was to explore in-house design, understand current working practices and identify potential improvements if and where necessary. The research was published as five articles, each of which drew on a series of mixed methods, empirical studies that explored different aspects of agile design work. The first article found that adopting agile had both negative and positive effects on a team of practitioners who were shifting from waterfall to scrum working in a design agency. The second publication reported on a healthcare case study that trialled ways to unify agile and service design and the third article tackled the business context of service innovation and introduced a new conversational service methodology. The fourth publication shifted attention back to practitioners' experiences of agility and reported issues affecting designers' occupational balance in extreme agile. Problems emanated from poorly defined tasks, ambiguous requirements, weak project vision and cross-functional misalignments. These factors, both individually and in combination, often stymied progress, reduced design impact and integrity and eroded practitioner wellbeing. The concluding article identified specific ways and means to improve integrating design in service production in different forms of agile. The results suggested that looser modes of agile could be ameliorated through principled, positive, practitioner resistance alone. More rigid agile forms, however, were improved by applying four foundation design practices, whereas intense and scaled forms required more structured approaches to team task definition and workflow control. In the final inquiry, practitioner feedback indicated the proposed remediating and resistant approach to unifying design and agile helped make service design work flow and improved practitioner job satisfaction.

**Keywords** Service Design, Agile, Design Economy

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# Let it Flow - Making Generative Service Design Work

# Foreword

Here's a little bit of advice
You're quite welcome, it is free
Don't do nothing that is cut price
You know what that'll make you be
They will try their tricky device
Trap you with the ordinary
Get your teeth into a small slice
The cake of liberty

Ian Dury

# Acknowledgements

This PhD is the product of many hours of study over many years. Extracting minutes and hours out of everyday life to do my research could only be achieved through my family's unwavering, generous and selfless support. I must therefore firstly acknowledge that my wife Kyla, son William and daughter Theadora have not only enabled me to finish my studies so far but are there patiently and diligently helping me conclude my research in writing this dissertation.

Studying for years requires dedication. However, the passage of time can weary the most zealous student. It is only through the continual support of my learned supervisors and professors at Aalto University that I have not only reached the end but have also published work of some value through a series of articles leading up to this dissertation and contributed to design research perhaps.

Aalto has nurtured, sustained and inspired me to go on, to go further and to aspire to the qualities of high-quality research that the university is rightly renowned for. Regular contact with my supervisors, attending winter and summer schools and informal discussions with the wider research community have been essential in getting me to this endpoint. Thank you Turkka, for taking me on as a student, Andreas and Sari for guiding me as supervisors, and Sampsa for challenging me, supporting and giving a perfect balance of steer and autonomy to get this work over the line. Also thanks to Guy for opening a path to connect the later stages of my studies to design theory through to the new school of design writers (Manuel Lima and Silvio Lorusso) taking a practitioner standpoint. Practical support through the university has also been critical to my academic success and includes technical help and access to knowledge, technology and guidance. Thanks to Tiina too for ironing out the snags.

Lastly, I would like to acknowledge the important contribution my design peers have made to my work. Studying as a practitioner has challenged my time management, but at the same time has provided me with an incredibly rich domain in which to situate my research. My designer friends have encouraged me and given me strength; Francesca Tassistro and Dominira Saul – thank you both for your amazing support through the years.

My co-authors have practically helped me in all kinds of ways. Damian Copeland helped me link service design and conversational interface innovation. Deniz Sayar similarly helped me connect service design to business needs and Dr Rachel Jones enabled me to contextualise my findings through her strategic consultation work. Dan Fitton contributed to several of my studies and was invaluable in providing a scientific mindset to my sometimes chaotic thinking. Lastly, colleagues provided opportunities to work on many projects, where I was both a practitioner and an academic researcher. Chris Gibbons at

Accenture provided important background to the case, while Elliot Ross, helped to run several experimental studies.

Tarporley, Cheshire Plains, 10th April 2024

# Contents

# List of Publications

This doctoral dissertation consists of a summary of the following publications which are referred to in the text by their numerals.

**1.** Knight, J. (2017). Go with the Flow: Accelerated Digital Design in the Age of Post-Agility. In: Di Lucchio, L,. Imbesi,. L & Atkinson, P. (eds) Design for Next: Proceedings of the 12th European Academy of Design. Sapienza University, Rome, 12th to 14th April, 2017. Taylor and Francis. The Design Journal, Volume 20, Supplement 1. Pages 52700 to 52715. ISBN 978-1-138-09023-1 https://doi.org/10.1080/14606925.2017.1352781

**2.** Knight, J., Gibbons, C., Ross, E & McEwan, T. (2019). Unlocking Service Flow. Fast and Frugal Digital Healthcare Design. In: McDonagh, D., Woodcock, A., Moody, L & Jain. (eds) Design of Assistive Technologies for Aging Populations. Pages 171 to 187. ISBN 978-3-030-26292-1

**3.** Knight, J., Jones, R., Sayer, D., Copeland, D & Fitton, D. (2020). Do It Fluid: Innovation in Smart Conversational Services Through the Flow Design Approach. In: Rodrigues, J., Cardoso, P., Monteiro & Ramos, C. (eds) Smart Systems Design, Applications, and Challenges. Pages 238 to 258. DOI: 10.4018/978-1-7998-2112-0.ch012

**4.** Knight, J. (2022). The Hexadecimal Factory - Product and Service Design Work in the Digital Economy. In: Antipova, T. (eds) Digital Science. DSIC 2021. Lecture Notes in Networks and Systems, vol 381. Springer, Cham. https://doi.org/10.1007/978-3-030-93677-8_1

Knight, J. (2023). Resistant and Remediating Design. The Design Journal, 26:4, 604-623, DOI: 10.1080/14606925.2023.2215422

# Author's Contribution

**Publication 1:** Resistant and remediating design

The author conducted all research and writing activities for this article.

**Publication 2:** The Hexadecimal Factory - Product and Service Design Work in the Digital Economy

The author conducted all research and writing activities for this article.

**Publication 3:** Do It Fluid: Innovation in Smart Conversational Services Through the Flow Design Approach

The author was the main contributor to this article, proposing and consolidating section inputs as well as contributing two sections personally. The joint author approach was needed to cover the technical, HCI and innovation elements of the work.

**Publication 4:** Unlocking Service Flow. Fast and Frugal Digital Healthcare Design

The author wrote this article with input from Ross, C. The joint author approach was needed for publishing the case and editing.

**Publication 5:** Go with the Flow: Accelerated Digital Design in the Age of Post-Agility

The author conducted all research and writing activities for this article.

# Abstract

This dissertation reports on doctoral research on agile service design work. The focus of the inquiry was to explore in-house design, understand current working practices and identify potential improvements if and where necessary. The research was published as five articles, each of which drew on a series of mixed methods, empirical studies that explored different aspects of agile design work. The first article found that adopting agile had both negative and positive effects on a team of practitioners who were shifting from waterfall to scrum working in a design agency. The second publication reported on a healthcare case study that trialled ways to unify agile and service design and the third article tackled the business context of service innovation and introduced a new conversational service methodology. The fourth publication shifted attention back to practitioners' experiences of agility and reported issues affecting designers' occupational balance in extreme agile. Problems emanated from poorly defined tasks, ambiguous requirements, weak project vision and cross-functional misalignments. These factors, both individually and in combination, often stymied progress, reduced design impact and integrity and eroded practitioner wellbeing. The concluding article identified specific ways and means to improve integrating design in service production in different forms of agile. The results suggested that looser modes of agile could be ameliorated through principled, positive, practitioner resistance alone. More rigid agile forms, however, were improved by applying four foundation design practices, whereas intense and scaled forms required more structured approaches to team task definition and workflow control. In the final inquiry, practitioner feedback indicated the proposed remediating and resistant approach to unifying design and agile helped make service design work flow and improved practitioner job satisfaction.

# 1 . Introduction

## 1.1 Digital service design practices and its research gaps

Preliminary analysis of the literature and casework done early in the research within several organisations (See Methodology Section, Research Matrix) suggested a gap between existing design research knowledge and digital design practice (See Appendix for information on the positioning of this research).

The scarcity of research in this area, noted by Yee (2010) is surprising given the wealth of literature on other related disciplines (e.g. architecture) and proximal topics such as design method adoption, innovation processes and agile and user-centred design integration.

With just a couple of studies, published some years ago, and mostly in consulting rather than in-house design practices, this research began with basic groundwork in establishing foundational terms of reference, necessary to progress inquiries into more targeted problem statements and research questions.

Fallman (2006, pp 6) helped define the particular kind of practice studied in this research at this early stage:

> Design practice denotes the kinds of activities that interaction design researchers are involved in … working for a commercial interaction design organization, a consultancy company working with client commissions, or an in-house design department.

The few publications tackling these kinds of practices include Jenkins (2008) and McKinlay and Smith (2010). The latter collection of articles contains a valuable description of waterfall (Royce, 1970) digital design in the nascent German multimedia sector of the noughties (Mayer-Ahuja and Wolf, 2010), showing differences between consulting and in-house work across two organisations in line with this research.

Goodman (2013) built on the early European studies some years later, offering a detailed in-depth analysis of three pre-agile, Californian interaction design consultancies, providing a valuable historical point of reference for this research and a baseline description of design work.

Nowadays, the kind of work Goodman described is done by in-house teams in every possible kind of private and public organisation (Julier, 2017, pp 156), as well as in the sort of design agencies and technology consulting firms she derived her findings from. However, beneath the surface and despite seeming similarities in terminology, working methods and deliverables, much has changed in design work in the last decades.

The ongoing shift from waterfall to agile development and the emergence of service design are two crucial changes, that have transformed traditional digital design work in the

intervening years. Fayard, Stigliani & Bechky (2017) report that newer practices, including blueprinting (Ibid. pp 60) and co-design facilitation (Ibid. pp 56) have extended the range and complexity of design work, shifting attention from attending to single website interfaces to integrating into broader organisational strategy and service innovation activities. The role of the designer has similarly evolved, notably in increased collaboration with an ever-diversifying network of stakeholders.

These changes are noted by Hinderks, et al (2022), who provide the most recent account of practice. They report that nowadays design work is roughly evenly split between up-front activities (in line with the kind of interface design work reported by Goodman, 2013) and newer agile aligned tasks, such as UI code production[1] that were absent in past accounts.

Hinderks description of an extended role of design and utilisation ratios concurs with this research (see Terms of Reference), where 28% of tasks were related to production, 14% to upfront work activities, design crafting[2] made up 22% and other tasks, including intermediary work stood at 30%. A mere 6% of the total work ratio related to service design.

While past accounts of practice differ in many ways from present digital design practice, studies generally pay little attention to practitioners' occupational experiences in general, and specifically their work within large, in-house contexts. Similarly, descriptions of designers' workflows, tools, methods and deliverables are well evidenced, but the voice of the designer and insights into their everyday lives, joys and tribulations are largely absent in the literature.

Björklund & van der Marel (2019) are a notable exception to this tendency, in drawing attention to designers' yen for meaningful moments through their work in global, enterprise-level organisations. Research on the felt experience of design work is thus not only a gap-filling exercise but is also crucial in evidencing the seismic shift from consulting to in-house design industrialisation that has occurred in the last decade.

The publication of Julier's *Economies of Design* (2017) marks a turning point in the growth of design (e.g. in the numbers of workers and the value of their labour) and its wider economic context (Ibid. 2017, pp 25). This critically important publication connects macro-level changes present in contemporary society, including deregulation and post-Fordism (ibid, pp 5) to design. Extending this analysis away from the generalities of neoliberalist economics (*context* is used to delineate this kind of theoretical framing in this research) and into the concrete particularities of contemporary commercial design practice is a gap in knowledge on design work closed through this research.

The expansion of the digital economy (Bukht and Heeks, 2013, pp 19), coincided with a shift from the traditional value exchange of physical goods to a more technologically contingent, service-oriented kind of commerce built on value co-production (Vargo & Lusch, 2014).

This shift has in turn powered an era of 'creative intensity' (Julier, 2017, pp 43 or *industrialised digital design,* see Chapter 7, Terms of Reference) that is characterised by an ever-increasing demand for creative services. Newly digital native organisations, (e.g. e-

[1] Designers are commonly involved in frontend workflows including styling specification tasks.

[2] Design crafting involves planning the work, doing the work and pivoting plans when change is needed – See Terms of Reference.

commerce providers and social media platforms etc) as well as traditional bricks and mortar businesses, such as high street banks have undertaken *digital transformation* (Julier, 2017, pp 26) programmes to reduce operating costs and increase revenue primarily through adopting agile and design, powering the diversification of design practices further.

Numbers bring these changes to life and indicate the financial significance of the digital design sector. In the UK alone, design contributed £97.4 Bn (Design Council, 2022 pp 41) to the economy. More traditional design disciplines, (e.g. industrial design) with greater presence in the research literature, even when combined, employed roughly a quarter (225,013) of the number of digital designers (866,056), across a stable ratio of roughly two-thirds in-house to one-third consulting design practices over time (Design Council, 2007, pp 29). This diversified design population means:

> People [are] working in the creative production of goods and services but not necessarily as part of creative industries organisations (e.g., in-house designers….especially in software. (Julier, pp 43).

These new kinds of designers, are servicing an ever-expanding range and number of host organisations' creative needs, performing a proliferating range of roles, pushing beyond traditional brand artworking, ad creative and even digital information architecture roles into an 'accumulation of design specialisms' (Julier, 2017, pp, 5).

These new specialist disciplines include 'service, interaction, experience, mobile application' design (Ibid. pp 5) as well as content, motion, business, enterprise, and an ever-diversifying array of new creative jobs needed to meet the '*commercial reality*' (Cochrane, 2010, cited in Ibid. pp, 25) of the digital economy.

Newer design jobs extend and deepen the role of design far beyond the kind of artisanal creative work described by Goodman (2013), notably in aiding strategic service innovation delivery through:

> a perspective, method and, toolset that enables an organisation to realize business ambitions as well as a way to deal with internal and external challenges. It offers an approach to deal with strategic initiatives as well as operational challenges… (Reason, Løvlie and Brand Flu, 2015).

Despite the overt business orientation of service design, there are challenges to value realisation in practically applying the methodology in the wild. Specifically, realising future service visions within organisational constraints and limited production capabilities can be tricky. Indeed, the difficulty in delivering highly usable, desirable and innovative services has proven hard even for the big five consultancies, who benefit from leading agile development and business consulting capabilities, combined with newly acquired design chops.[3] The service reality gap is not lost in academic design literature either where:

> There is the need for research on how service design processes and outcomes can be better

[3] Accenture's acquisition of Fjord is an example of the industrialisation of design and consultancies driving business, design and technology convergence in their offerings.

linked with and integrated within the development stages of services to enhance more effective implementation.' (Sangiorgi & Yu, 2014, pp 11)

The service *implementation gap* is closely linked to the prevalence of staged waterfall ways of working within service design (Ollila, pp 53, 2022). Service design tends to promote implicitly linear or waterfall approaches to development and production processes where design proceeds through stages of discovery and definition (albeit with the exception of Pezzotta et al (2018). Similarly, a disposition toward greenfield service opportunities, where entirely offerings conceived from extensive up-front research prevail in the cases and literature. These kinds of unrestricted projects (anything is possible) contrasts with the more common ask of designers (particularly in-house) to incrementally evolve existing services, which is arguably a much tougher task as there are more constraints and complexity in this situation. This divergence manifests in concrete, practical challenges for teams, as agile is the predominant service production methodology used by in-house providers (see below).

Conducting extensive discovery research and producing high-level, high-resolution 'to-be' blueprints is hard to marry to agile because of the in-built, emergent nature of scrum. In contrast to fixed inputs and outcomes, agile is attuned to constant change and optimisation in use.

Generally and in contrast to the service design literature, HCD/HCI initiatives to integrate agile and UX (e.g. Cockton et al, 2016) *mix* continuous delivery, design and research activities rather than sequence them, thus offering a more harmonious combination of practices. However, broad service design adoption, industrialised digital design practices and the diversification of forms of agile, arguably require more fundamental and holistic ways of integration as this research shows.

To further analysis from this early positioning work summarised in this introduction, this research then moved to explore the agile literature in detail (c.f Knight, 2017), to help make sense of the context of contemporary digital design practice, as the methodology is deeply embedded in host organisations and therefore plays a part in shaping what designers do and how they work today.

## 1.2 Digital Service production

Nowadays, most digital services are delivered through agile (Beck et al, 2001) development[4]. Early academic research on agile focused on understanding the potential of the methodology, including identifying prospective efficiency gains. The value of shifting from (waterfall) documenting throwaway software specifications to delivering working software that *embodied requirements*[5] in two-week sprints was attractive to developers as well as accountants.

[4] According to PMI (2017) agile methodology adoption covers 71% of global digital enterprises (c.f Vallon *et al,* 2018).

[5] Embodied specification refers to the current service increment being the reference specification, without documentation.

Then a host of studies were published, showing actual cost savings, code error reduction comparisons and improved quality of software metrics, triggering a wave of adoption (Salo & Abrahamsson, 2008) across digital enterprises from the millennium onward.

In time, research then shifted to agile adoption (c.f Sidky, Arthur & Bohner, 2007), where organisations such as Lego (Sommer, 2019) found taking the deceptively simple step to scrum could trip up the savviest of organisations. In reality, as the contemporary literature attests, agile adoption was deceivingly complex and involved wide-ranging operational change, not just in production, but within broader supporting areas such as human resources, who needed to enable workforces with the right tools and mindsets to succeed (Mikalsen, et al, 2018).

Tan et al (2020) diagnose common implementation disorders via five remedies, resting on personal characteristics, team capability, organisational culture, growth and learning support, and customer involvement. In other words, agile success depends on combining capabilities, proximal to software development, but crucial to sustainable organisational growth including design thinking (innovation), change management (people) and strategy (c.f Hoe, 2022).

While adoption remains challenging even today, an extensive range of methods, ceremonies (e.g. Stand-ups) and tools (e.g. Kanban boards) have helped embed agile practices into the fabric of production work itself (Evbota, Knauss & Sandberg, 2016). Similarly, a growing number of agile accelerators, tools and add-ons (e.g., burn-down charts etc) have been introduced, which while not core manifesto practices, address issues that have emerged in real-world implementations (Hartmann & Dymond, 2006).

In some cases, these improvements regress to waterfall-style, stage-gating practices (e.g. definition of ready and code reviews) and introduce potential bottlenecks and bureaucratic type blockers (e.g. project management practices, c.f Rios, et al 2018) rather than powering greater velocity.

Work ticketing is an example of where agile-aligned minimal documentation can in reality snowball into convoluted specification histories, often generating the need for time-consuming reviews and signoffs that compromise the agile advantage (c.f Kajko-Mattsson, 2000).

Growing agile maturity has prompted more reflective views on remediating the methodology (c.f. Cockton et al, 2016). These include UX-aligned improvements such as proposals by Hoda, Salleh & Grundy (2018) who position design as a unifying force in ironing out chaotic scrum work kinks (Kautz & Zumpe, 2008). This body of research (c.f. Knight, 2017) is generally more balanced in taking account of the pros as well as the cons of agility, compared to the overwhelmingly positive software engineering literature and the relative absence of the topic in service design.

The next stage of this research sought to build on this balanced understanding of agility, articulated in the first article that also proposed a more fluid and unified approach to continuous delivery through the guiding principle of Flow (See Terms of Reference). Secondly, developing a deeper understanding of how agile principles play out in the realities of design practice across a broader set of organisations was seen as an important step in contextualising the findings from Go with the Flow, the literature and the wider field of industry practice.

## 1.3 Agile software production

A key agile tenet is accommodating change. This overarching drive to accommodate modifications continuously in development can impede smooth workflows, especially for design work which is often the primary means of manifesting requirements before coding. This means that design deliverables (e.g. wires and flows) are needed up-front and play a crucial role in project management on the proviso that it's easier to change design deliverables than code. Agility can additionally conflict with the ways designers think and practice (according to the orthodoxy, c.f Cross, 2011) which is generally seen to progress from up-front research through to a finalised (i.e. unchangeable) solution.

In the days of waterfall development, designers worked with requirements that were predefined, fixed and documented in detailed specifications. If a change was requested during development, like a new and unplanned feature, it was scoped into the next big release specification (c.f Kramer, 2018). While inefficient it was arguably easier to design for fixed requirements than to constantly rework outputs to reflect constant changes in scope and specification.

In agile, this process is accelerated via a managed backlog that stores all requirements as short task descriptions. These are then estimated, planned and prioritised into two-week blocks of development work (Sedano, Ralph & Péraire, 2019) so that individual sprints deliver releasable increments that combine work from many teams through continuous integration and release management (Heikkilä, et al, 2013). The process is repeated until all backlog tasks are completed albeit with new tickets constantly being added and amended.

New requirements and changes to existing ones can come from a variety of sources. For example, modifications can come top-down from organisational shifts in strategy, as well as internally within sprint teams as evolving understanding of the problem alters the agreed scope (Williams & Cockburn, 2003). Regulatory changes are one of many external drivers of change that particularly affect in-house agile teams' backlog priorities.

Changes in direction can come from the design work itself. Designers' shifting focus between problem and solution can spawn insights and new or different requirements (Binder, et al, 2011 and Johnson, et al. 2014). Inconsistent user representations (e.g. personas, Mäkinen, Hyysalo & Johnson, 2019) and variations in understanding them can also trigger about turns in development, even in waterfall as Goodman notes: 'messy course changes and renegotiations' (Goodman, 2013, pp 142) were common practice.

In small teams, change management is relatively simple as lines of communication are short, but complexities grow as agile is scaled to accommodate more strategic development efforts (Zaina, Sharp & Barroca, 2021). Managing change at scale, where tens of sprint teams are working synchronously, often necessitates bolstering organisational-level support including standing up 'development operations' (AKA Dev Ops, Ebert et al, 2016) teams, although even this kind of fix comes with its own challenges (c.f Kuusinen, et al, 2018, pp 63).

*Synchronisation issues*[6] (Laanti, 2008), where individual teams are at different stages of sprint task completion at any one time, are common in agile (Mikalsen, et al, pp 61).

[6] Refers to when interaction between different teams and production elements is out of sequence.

Dependency issues are also customary. These impediments disentangle and block teams that are reliant on the outputs of colleagues and differences in task complexity and varying levels of goal clarity, team availability and dependencies on external inputs, (e.g. regression testing) can exacerbate matters further (Melo, et al, 2011).

Similarly, technical debt (see Klinger, et al, 2011) can reduce wholesale team velocity as work needed to keep legacy systems operational (*keep the lights on*) most often trumps more valuable innovation efforts (Guo, et al, 2011).

Parker et al, (2015) concluded that the benefits of agile integration of autonomous working practices have been *oversold*. Similarly, Acharya & Colomo-Palacios (2019) note that this type of work is hard to sustain when teams are constantly changing with leavers and joiners. Tricky interpersonal issues of trust, differing levels of team knowledge and agile maturity (c.f Bjørnson *et al,* 2018) also come into play.

Difficulties in establishing and retaining stable sprint teams (Mikalsen, et al, 2019), even in perfect conditions, point to the human impact of agile work. Meier et al (pp 259 to 267, 2018) found that counter to early adopter claims of agile reducing stress (e.g., Rajeswari, 2003, cited by Meir et al, ibid), the reality was more complex if not contrary. Workers' occupational experience and balance were often impaired, needing extra effort in non-functional work to resist the negative effects where:

> agile teams replace hierarchy with concertive control, which is a form of peer pressure through which teams ensure that each member complies with social norms' (Junker et al, 2022, pp 5).

Fortmann (2018) expands on the potentially harmful effect of internalising social relations issues at work in this way, where the need to 'self-regulate' and 'control behaviour' triggers stress and engenders team friction in the absence of moderating authority. At the same time, autonomous working presents opportunities for increasing practitioners' professional agency, evident in this research and the literature, including Parker, Holesgrove & Pathak (2015) who found that sprint teams' capability, velocity and productivity increase over time.

The next phase of this research took these generic issues and refined them in light of creative practice. This involved gaining a deeper understanding of how agile influences design, its impact on practitioners and points of convergence and divergence between the two kinds of practices (agile and design), based on empirical fieldwork and continuing casework that aimed to answer three key questions.

## 1.4 Research questions

RQ1: **How does design work within agile service production?** This question aimed to build on the initial lines of inquiry, develop a better understanding of this kind of practice, with reference to the literature and identify potential ideas for making improvements to production design. The results related to this RQ were published in the Go with the Flow and Fast and Frugal articles.

RQ2: **How do digital designers deal with agility?** This question aimed to probe the positive and negative aspects of production work at a deeper level, as well as practitioners' strategies to maintain design integrity and related to the Hexadecimal Factory article.

RQ3: **How can service design work be improved**? This question aimed to gain insights into service innovation and develop a unifying approach of applying practitioner resistance and foundation practices to improve occupational balance and make service design work better. The results were published in the Resistant and Remediating Design and Do it Fluid articles.

## 1.5 In-house agile service design work

Analysis of the literature helped shape the empirical work in this research and at this stage of inquiry prompted a shift from generic issues in agile to specific design challenges and opportunities. Generally, common issues noted in the literature focused more on the effects (e.g. marginalisation, (Cajander, Larusdottir, & Geiser, 2022, pp 2 and disempowerment, Schell & O'Brien, 2015 pp 225 & xi) rather than their causes within agile work practice, such as designers being assigned to multiple scrum teams (Jurca, et al, 2014, pp 28).

Empirical findings highlighted consistencies with the kinds of negative effects of scrum found in the literature, as well as new ones born from insights in fieldwork such as rework, conflict and task definition.

These new understandings underpinned the articles and included insights into designers' role in agile, the work they performed in shaping or *crafting* (See Chapter 7, Terms of Reference, adopted from Mäkikangas & Schaufeli, 2021) design work in service production[7] and the foundation practices that helped them succeed in differing forms of agile.

Endemic *rework*,[8] was an issue found in the casework. *Middling missions* were found to be particularly susceptible to this issue, as they lacked the strong strategic alignment and organisational clout gifted to *strategic missions,* nor benefited from the speed and simplicity of doing *tweak work*.[9]

Dealing with conflicting requirements and stakeholder demands increased designers' identity work (Pääkkönen & Bos-De Vos, 2022). As with persuasive *selling*[10] type activities, where practitioners needed to influence stakeholders to gain sign-off,[11] this often involved using a variety of strategies. These included rationalising design with data, providing evidence of solving a known user or business problem through to more direct ways of asserting authority as professional designers.

There is evidence in the literature (van Onselen, Valkenburg & Snelders, 2020) that these more resistive means to achieve success in promoting design integrity come with experience in alignment with the final article's conclusions.

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[7] See Table 1, Study j verbatim 'Providing approach' – all quotes that follow are relevant examples of research verbatim data.
[8] An indicative figure is 46% rework vs. 54% origination in a team survey from case d (Table 1).
[9] Study e, Table 1.
[10] Study j, Table 1. 'Hustling for a new meaty project'.
[11] Study j, 'User journey sign off with clients'.

Work planning (AKA design crafting) was found to be often done by non-designers, causing friction as practitioners sought to maintain design integrity, avoid conflict and plan *meaningful work* using their *judgement* (Dindler, et al, 2022 and Löwgren & Stolterman, 2004) and by dint of effort through the work itself.

Embedded as dedicated resources in sprint teams, practitioners often lacked variety in the work assigned to them and there were differences in how well scrum masters understood, defined, supported and managed designers' tasks. This required practitioners to positively resist the piecemeal tendencies of sprint work[12] by proposing alternative remediating work, that balanced short *and* long-term gain[13].

In the diary study research, these negative issues were not universal. Instead, practitioners' experiences spanned a spectrum of good to bad occupational experiences (Hammell, 2009) that resulted in variations in practitioners' occupational balance (Wilcock, 1991) in different kinds of projects and forms of agile. Similarly, there were variations in practitioners' resilience and resistant and remediating strategies.

Positive experiences of agile related to the collaborative, goal-directed nature of design work that helped increase knowledge and skills and connected personal values with doing (c.f. professional agency, Eteläpelto, et al, 2013 is an equivalent concept used in this research).

As noted by Charalampous, (2020) the buzz of fast-paced delivery can be exhilarating, through the joy of 'just doing the work'[14] and the strong camaraderie (Ruyle, De Meuse & Hughley, 2021) felt in high-performing teams[15] where colleagues could immediately see the fruits of their work,[16] were other gains reported in this research. Typical agile ceremonies enhanced the positives, where team retrospectives and close collaboration built trust and knowledge too.

The *indeterminacy*[17] of agile working influenced how design was done within different organisations and thus indicated how it might be improved – no one size fits all (Morgeson, Dierdorff, & Hmurovic, 2010). Factors that dissimilate scrum include differences in agile forms. These range from simple to scaled implementations (Paasivaara, 2017) and taking account of varying team sizes and competencies, types of work, organisational and sectoral differences and variances in mission goals, resources and durations at the level of sprints, strengthen the case for a heterogenous approach to making agile service design work better as recommended in this research.

Löwgren & Stolterman, (2004, pp 9) make a similar point, using the term *absolute particular* to describe the uniqueness of individual cases of design work in the wild. Together these findings and the literature suggest the need for a variety of measures to improve designers' experiences of agile – and to elevate design impact. In summary, design work in agile ranged from good to bad, albeit with some common occupational and organisational tensions on the negative side.

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[12] Study j, 'Stakeholders trying to push more than is realistic into sprints'.
[13] Study j, 'the incessant planning and tracking combined with the short-sightedness of solving a problem now, not the RIGHT problem tmrw'.
[14] Practitioner verbatim from diary study.
[15] Study j. 'strong relationship with developers make it easy to bring products to life, and validate'.
[16] Study j. 'Being able to get stuff done quickly and the iterative way of working'.
[17] It can be good, bad or somewhere between with many variables influencing the specific forms of agile within organisations.

The guiding principle of flow, which accommodates differences in the absolute particular runs through the five articles and underpins opportunities to improve the lot of internal designers, as:

1. Agile production varies widely,
2. Design teams are often poorly integrated into production work,
3. This in turn can lead to conflict, misalignment and compromise and is,
4. Exacerbated by practitioners often lacking control of the work they do,
5. Which in turn reduces design impact, integrity and practitioner well-being, as:
6. Designers vary in their ability to deal with these kinds of issues alone.

Together these factors suggest the need for a unified approach comprising of:

- A heterogeneous approach to help design flow (to address 1) that enables:
    - Habituating positive practitioner resistance (to address 5 & 6),
    - Applying situated remediating practices (to address 2 & 3), and
    - Regulating design operations to manage the work better (to address 4).

Habituating positive practitioner resistance refers to practitioners' positive resistance in the workplace to challenge the status quo, defend design integrity and manifest values within the work they do. These acts of pushing back or promoting alternatives, often reflect practitioners' values (e.g. accessibility advocacy), those of the practice they belong to (e.g. teamwide design principles) and the wider workplace. This suggests that practitioner resistance is contingent on the contextual values manifested through work from practitioners, colleagues, the host organisation and beyond.

Unlike remediation, which involves applying combinations of complementary practices, practitioner resistance is highly subjective – every individual practitioner has and develops their own agenda, work practices and survival strategies at work - no one size fits all and these may become part of designers' repertoires (Löwgren & Stolterman, 2004, pp 166).

Applying situated remediating practices means *formatting*[18] design work according to situational constraints and opportunities to ingest four key design improvers:

- Strategic positioning (service design)
- Production integration (design operations/centralised operating models)
- Design-led collaboration (design thinking)
- Data and insight production (Human-centred design

Extreme agile forms necessitate greater structuring in enabling design flow than resistant and remediating design can achieve alone. Centralising design work refers to formalising design work organisation so that designers can work across sprints and leadership can qualify work to ensure strategic fit and regulate teamwork. The lack of literature on this kind

[18] Term used in the occupational literature to describe intentionally structured activities.

of design operations approach necessitated developing and testing out various regulating approaches in the casework culminating in the Centralised Design Operating Model (unpublished):

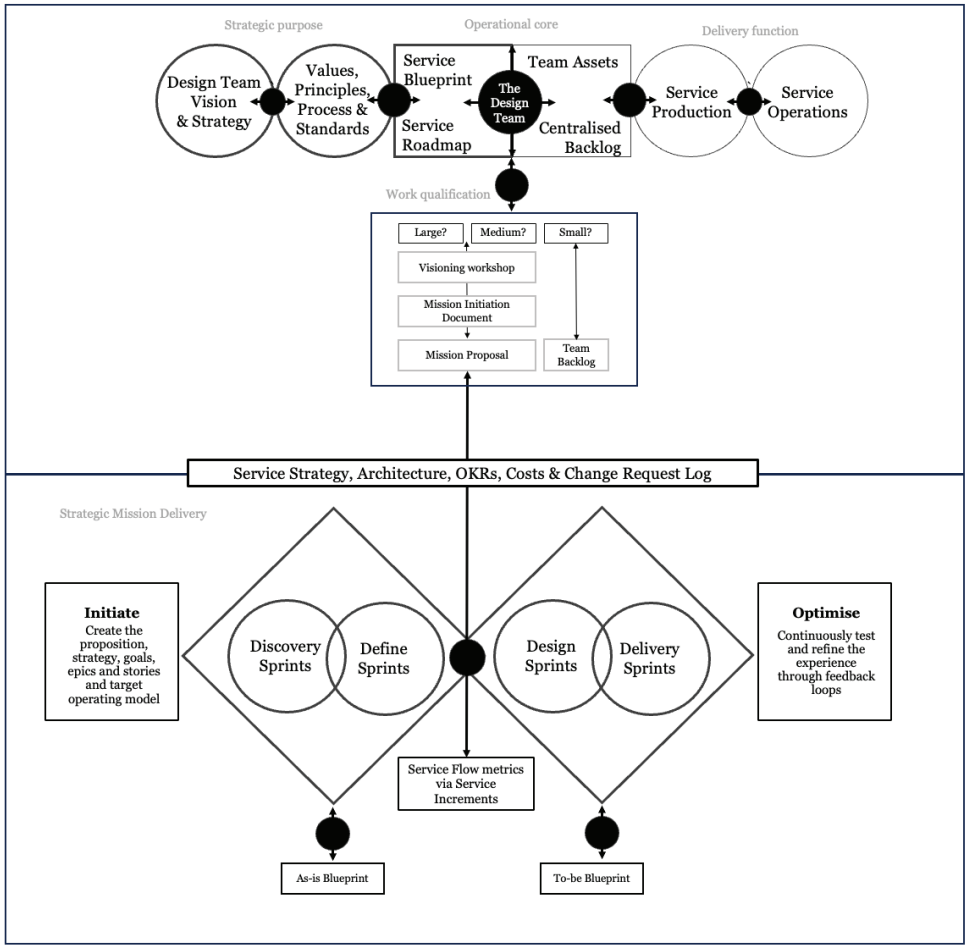



**Figure 1** Centralised Design Operating Model

The model comprises three interrelated organisational elements that are defined in the team's operating model document and are manifested in the respective individual element documentations and repositories. The *strategic purpose* documents vision, strategy and values through to teams' key processes and metrics. The design teams' overarching *operational core*, includes the living blueprint for their organisation's service as well as supporting elements including design systems. The *work qualification* process is the controlling element of operations and describes how work requests come into the team and are then winnowed out in terms of size and complexity. Large projects go through a formal definition process, whereas small tasks go directly into a centralised team backlog. The strategic mission delivery process outlines the typical agile aligned service design approach

for these larger-sized projects. Lastly, the *delivery function* enables, controls and measures team output so that designers can support many development sprint teams.

# 2 . Connecting background theories

### 2.1 Review of relevant theories in the literature

Differing theoretical positions have been taken to understand professional design of the kind studied in this research. Foremost are those built around theorizing about professional practice and include macro-level studies on the economic context of design (Julier, 2017) through to gaining an understanding of the granularities of practice via the lens of social science theories. Goodman (2013) extols the virtues of a practice theory aligned standpoint by providing:

> a definition of practices, plural, as durable clusters of human behaviors, meanings, tools, and so on; second, a concern for practice, singular, as the ongoing enactment of order by those clusters of activity (Ibid. pp 22) and practices…are in the broadest sense 'arrays of activity': clusters of physical actions connected by shared purposes, assumptions, or goals

Self-determination theory (Ryan and Deci 2000, cited by Björklund and van der Marel (2018) is a different approach that shifts the focus of inquiry from the social to psychology. Alignment to this theory helps explain how innate needs, sense of worth and work interact (Ibid. pp 755) within design practice. A third and similar approach stays with the focus on the mind of the practitioner and applies related theories of cognition to creativity (c.f Stempfle and Badke-Schaub (2002).

Then there are more philosophical inquiries into practice, often combined with close participant observation, such as Schön (1983) who builds theories of action from eliciting self-reports, making observations of practitioners and drawing inferences from talking to them.

Lastly, understanding design from a practitioner perspective, without making strong connections to either theory or experimentation, but conveying insights that have an intuitive rightness to them, such as Löwgren & Stolterman (2004) is yet another way of making sense of the richness of practice in the wild.

These varying approaches produce insights that shed light on discrete aspects of practice, such as the role of tacit knowledge, or the effect of individual differences and even universal concepts such as the codified forms practice takes. In concert, the differing theories and research methods used to explain design practice provide a holistic understanding of the topic, except for designers' work context which is largely absent in the literature. Arguably there is no overarching theoretical approach that provides a holistic conceptual framework that accounts for both the granular elements of doing and its full, wider context. Generally, this research is more situated between those two extremes in focusing on design work.

Organisational studies extend the focus on practitioners into the context of work. Such research spans design management focused inquiries into the organisational environment of design (c.f Press and Cooper, 2017), most often using applied case study methodologies, through to occupationally aligned research that focuses on professional agency. The latter approach emerged in the research as the most potentially fruitful approach that could also usefully contribute additional insights to the existing body of knowledge. However, this research is not a fully occupationally aligned project, rather it adopts and adapts core concepts in occupation to understand design work.

### 2.2 The occupational perspective on practice – design work

Connecting design work to occupation (Larson and Zemke, 2003) and workplace resistance (Courpasson, Dany, & Clegg, 2012), helps shift the focus of inquiry from social science theory concretely into two crucial and related perspectives on design doing. Occupation helps make sense of what designers do as a distinctive, human activity, while resistance helps contextualise their occupation within the workplace.

Common concepts and issues in the design literature have precedents in occupation, including the importance of meaning in doing, the role of judgement in creative work and even methods as formatted patterns of activity. The occupational standpoint potentially helps understand these various aspects of design doing and offers new kinds of insights into them too.

Emerging from its therapeutic roots, occupational science stands to understand human activity in all its facets (Larson and Zemke, 2003), work being just a subset of the broad span of doing. Larson and Zemke position the discipline as resting on the 'form, function and meaning of daily activities' and the relationship between the facets of occupation and well-being (Ibid. pp 80).

Occupational justice, well-being, health and rehabilitation and the therapeutic benefits of activity (c.f. Yerxa, 1990, Wilcock, 1991 and Pierce, 2013) are other useful concepts within the discipline that connects understanding human activity with intervening through and in it.

In terms of a totalising theory, the Model of Human Occupation (Kielhofner, 2002) offers an all-encompassing construct of human activity that connects theory to concepts and practice itself. Reconciling this model with design is an important step in advancing research in this area and at a practical level helps concretise, complex and sometimes controversial philosophical concepts within the field of practice theory including agency.

### 2.3 Professional agency in occupation

Agency is one such tricky concept that spans social practice theory, HCI and occupation (Filstad, et al, 2019) where the 'ability to act' is to 'produce an effect' (Kaptelinin & Nardi, 2012, pp 37) or in a profession oriented occupational context:

> Professional agency is practiced when professional subjects and/or communities exert influence, make choices and take stances in ways that affect their work and/or their professional identities (Eteläpelto, et al, 2013, pp 61, citing Evans, 2002)

This definition accords with this research, where professional agency connotes a purposeful capacity to build and apply skills and capability through *work production* (used as an equivalent to *doing* and occupational performance (Nelson, 1988)). Core occupational concepts of being, doing, becoming and belonging socialise and manifest a given occupation (Njelesani, et al, 2014), as Anteby (2010, pp 8) notes practitioners enact 'values in practices'. Together these and other fruitful occupational concepts combine to contextualise design work within an overall descriptive framework shown below (Unpublished output study):

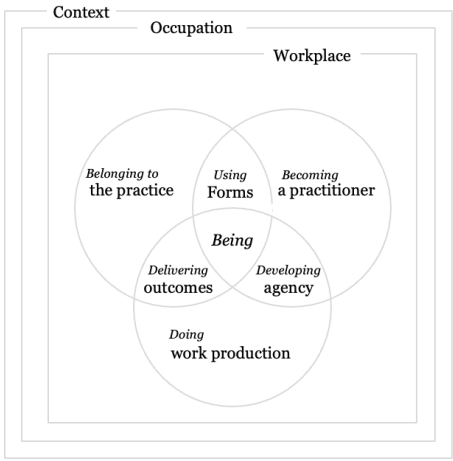



**Figure 2** Design Work Descriptive Framework showing connections between occupational constructs and work

Context refers to upstream conditions outside of the workplace and the practice, which indirectly influence the ways design is done, what practitioners do and the specific local form of production. The digital economy is an example of this high-level layer. Occupation in this research refers to a particular practice, such as design or development, which exists as knowledge and practices occurring across many instances and situations. The workplace or situation refers to the local context of practice (Morgeson, Dierdorff & Hmurovic, 2010), such as an in-house or consulting organisation. The practice frame relates to the specific local forms practice takes, in similar ways to the absolute particular noted earlier. Meanwhile, the production frame concerns the specific local form of production within a workplace or situation such as the agile form used in practice.

### 2.4 Knowledge in occupation

In line with this research and noted in the final article, learning through doing is the primary conduit for building professional design agency within individuals and teams. Hitch and Pepin (2021) point to the primacy of knowledge in occupation and in the final inquiry underpins the reconfiguration of Wilcock's framework (Wilcock, 1999) reported in the research and shown below. This puts the practitioner at the centre of practice, where positive occupational balance and well-being are predicated on conducive experiences in being, doing, belonging, becoming and knowing as a practitioner (Wilcock, et al 1991) as

shown below (Adapted from Wilcock, 1999 and Hitch and Pepin, 2021). In this case, the practitioner is not merely performing work but is active in shaping and producing it

Becoming refers to designers' personal journey to being the practitioner they strive to be (Filstad, 2014). Belonging, in an occupational sense, relates to the social relatedness practitioners gain from collaboration (Filstad, Traavik & Gorli, 2019. Doing, from an occupational standpoint (Wilcock, 1999) is the design work practitioners do. Finally, being refers to the individual practitioner (Pierce, 2001) themself.

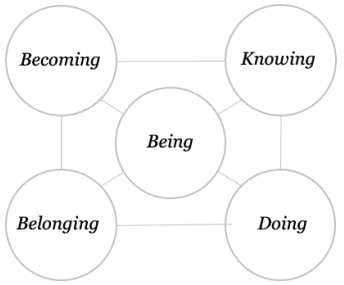



**Figure 3** Evolved occupational framework showing connecting elements of occupation (unpublished output from the diary study research referred to in article 4)

### 2.5 Professional resistance

Löwgren & Stolterman's notion of the thoughtful designer (2004) aligns with the positive practitioner resistance stance noted in this research. This kind of 'pragmatism, resistance and defending' (Goodman, 2013, pp 16) is further endorsed by Löwgren & Stolterman (2004, pp 24) who suggest that:

> Being a designer who works like this requires *courage*. It takes courage to avoid the simple solutions, to challenge the present situation, to oppose simplistic interpretations of what makes a proper solution.

The workplace literature is informative in the context of the kind of work Löwgren & Stolterman (Ibid.) note albeit with little presence in the wider design literature. Along with occupation, the workplace resistance literature offers a valuable perspective on understanding design practice in a professional context, where doing is situated within the diversity of organisations and the complexities of their specific ways of working.

Judgement and agency are two key overlapping concepts noted by Löwgren & Stolterman (2004) and Neubauer (2022) respectively that connect to the concept of resistance in this research, as:

> [Designers] must be brave and prepared to take on the resistance in a suitable way…Facing this kind of resistance can be exciting since it leads to ongoing learning and development, but it can also be frustrating and create doubt and insecurity. (Löwgren & Stolterman, pp 12)

In this research, resistance emerged as a topic in the diary study that connected the experiences of practitioners to an integral element of work, resisting or accepting the status quo is part of the nine-to-five and is thus hard to separate from practice.

The literature shows workplace resistance can take many forms (Hollander & Einwohner, 2004) spanning traditional labour relations disputes through to subtle and positively reinforcing acts (Ybema & Horvers, 2017) that have a value-driven purpose (Courpasson, Dany, & Clegg, 2012) and meaning (Knights & McCabe, 2000).

Resistance is thus an important element of being a practitioner as it manifests individuals and groups' identities (Mumby, 2005) and enables them to take 'responsible actions' (Knights & McCabe, 2000) that align with their profession (Courpasson, Dany, & Clegg, 2012). The capability to resist and that it is constituted through work to make it visible and effect change (Ashcraft, 2005) makes this topic particularly relevant to dealing with the problems designers encounter in agile.

In this research, harnessing resistance was seen as an important counterbalance to the prevailing methods and methodology paradigm for *improving design*[19]. At the same time, relying only on individual acts of positive resistance would likely fail to account for the complex range of challenges found in agile service production, again suggesting a unified approach that harnesses managerial regulation of work, remediating practices that harmonise agile and design and the positive resistance stance of the workplace literature.

[19] Löwgren & Stolterman are rightly sceptical about the possibility of doing good and as in this research have more prosaic expectations.

### 2.6 Embedding design in collaborative work practices – DT

Design thinking (DT) is widely covered in the design literature. Many topics are represented in the research that spans many differing perspectives, debates and methodologies (c.f Dorst, 2011, Cross, 2011 and 2018 and Buchanan, 1992). Endorsements by high-profile, creatives such as Tim Brown, (Brown, 2008), where the focus is on design's value in solving intractable business problems (Martin & Martin, 2009) such as service innovation (Mootee, 2013) have driven adoption in the business and technology communities too. Standardised Design Thinking activities (e.g. The 5 Whys) and latterly method toolkits (c.f Tshimmel, 2020) have helped disseminate and operationalise the approach beyond the design community further.

The benefits of DT are reflected in many studies. These include Lichtenthaler (2020) and Elsbach & Stigliani (2018), who count collaborative idea generation, enabling customer insight generation, cross-team knowledge sharing as well as promulgating a focus on end-user needs, as just a few of the advantages of DT mindsets and methods (Nakata & Hwang, 2020). Ferreira Martins, et al (2019) and Dobrigkeit, et al (2019) provide case research that shows the value of DT specifically in software development, again highlighting enhanced collaboration (Pereira & Russo (2018) via:

1) *upfront* requirements type activities,
2) *infused* activities, similar to the toolbox approach noted in the practitioner literature, and,
3) continuous insight enrichment in agile working. (Parizi, et al*,* 2022, pp 17)

The remediating potential of DT is evidenced in a few studies that show the value of collaborative creativity within teams, the potential for prototypes to communicate emergent solutions early and easily (Huber, *et al,* 2020) and moderated problem-solving (Jones and Thoma, 2019). Lastly, recent studies (e.g., Przybilla, et al*,* 2018) propose that teams employing DT not only collaborate and deliver better, but as this research suggests, structured activities help reduce the ambiguity and chaotic nature of extreme agile working.

DT methods have become an important work activity beyond software development, particularly in collaborative workshops, where group dynamics are moderated and structured activities turn team meetings into engaging, transformative and productive events. Useful outcomes of these kinds of sessions include enhanced teamwork and cohesion and crucially helping to align and make decisions (Gray, 2016).

The steady stream of new methods and extending the toolkit approach (Tshimmel, 2020) into new areas including business analysis, pays testament to the vibrancy of the practitioner community and exponential industry adoption. Together the literature and this research suggest that DT integrates well with agile, so that teams creatively collaborate at pace: Combined with Service Design this constellation of practices has the potential to make service design work better.

### 2.7 Integrating design in organisational strategy – SD

The popularity of organisational transformation initiatives coincides with the emergence of service design. However, despite some positive recent developments noted in this section,

service design (SD) practice and theory offer both divergences and convergences with this research.

Service Dominant Logic (Vargo and Lusch, 2014) puts value co-creation (Sanders & Stappers, 2008) as a product of interaction, making a fundamental shift from the transactional paradigm of UX and UI design. Morelli, de Götzen & Simeone (2021) suggest a similarly disruptive position in harnessing SD for systemic institutional transformation. This foundational connection between theory and practice is noteworthy and anecdotally follows through in service design work itself – primarily focusing design effort on enabling service value co-creation.

Service design's amalgamation of human-centred (Giacomin, 2014) research, co-design (Sanders & Stappers, 2008) and various DT style, *hands-on* practitioner techniques such as as-is and to-be blueprinting (Polaine, Løvlie, and Reason, 2013 & Stickdorn, et al, 2018) underpin its popularity as a methods-based approach. The low barrier to entry for individuals and teams adopting service design, partly due to the ease with which methods can be learned and applied is noteworthy too.

In the early SD literature, up-front research was typically ethnographic in style (Segelström, Raijmakers, & Holmlid, 2009), which presents somewhat of a conundrum. Services by their dynamically co-created nature (AKA generative services) are co-produced in the moment by active service elements including human users, this means that pre-production design outputs including blueprints can never fully represent the live service. A more agile-aligned approach would likely put greater emphasis on production, to get service analytic data to optimise and shape the next service increment (c.f Elo, Pekkala & Tuunanen, 2023).

Extending the scope of SD beyond early, largely conceptual design was also an early area of research including Patrício, et al (2011). This model appositely extends the remit of service design out from 'Designing the Service Concept' and 'Designing the Service Encounter' to include 'Designing the Service System' itself.

The *methods-based* approach 'to realize business ambitions' (Reason, Løvlie and Brand Flu, 2015) inherent to 'This is service design doing: applying service design thinking in the real world' (Stickdorn, et al, 2018) epitomizes the practical benefits of service design. Collating over fifty easy and engaging collaborative methods, the book helps practitioners gain from the kudos service design attracts, compared to less cutting-edge UX and UI methods.

A further benefit of the SD methods approach is that sessions produce work products. *Putting everyone to work*[20] means designers have more choice in where to put their energies as the crowdsourcing approach removes the need for early design origination, report writing (by and large) and separate *washup* activities, where knowledge can be lost.

Similarly to the expediency of DT methods, the value of collaborative vision building (via blueprinting sessions) is compelling and enables internal knowledge (via stakeholders) to be immediately externalised, reducing fieldwork effort and harvesting *just enough research*[21] data to progress. Collaborative blueprinting sessions, where existing and new

[20] Service designer's description of workshops from casework.
[21] *Just Enough Research* by Erika Hall (2019) exemplifies this lean approach.

services 'can be scrutinised and judged' (Schønheyder & Nordby, 2018) also help reduce later rework and foster team alignment to the emerging and overarching vision.

The various benefits of service design, centring on collaboration are particularly relevant to in-house design practices. Consulting designers need to gain an understanding of the host domain as they are external to the host organisation, whereas internal teams need to leverage organisational knowledge – a situation that makes a living service blueprint evermore useful.

Tolonen (2022) notes how this kind of internal knowledge management work aligns SD with other practices including enterprise architecture (see Jonkers, et al, 2006), suggesting a complimentary, but currently separate set of practices that could be readily integrated and help make generative service design work.

MINDS (Teixeira, et al, 2017, pp 5,) applies a collaborative approach to interaction design, again ensuring that internal knowledge is directly elicited, mapped and ideated on in ways that readily integrate into agile. In this sense, design acts as *the glue* between different stakeholder groups (Frishberg & Convertino, 2020) where designers are 'actor[s] in the design process' Meroni & Sangiorgi (2016, pp 30) involving :

> Orchestrating…knowledge, possibly bringing together perspectives that may not be represented in the mix of expert capacities in a design team. (Morelli, de Götzen & Simeone, 2021, pp 59)

Solving organisational change problems, that are common in agile adoption, is another crucial contribution service design provides. Service-initiated transformation cases (c.f Junginger & Sangiorgi, 2009), where the full multiplicity of perspectives and disciplines are brought together to crowdsource innovation (e.g., Patrício, 2018) are similarly compelling.

While there is generally a negative perception of technology in the literature, there are some notable exceptions and shifts in positioning within the SD community. These include Joly et al (2019) and Christ-Brendemühl (2022) who suggest that service technologies have a critical and contingent effect on the service experience, as both users and agents are mediated through it.

Cases supporting a more equitable position of technology in SD include Teixeira, de Pinho and Patrício (2019), who describe a closely coupled SD-driven software development mission in healthcare. Here technology and development are not peripheral to design but rather afford constraints and opportunities to define the future service from.

Similarly, Hirica ( 2021) notes the potential of automation, process mining and data-driven optimisation to ingest *service flow* data into design. Meanwhile, Fromm & Satzger (2012) and Koskela-Huotari, et al, (2021) advocate 'analytical approaches' using data science (Kunneman, Alves da Motta-Filho & van der Waa, 2022) to triangulate user study data with service analytics in a similar fashion to the *FLOW methodology* (See Terms of Reference).

Rontti, (2016) offers a rare explicit example of merging SD and agile – but only at the conceptual stage, rather than following through into production. Similarly, Almqvist (2019) proposes agile aligned service delivery roadmaps and Tuunanen, Salo and Li (2023) advocate a modularised approach, in accordance with this research, to unify SD and agile.

Lastly, Shaw *et al,* (2018) and Joly *et al* (2019) describe a service taxonomy comprising micro, mesa, and macro-level innovation that aligns with the incremental approach to production noted in this research.

### 2.8 Embedding design through data & insights – HCD/HCI

Human-centred design (Giacomin, 2014) is characterised by integrating service users' needs into design and offers a range of unifying practices within the Human-computer Interaction domain. These include concepts, frameworks, methods, theories and crucially quality and evaluation criteria lacking in SD, DT and DO.

HCI-aligned practices in design (Sharp, Rogers and Preece, 2007), digital innovation (Buxton (2007), value-centred design (Cockton, 2004), evaluation (Lavery, Cockton & Atkinson, 1997), ethics (Knight, 2004), standards (Bevan, 1995) and agile integration itself (Sharp et al, 2006) are just some of the fruitful areas of HCD/HCI research that can help make service design work better. However, compared to the high profile of SD, these valuable practices are at risk of neglect without the kinds of harmonising frameworks detailed in this research.

Newer, widely adopted SD and DT methods, feature more commonly in the practitioner literature (e.g. Stickdorn, et al, 2018) than less well-known and potentially better alternatives and additions (e.g GOMs, Task Analysis and Formal Methods, Harrison & Thimbleby, 1995), standards (e.g. ISO 9241-11 and 13407) and quality measures (e.g. usability).

An example of the benefit of unifying practices comes from the healthcare case in this research. The discovery research was effective in defining a service vision and gaining just enough research to build a prototype that could be tested. However, in a medical context, due diligence would be required to fully implement the service, as any errors, issues and unmet requirements could have critical consequences.

Similarly, detailed design work, granular-level analysis and pre-launch evaluation are critical to any regulated digital service provider, and arguably non-regulated ones too. While beyond the scope of this research, addressing the gap between high-level service blueprinting and micro-interactions is a crucial enhancement to unifying practices beyond remediating current siloed practices. The *formalist service blueprinting* approach (See Terms of Reference) offers an example of how this unifying approach could work in practice.

The above approaches (DT, SD & HCD/HCI) are complemented in practice by centralised design operating models that aim to enable innovation at scale and pace. However, there is little academic literature on Design Operations (DO) except for the role of design systems in practice noted by Churchill (2019). The practitioner literature is also quite limited with Malouf (2020) the main source of information on this topic suggesting that this research fills an important gap in knowledge.

# 3 . Methodology

A number of differing positions have been taken to research professional digital design. Foremost are those built around theory including studies on the economic context of design (Julier, 2017) and practice itself including Goodman (2013) who applied an observational stance to understanding design work. This kind of fieldwork is useful in providing a detailed description of practice at a particular place and point in time.

A second approach looks at individuals, using interviews and surveys to understand practitioners' attitudes and opinions. A third and similar tactic employs more controlled conditions and uses experimentation (c.f Stempfle and Badke-Schaub (2002).

Self-reports and guided expert interviews, usually involving small cohorts of experts, is another way to elicit insights into practice (e.g. Schön, 1983).

Lastly, understanding design from a practitioner perspective, without recourse to theory or experimentation (e.g. Löwgren & Stolterman, 2004) provides insights gleaned over long periods and from within the practice itself. This research drew on these different approaches and used a range of mixed-methods to understand design work and the wider, influencing context of digital production as detailed below:

**Table 1** Research matrix

| Phase | id | Cohort | Research & intervention focus | Method | Articles |
|---|---|---|---|---|---|
| Early stage lines of inquiry desk research, initial fieldwork, literature review & case work | Broad, large studies on design work identifying difficulties in agile | | | Workshops* surveys, experiments and agency (a) and In-house (b) case work | (1) Go with the flow |
| | a | 52 | | | |
| | b | 121 | | | |
| | c | 9 | | | |
| Middle stage fieldwork & case work | Multiple small, focused studies on granular issues in agile and potential solutions | | | | |
| | d | 14 | Design judgment issues | | |
| | e | 5 | Mission types* | | |
| | f | 6 | Client needs* | | |
| | g | 24 | Policy issues* | | |
| | h | 102 | DT adoption | | |
| | i | 19 | Mission types* | | |
| | j | 40 | Seniors' work | | |

| | | | | | |
|---|---|---|---|---|---|
| | Narrower focus on occupational experience and resistant behaviours and remediation | | | Diary study, ESM and case work at agency (c) | (2) Unlocking Service Flow & (3) Do it Fluid |
| | k | 42 | Flow methodology development, occupational experience research and remediation and resistance approach | | |
| Late stage fieldwork & interventions | Wider focus on exploring intervention and testing the three harmonising frameworks | | | In-house case work (d & e) and interventions | (4) Hexadecimal Factory |
| | l | 13 | Foundation practice definition | | |
| | m | 8 | Flow methodology definition | | |
| | n | 57 | Centralised design operations framework definition | Online survey | (5) Resistant and Remediating Design |

Initial lines of inquiry were explored through desk research, a literature review and casework. This discovery phase informed later fieldwork and helped to progress the inquiry via three foundational studies (a,b,c). The choice of method at this stage was driven by the need to cast a wide net to identify issues across design and development in different kinds of organisations. While the surveys were somewhat limited in their capacity to capture qualitative insights, the approach maximised participant numbers and geographical reach. Verbatims from the surveys were analysed and stress emerged as a strong theme in the data – but the extent, attributable cause and response to these kinds of experiences was unclear.

A number of workshops (e,f,g & i) were then conducted, together with two surveys (d & h) in the middle stages of inquiry that probed the value of design thinking and senior designers' practices (j). The choice of method at this stage was based on the need to dig deeper into issues elicited in the surveys with smaller groups and using more qualitative methods.

The workshops and surveys helped gain quantitative and qualitative data which helped surface deep insights and substantiation of core concepts through responses from a larger cohort. This phase of research helped to move from understanding the broad context of design within agile development into the specifics of design work (See Terms of Reference).

Defining specific research questions for the next phase of fieldwork, involved reflecting on the first tranche of findings and exploring related literature and theories that helped connect insights to the emerging theme of occupation. There were gaps in the early research too, that needed further exploration and a shift in methodology to gain more qualitative insights. A crucial gap in understanding was a lack of data on the felt nature of work, as the more structural aspects (e.g. method use, project type and durations etc) had been identified sufficiently (See Hexadecimal Factory article). This shift of direction prompted running a diary study (k), which helped bridge the gap in the early research and was chosen to gain longitudinal data from a geographically distributed cohort.

This research also involved in-person research and interventions, which were developed throughout the research and were trialled and iterated resulting in the *foundation practice, Centralised Design Operating Model* and *FLOW methodology*. This work progressed in the final two cases (d & e), where the frameworks were designed and tested in-house. Further research, beyond the scope of this research, is needed to fully substantiate the efficacy of the various frameworks in differing contexts and agile forms.

### 3.1 Surveys

Online surveys were used in the early and late stages of the research. Participants were recruited directly using social media platforms to identify representative individuals with prize draws used for incentives. In all cases, the surveys were designed, run and analysed using an online questionnaire platform.

Data was then tabulated into spreadsheets for thematic analysis. The type of analysis performed on the data depended on the stage of inquiry. The early study data was open-coded as the focus was on broad theme identification, whereas the later stages involved ever more sophisticated quantitative types of analysis such as Pearson correlation.

Early surveys were relatively simple in design. In most cases they used Likert scales to collect data about agile working, for example, participants' views on the relationship between agility and innovation, creativity and collaboration (a,b,c) were explored in this way. These surveys were repeated with different cohorts in the early research, including with designer and then developer cohorts, and in some cases also re-run over several years to understand if attitudes changed over time, albeit with relatively small sample sizes.

Additional questions were added too, as emergent issues were identified which were not the primary focus in the early stages but warranted further investigation as insight progressed. These probing questions aimed to check on the general direction of the research as findings surfaced. For example, questions about occupational imbalance were introduced after the first couple of surveys as this had come through in the initial data coding.

The main value of these early surveys was in the participants' comments. These were collected with each of the survey questions and data provided a rich source of qualitative insights. Second-stage surveys were more quantitative in design and aimed to understand the frequency, value and application of digital design methods, tools, and practices. The final phase of survey research aimed to stress-test the overarching conclusions of this research including the remediating practices, with positive results via a final late-stage questionnaire.

### 3.2 Diary studies

Digital diaries were used in the later stages of inquiry (k) using the same recruitment approach as the surveys. Each participant was given a unique and secure online workspace that included activity descriptions for them to complete and space for data entry in the form of interactive tables, pages, and forms, depending on the task at hand.

The four-week diary activity was divided up into three smaller studies. Two weeks involved participants responding to moderator prompts as per an adapted Experience Sampling Method (Larson & Csikszentmihalyi, 2014). This sought to capture respondents' current work tasks and occupational state *in the moment*, via high and low state descriptors which were iterated and tested over the course of the fieldwork until a stable set was defined. The third week entailed respondents contributing to a co-authored narrative that described a typical agile project and captured key events, characters and points of conflict and unity. Week four involved participants keeping a reflective diary of significant events (if any) that had occurred at work.

The resulting transcript and tabular data were combined and were then transferred to spreadsheets to perform open-coding to derive themes, nodes and facets. Provisional findings were shared with participants through three video calls where they contributed further insights to the group as well as feedback on emergent themes and intervention concepts designed during the analysis.

### 3.3 Casework

This inquiry included first-person research in service design work (case a, b, c, d & e) and involved several projects. Two of these projects are detailed in the articles, including the agile service design healthcare and the conversational service design publications. Other projects are described below to show the evolving work on developing remediating approaches to agile with specific examples detailed where possible. Detail on the casework methodology itself is included in the final article.

In case a, this method was used to understand a consulting service design project. Here, service blueprints were generally large, wall-sized, high-resolution paper representations of the future experience. These outputs were the result of user studies and stakeholder and end-user workshops carried out over many months. Data was collected and *workshopped* by the team into low-fidelity versions created on the agency's wall spaces similar to the many sticky-note populated blueprints seen in the practitioner literature.

These rough blueprints were then digitalised into high-quality printed versions. Focusing on the user's interaction with the service, this process followed the convention of mapping touchpoints and front and backstage activities. As well as visualising the future service, the blueprint collected useful inputs for agile development, embodying the vision and points of interaction of the service, albeit without the micro-level detail (e.g. screens and content) needed for full production. This project indicated that service design, while useful in co-designing and documenting vision, was less readily applicable to agile service production.

In the second case (b), service design was condensed into a short (4-week) in-house *accelerator* project. This work was much more focused on service realisation and aimed to improve the experience of an existing digital lottery service as quickly as possible. As well as blueprinting, the work also tackled service touchpoint improvements at an atomic level (e.g. high-resolution screen designs). These outputs were researched in parallel to design and development activities and supporting studies included engaging with customer support and running a series of user studies and co-design sessions.

Service analytics (*service flow data*) was also collected from several sources and used in design and development. The various activities and outputs of this work were then used to create a roadmap that informed the development backlog and future direction of the service experience. There was no high-fidelity blueprint produced in this project. As with the first case, a large, low-fidelity paper version in the team's studio was used as a working document for mapping current understanding and potential solutions. This was used to inform the redesign of key service touchpoints that were developed over the course of the short project lifecycle. This project indicated that agile design work could be unified so that the strengths of strategic service design could be fused with sprint development in principle.

The penultimate case (c) related to the healthcare article and, similar to the second case, stretched over a number of weeks rather than months. Similarly, this project also focused

on short-term gain as well as providing a high-level longer-term vision and roadmap. Co-design methods were used extensively in this project and proved particularly valuable in eliciting and sharing service user needs from several different and specialised cohorts, including general practitioners and patients.

As with the lottery case, the technology stack was mandated at the start. This accelerated delivery, reduced design and development rework and costs and proved productive in synthesizing agile and service design working practices as the technological capabilities were a fixed element. This case was also used to trial early versions of the Flow methodology for conversational service design.

The final case took a different direction, as an initiative in service design adoption within a large, multinational technology consultancy (Case c). Here, the focus was on building a *centralised design operations* capability to help generate service design project work. This involved crafting and running *foundation practice* training as well as documenting role descriptions and work formats that defined the practice.

Hands-on work involved helping practitioners craft existing and new projects into agile aligned service design work and also finding ways to build out staffing on existing projects and extending lifecycles. Anecdotally, the consulting mindset helped practitioners connect business needs to design and contributed to positively *growing the practice*. In a *trusted advisor* role consulting designers are often more proactive in identifying opportunities and shaping work to meet them than their in-house peers.

There was a negative impact of this initiative too. Preferring more meaningful and thus more rewarding strategic-type missions, practitioners became less willing to work on smaller tactical ones. However, overall, the work helped to elevate agile service design within the consultancy and client base and also helped to incorporate HCD practices into these kinds of missions.

A number of service design missions resulted from this work, which tended to be short (two to four weeks) and unified design into agile production well. Rather than building out blueprints from research, as would happen in waterfall, these missions tended to co-create them, initially via remote internal stakeholder workshops that created interactive, digital service blueprints (via digital whiteboards) that could be iterated at increasing levels of granularity in individual and group work sessions.

Using digital whiteboards, drastically reduced production time and also increased the granularity and accuracy of as-is blueprints, as they were the product of direct stakeholder and use input. Digitalisation also meant that evermore layers of data and detail could be added, moving design work from physical blueprinting to facilitating remote working, with the fullest organisational involvement and user validation.

Unlike the first case, the host organisation used emerging blueprint versions to check, estimate, refine and realise service technical feasibility and requirement traceability with a broad set of stakeholders, including software development, business strategy and operational staff. This meant that blueprints helped fixate work on strategic gain and surface dependencies before they emerged in production and also reduced the load on change management as the service was co-created. Blueprints were a key discovery phase deliverable, catalyst for collaboration, and living document of the as-is and to-be service thus becoming a *single source of truth* for forthcoming agile production and operations work.

## 3.4 Analysis

The primary method of analysis in this research was qualitative. The exact procedure for each study being documented in the individual articles, albeit with some commonality in approach across the various studies. This evolved from survey comments analysis, where a large amount of participant verbatims created a sizable corpus that could then be thematically analysed. The primacy of text data, whether from comments or more formally elicited through collaborative narrative generation was used regularly in this research and contributed to the exploration of card-based research and design that culminated in the FLOW storycards and methodology.

In the early cases, this was a relatively simple process of grouping responses (at sentence-level granularity) into categories. This was effective given the relatively small size of the corpus and the initial focus of analysis in identifying broad topics for further research. Knowledge, at a general level, for example, was identifiable in the data whereas deeper and more nuanced insights into the differing kinds of knowing, and other findings were less obvious and only emerged through scrutinising the corpus more methodically.

The need for more thorough analysis was also driven by practice. In particular, the healthcare service design project (Knight, et al, 2019) necessitated aggregating a diversity of information from many sources, including somewhat unusually for a commercial project, gathering insights from a literature review. As with many elements of this research, casework and empirical investigation progressed in tandem.

Data collected through various sources and fieldwork activities, including feedback from different user groups was documented as single items on *storycards* before being collaboratively analysed by the designers and researchers on the project. This took place in a physical studio space over several days and continued until a perceivable *saturation point* was reached. This involved manual iterative card-coding, theming and framework modelling until all of the data was accounted for and themes were stable, well-defined and provided strong insights.

In the final analysis in the healthcare case, service adoption was considered to be predicated on a critical mass of distinct user groups, each with specific needs that the service needed to provide via three increments. This finding was not anticipated or considered (via a research question) at the start of the research but emerged and changed the direction of the work.

Anecdotally, the kind of formal and structured approach used in the case research helped reduce later rework as stakeholders were bought into the process. This suggests the efficacy of these kinds of formalised (HCD/HCI) ways of working and the power of combining these kinds of methods with looser and more collaborative service design activities.

The healthcare context also influenced the approach to analysis by adopting a more formal Framework (Ritchie and Lewis, 2003) approach. Figure 4 shows the various fieldwork activities on the left and the process of analysis on the right, while Figure 5 shows a mid-analysis thematic coding model, based on one of the data sources (interview transcripts) that informed the final output (Figure 6). This included analysis of all of the data from the fieldwork and literature review, combined into an overarching release (threshold) framework that helped to define a service innovation roadmap.

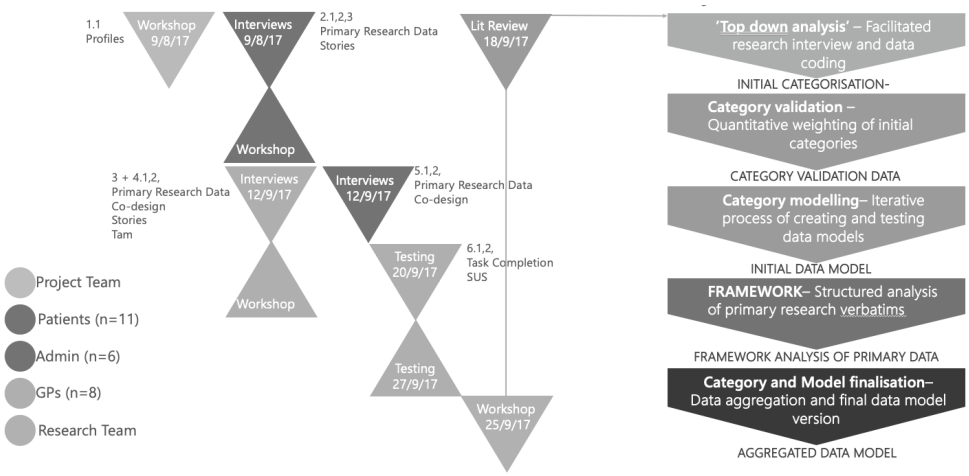



**Figure 4** Research activities

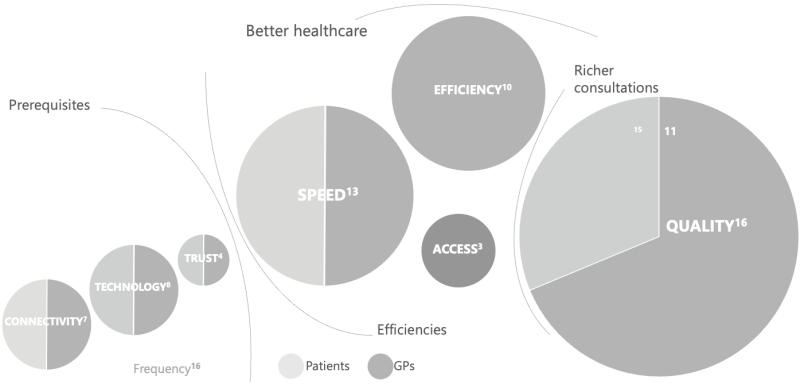



**Figure 5** Mid-stage analysis output

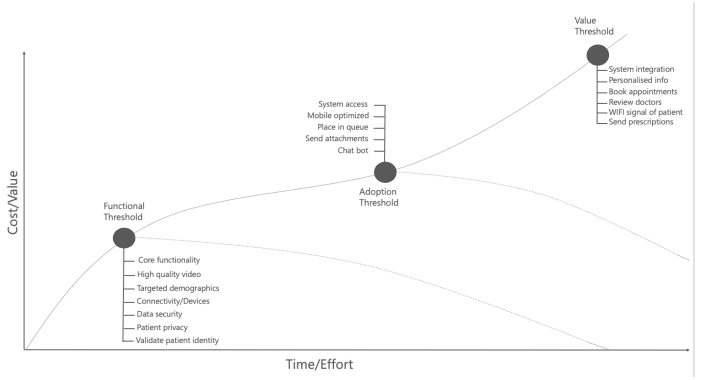



**Figure 6** Final analysis service threshold model

The healthcare project and the method of analysis that evolved from this phase of research influenced the next phases of the inquiry. This adapted approach was developed to account for multiple data sets, primarily using textual data, that were recursively themed through

*cuts*.[22] In the diary study case, this recursive process went through three cuts to fathom a corpus created from participants' daily entries and distributed authoring activities. This corpus was 'cleaned' to remove any formatting and non-relevant (i.e. not directly relating to the focus of inquiry) content. Then the text was separated into individual utterances as *storycards*, which were then used to create the first cut, mapping cards to an open schema that evolved through the coding. This was then repeated (see below) until a saturation point was reached that provided a three-level categorisation schema of themes, facets and nodes:

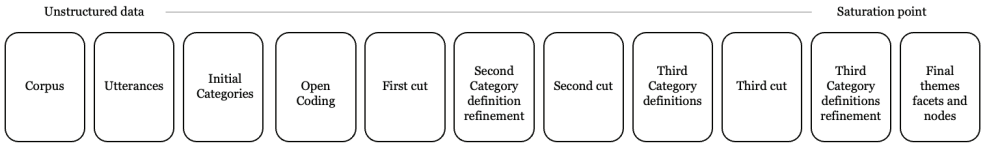



**Figure 7** Framework analysis approach

## 3.5 Limitations

There are many limitations to this research, particularly in participant recruitment, the relatively loose methodology and the need to extend validatory research - all of which are detailed in the full articles. The first study involved research with a small team and so there is a limitation on how well the findings generalise given the small sample size of the supporting study. The second study had similar limitations in terms of cohort size. The third and fourth articles' research involved participant recruitment so sample sizes were larger although the self-selection method, with some respondent qualification, was less than ideal. While these limitations hold true, the combination of methods, varying cohorts and structured analysis go some way to bolster the quality of the empirical work supporting this dissertation.

22 Refers to stages of saturation in analysis where one phase is frozen and forms the content for the next cut.

# 4 . Article summaries

## 4.1 Agile literature review and design integration issues

### *Go with the Flow: Accelerated Digital design in the Age of Post-agility*

This paper formed the foundation for the casework, fieldwork and interventions that followed. While agile and design have attracted a great deal of attention, this research identified a gap in the literature's coverage of agile as a new and distinct mode of production. Likewise, the concluding recommendations for unifying agile and design deviated from the norm, in identifying remediating factors across both domains, rather than trying to change the fundamentally generative way agile works. Agile service production work is described in detail in the paper, as are constraints and opportunities for a more unified approach and descriptions of common work practices.

A comprehensive literature review was carried out on agile, digital design and integration approaches as well as fieldwork, involving studying practitioners who had adopted agile from waterfall. Interviews were conducted at a digital agency, with designers (n=4) and the wider project team (n=12). The findings helped identify a number of constructs and a descriptive theory framework, that positioned agile design as a collaborative, goal-directed activity that comprised; *Missions* that in turn created knowledge, capability and value (*Professional agency*) that realised clients', practitioners, and users' needs (*Vision*) at pace (*Velocity*).

These findings tallied with other research on agile design, including the complexity of designers' roles (da Silva *et al*, 2013) and their involvement often invisible, ancillary work (Daniels, 1987). Also in line with the literature, this study indicated designers' contribution tended to focus on low-value production activities.

In this early article, ways to remediate extreme agile were conceived at a conceptual level of improving design flow through methodology and harmonising practices, themes that continued into the later stages of the study. Research-based recommendations included extending the range of *stories*, *use cases* and *epics* covered in agile ticketing taxonomies, so that they might help ingest holistic customer needs into sprints better. Broadening the type of sprints was also proposed as a way to help balance piecemeal scrum tasks with more strategic work as well as enabling teams and clients to self-determine the focus of sprints more collaboratively.

Embracing and evolving non-practitioner scrum master roles, within cross-disciplinary teams, so that all team members could experience crafting activities, was also suggested as a way to help embed self-organisation further. Building on the unique capabilities of design and research to enrich and visualise data, the article recommended that practitioners could

externalise pertinent insights, including analytics and market research, to support agile teams. This proposal developed through the research and influenced the foundation practice approach that also focused on elevating the value of design research data. Extending this capability with a dedicated design research role, working across missions to voice customer needs, providing triangulated data for decision-making and developing deep service knowledge across projects was also recommended. This was a precursor to the centralised operations model developed later in the research.

The combination of theory and developing practical ways to remediate extreme agile continued through the articles. A key contribution towards the overarching conclusions was in identifying professional agency as a discernible and important factor in agile working. In tandem with formatting proposals for activities (e.g., Design Sprints), these two factors together formed a central thread through the later research to make agile service design better.

### 4.2 Service production and unifying agile and design

*Unlocking Service Flow: Fast and Frugal Digital Healthcare Design*

This article was based on a healthcare service design case that enabled online consultations between healthcare professionals and patients, thereby increasing access to primary care, particularly for hard-to-reach patients and those with stigmatised conditions. This service offered cost and time savings, improved convenience, streamlined operations and provided better and more secure data protection measures than at present. Most importantly, however, online consultations could improve healthcare by expediting diagnosis, reducing contagion through physical contact, and offer better diagnosis through shared service data and enhanced triaging capabilities.

The literature on the potential benefits of e-consultations is emphatic, even before COVID-19. E-consultation studies evidence the broader social potential of e-health (e.g. Ball & Lillis, 2001), enabling patients to be *pre-informed* (Wald et al, 2007) within a *partnership model* of healthcare (Charles, et al, 1999).

Research was conducted to help design the service during a short (three weeks) discovery phase. The project then progressed into service design and development itself using an ad-hoc form of agile. The project's short time span diverges from extensive upfront research-oriented service design projects (Vaajakallio, , Kronqvist, & Mattelmäki, 2013) and instead, a unified approach was used that ensured that just enough research and design was done to prime development, without spiralling into waterfall style staged requirements gathering. Specific methods that helped design at pace, included design thinking-led collaboration and co-design activities that contributed to defining strategic-level roadmaps and service experience visions.

Specific contributions from this study included the development of agile service design and delivery frameworks (AKA centralised operations) and the use of *storycards* which underpinned the first iteration of the FLOW methodology.

The concept of service flow was also introduced in this article as well as extending the remit of design beyond concept to production and operation tasks also sets this research apart from the existing literature. Service flow was loosely defined in the article and is a further example of the value of HCD and HCI-aligned methods and focus on measurement complement service design practices. In the article, service flow is defined thus:

> An aggregated measure of service quality. Service Flow is based on value-in, exchange, use, experience and context data pertaining to a specific service.

Learnings from the literature and the project helped to form an agile service design roadmap taxonomy that underpins the FLOW methodology. This is founded on three *service realisation stages*, starting with a Minimum Viable Service (MVS) that enabled access to a simplified, stripped-down version of the service. Having established a strong and sustainable user community via an MVS, the next service increment focused on delivering a Minimum Generative Service (MGS). This centred on delivering an optimised experience, that drove broader adoption and enabled more data harvesting from more users, enabling service optimisation across a wider variety of touchpoints. Finally, a Minimum Sustainable

Service (MSS) focused on facilitating value co-creation, enhancing interactions through an optimal blend of technology and human agents and enabling operational excellence to go beyond as-is service flow levels. Operationally, continuously harvesting service flow metrics and data *in-service*, meant that all design, development and operational activities could focus on optimising the quality, throughput and frugality of service production.

Common to agile development projects that begin with an initiation phase, this agile-aligned case started with a mobilisation phase. Having established core enablements, involving some pre-discovery activities, work then progressed into ever deeper levels of detail on the as-is and to-be service. This work also explored the technical context, looking for ways to reuse existing platforms and assets and map out the service architecture in terms of data and functionality.

Cost benefits and their relationship to maximising service flow were investigated through strategic business case building in this phase too. Lastly, existing knowledge across the organisation, and from the technical and design viewpoints, was collected and used to elaborate initial service visions and roadmaps that moved from the current situation to a future, feasible and valuable sustainable service.

From going live, effort and focus shifted to operations. Here ever more accurate service flow measurements could be collected and augmented with triangulated data from user research, service analytics and customer satisfaction surveys. This then provided quality and value calculations that could be computed against the cost of provision and operation to provide benchmarking data and found continuous service improvements.

### 4.3 Flow methodology and service innovation

## *Do It Fluid: Innovation in Smart Conversational Services Through the Flow Design Approach*

This article developed the *storycard* approach of the previous research into the novel domain of conversational services. This research also elaborated a service innovation approach and highlighted the need to reassess the role of technology in service design, with the conclusion that a tighter relationship would help deliver better services quicker. The evolved FLOW methodology was described in detail and extended to cover innovation and production in more depth via pre-design envisioning.

The rapid growth of conversational services has catapulted what was a niche area of Human-Computer Interaction (HCI) (Carlisle, 1976) research into the mainstream, so that nowadays, conversational devices, platforms and services, aimed at and adopted by mass audiences are now increasingly commonplace. Applications of these kinds of services range from relatively small, Voice User-Interfaces (VUI) applications on mobile devices through to full-scale transformations of public services enabled by voice technologies.

Healthcare is a particularly promising domain for conversational interactions, with the potential to increase accessibility, reduce the need for physical touchpoints and increase consultation speed and quality.

While conversational interfaces have become pervasive, relatively little research has been done to unify agile and service design methodologies in this domain. Enabling services through technological innovation is somewhat lacking in the literature too, this chapter outlined the relevant contexts contingent on success from a holistic perspective. First, the technical aspects of delivering conversational services were tackled. Then the business context was explored, with a focus on overcoming the barriers faced by organisations wanting to make use of technological opportunities in this area. The final section discussed the service domain itself. These three perspectives were harmoniously operationalised in the methodological conclusions made at the end of the article.

Service design potentially contributes to the opportunity for voice interaction by offering a way to orchestrate human and non-human agents into valuable generative services. On the negative side, the rapid adoption of new technologies including ChatGPT, risks reducing the relevance of less technologically aligned design practices.

The practical focus of this paper helps to bridge this gap potentially by breaking with the visual paradigm of design by using text as the service experience is conversational. The applied FLOW methodology covers four innovation modes that are attuned to the risks and opportunities in conversational service design. These comprise Service Value, Service Efficiency and Effectiveness, Service Experience and Service Extension modes. These are outlined and operationalised through formatted work activities. The methodology starts with agile-style envisioning sprints that determine the necessary technologies, processes, tools, and resources needed to deliver the service vision. The second sprint defines desirable high-level service attributes, develops future service scenarios and moves to production via storycards. These can be enacted and modelled before and during production and help define early concepts, features and hypotheses. Cards are then iterated over the course of the project in refinement sessions so that they become living requirements that evolve

atomic-level requirements and conversational service elements over time. Stakeholder, user and delivery team sessions capture, plot and refine cards directly on as-is and to-be service blueprints so that they become a single source of truth that can be referenced at any point in production.

### 4.4 Production design work fixes

## *The Hexadecimal Factory - Design Work in the Digital Economy*

This empirically based article explored findings from the early stages of inquiry. The study aimed to understand designers' experiences in agile and identify potential means to improve their occupational experience. The elicited data gave insights into the connected topic of knowledge that helped understand the limitations of solely relying on structuring chaotic work (through methods) without accounting for individual agency.

This article sought to assess the importance of digital design, given its' relatively low standing in the literature. Bukht and Heeks (2017) contend that the digital economy contributes at least 5% of GDP in most developed economies in their studies. Creative workers are employed in a diversity of occupations within the sector, including jobs in software development, which also consumes creative labour involved in shaping technology into useful and usable interactive products and services for consumers and citizens.

Data from the supporting studies in this research was analysed by thematic coding of transcripts, interview notes and verbatims. The results indicated a predominance of agile production methods in a variety of forms, three types of missions spanning tweaks to transformation and several differing roles designers take in service production.

The negative effects of agile were a strong theme in the data. This was reflected in insights into the often relentless pace of sprints, the pressure of sequencing and producing deliverables across multiple workstreams, marginalisation, rework and a prevalence of unrewarding tasks designers perform within extreme forms of agile.

Further and more focused research was undertaken to home in on the experience of creative work at an occupational level. Forty-two subjects completed diary tasks over four weeks. Participants co-authored a five-act narrative about a typical mission which provided transcript data for qualitative coding. Provisional themes, codes and facets were developed and then tested until a stable set of themes were identified and judged stable through to the final analysis.

The data surfaced an emergent theme of knowledge. Four nodes were distinguishable within the relevant data set, comprising Ken[23], which connoted a totalising abstract kind of knowledge related to the broad body of design knowing and theory. Craft which referred to knowledge built on context that was contingent on interaction with others and previous experiences; this is where formats and methods sit in practitioners' knowledge. Knack related to the physical and mental prowess involved in doing and was the third facet within the theme. Lastly, Nous was a strongly represented node in the data and referred to the kind of cunning *practical intelligence* used in improvising everyday work. These facets accord with those noted by Löwgren & Stolterman (2004).

[23] There are no directly equivalent terms in English for these nodes and so the nearest colloquialism was used.

The findings final contribution suggested a more fundamental and surprising conclusion in connection to Wilcock's framework (Wilcock, 1999). In surfacing the importance of knowledge, as both work resource, capability and enabler in occupational balance, the findings indicated that being, doing, becoming, and belonging are underpinned by knowledge. This may not necessarily be the case in all occupations and perhaps as information workers, designers are particularly predisposed to this kind of knowing, compared to more traditional occupations where physical activity predominates. This finding concurs with Hitch & Pepin (2021) who also extend Wilcock's framework into knowing.

A practical consequence of the findings on knowledge was to validate the *storycard* approach. Cards reduce the rifting impact of silos as they manifest emergent knowledge in a form that readily fits into design and development workflows. In particular, the collaborative writing exercise indicated that this method was potentially valuable in eliciting insights and directly creating conversational service narratives quickly.

### 4.5 Unifying design and agile practices

## *Resistant and Remediating Design*

This paper extended the consolidated findings of the other papers into a final stage of inquiry. This aimed to gain an inclination of validity of the overarching direction of the research to date, including the efficacy of the remediation and resistant design strategies emergent in the formative studies. In addition, the article added a much needed literature review based exploration of appropriate methods of inquiry for design work, evolving the first-person research approach used in other studies.

The main empirical focus of the article centred on a comparison of in-house and consultancy-based designers' working methods and levels of job satisfaction. Based on the candidate remediating methods it sought to understand similarities and differences between the two work contexts and surface potential correlations between work practices and occupational balance.

In this study, the unifying four 'D' *foundation practice* was defined to tackle specific negative issues found in agile service design work. Firstly, a lack of vision was addressed through collaborative service blueprinting (D1). D2 centred on design thinking to aid cross-team knowledge sharing and direction. Meanwhile, design operations (D3) helped designers integrate into continuous delivery. Lastly, D4 mitigated risk through human-centred design research, formal methods and measurement.

To understand the potential contribution of these combined structuring methods an online study was conducted. Participants were recruited through a professional social media platform and involved contacting people who described themselves, on their work profile as a designer. Fifty-seven subjects were selected down to complete the questionnaire and the cohort included thirty-seven consultancy workers and twenty in-house respondents with a range of tenure and demographics.

The results indicated a positive and significant (.99) correlation across all data points, suggesting the foundation practices enhanced respondents' overall satisfaction with their work. Significant differences between consultancy and in-house participants' responses were also identified, adding further evidence to the uniqueness of in-house digital design practice. Consultancy workers were more satisfied at work and formatted their work better than their in-house peers did. In the final inquiry, this article helped endorse the overarching approach to making service design work better through a unified approach.

# 5 . Conclusion

This research addressed the lack of studies on in-house agile production design and points to significant differences in this kind of practice compared to the literature, notably in the influence and role of agile on design work. This means many employed digital designers work in intensified and industrialised forms of practice, which contrasts with the experiences of practitioners noted in past accounts of practice, when interaction design prevailed in industry. The challenging context for design nowadays can be improved at three levels. Firstly, individual practitioners' positive resistance through work, that aligns with their own and their team's professional values contributes to design integrity. Secondly, remediating practices enhance project work, while centralised design operations help unify and rationalise teams' work.

### RQ1: How does design work with agile service production?

Answer: It depends, as there is a wide variation in levels of integration and differences in design work compared to the literature. Understanding these inconsistencies is the first step in knowing about the potential of integration.

The findings identify new kinds of design work, that are marginally covered or even absent in the literature. Today in-house practitioners perform traditional up-front strategic level activities, in similar ways to their predecessors, as well as working closely with developers in production workflows, to build out and maintain digital products and services. This extends practitioners' responsibilities and adds complexity and range to what they do, particularly in in-house practices, where service design work is ceaseless. In this context, design is always there, never done and designers are continuously on call to do varyingly creative tasks, from small tweaks, and middling missions through to strategic service innovation.

Casework in both in-house and consulting contexts identified three distinctive modes of design work, which were examined in further detail in the diary study. Middle work was prevalent (74%), compared with the distinctively lower frequency of tweak (12%) and strategic mission (14%) type work respectively. Mid-level missions were the trickiest, as they often lacked the investment and alignment typically found in strategic missions (Knight, 2019). These more sizeable engagements gifted designers some latitude and slack, as well as giving them opportunities to influence the direction of the work and gain from the professional rewards high visibility projects command.

Additional related findings that came through this research indicated several non-functional design work roles. These included tasks relating to solving thorny *judgement* issues, complex stakeholder moderation duties and operational activities inherent to teamwork[24]. Löwgren & Stolterman (2004, pp 166) and Gray (2016), note a similar draw on designers, where *instrumental judgement* and *thoughtfulness* are needed to progress work, underlining the occupational and operational nature of these kinds of activities.

Designers were expected to deal with the ethical direction of production and consequently had an assumed responsibility to humanise technology[25]. This was often informally delegated to them as well as being initiated by practitioners themselves in resisting potential harm to service users and in advocating good through their work. Quality assurance was a second non-functional area of work designers were informally expected to manage. This gave them a gatekeeping role in release acceptance, principally because they had the fullest understanding of how the service ought to be, compared to their developer colleagues. Anecdotally, however, in most cases, quality assurance work by in-house designers is at the surface level of checking for *pixel-perfect* implementations, rather than more strategic considerations, despite them having views and ideas on broader topics.

Other jobs identified in the research stretch conventional design roles into wider professional and organisational types of work activities. These kinds of supporting work tasks included consultant and intermediary[26] roles as shown below (Unpublished output from the diary study research). The open design role is an interesting evolution of SD style co-design, where practitioners shift the burden of work to others in similar ways to the *Everybody Designs* thesis (Manzini, 2015).

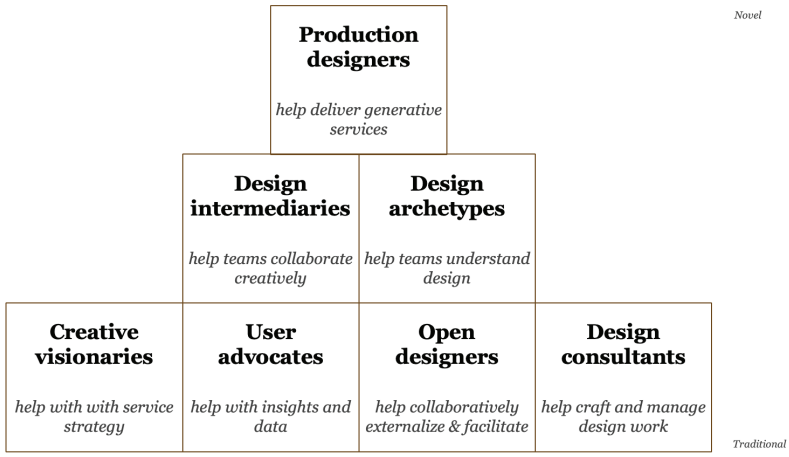



**Figure 8** Production design roles

[24] Study k.
[25] Study d.
[26] Study j. 'Facilitation of enterprise nightmare'.

### RQ2: How do digital designers deal with agility

Answer: Differently, as there is a wide variation in designers' occupational experiences of agile and differences, possibly correlating with seniority in how they deal with tricky agile situations.

The early research found that stress was a common element within designers' occupational experience, while later research extended this finding out into defining designer specific occupational balance factors and the occupational experience framework, detailed in the fourth article. A consistent insight across the research was that designers generally experience agile negatively. Discord within multidisciplinary teams, fast-paced work, compromised quality, the prevalence of rework and general disempowerment came through in the literature and fieldwork. Similarly, the common servicing model of in-house design, which focused on producing *assets* rather than strategic direction, lessened ratios of more rewarding and meaningful work compared to more mundane activities (c.f Berg, Dutton & Wrzesniewski, 2013, Woolrych, et al, 2011 and Mäkinen, Hyysalo & Johnson, 2018).

Ways to achieve positive occupational balance, gain from the benefits of agility and reduce the negatives were identified in practice and developed in parallel to deepening understanding of designers' experiences. At a practitioner level, this involved using their ingenuity to thrive and resist, whereas at team level remediating practices helped *de-stress* and *de-risk* the work. For large teams, more operational clout was needed to make service design work better.

### RQ3: How can service design work be improved?

Answer: No one size fits all in agile improvements. Instead, a multifaceted approach is needed where differing work situations and forms of agile are considered and multiple controls are applied via the practice, practitioners and leadership to improve design flow.

The key **contribution to practice** of this research is in answering this question. Developed out of the casework, that explored ways to improve designers' lot in different agile forms, addressing the tricky nature of agile and ameliorating the negative tendencies in production work are key contributions made in this research. The resulting unifying approach combines frameworks with individual practitioner resistance to make service design and agile work better. The remediation and resistance approach differs from past integrative proposals, however, in focusing on the specific challenges of extreme agile in the context of service production.

Other proposed integrative approaches take less account of the differing forms that agile takes in organisations and the impact of adoption on teams and individuals. Successful design and agile integration is not just a methodological project of mashing practices together, but instead is ongoing (continuous) change to and *in the work* across different disciplines, requiring accounting for the human as an active professional agent in practice. Extreme forms of agile need a more robust operational approach to help unify practices by applying management structures, such as the *centralised design operations frameworks* to

achieve pace, strategic gain and wellbeing. Building on the extensive literature on integrating agile and design, this research contributes a unified approach that is attuned to the specific forms agile takes as shown below:

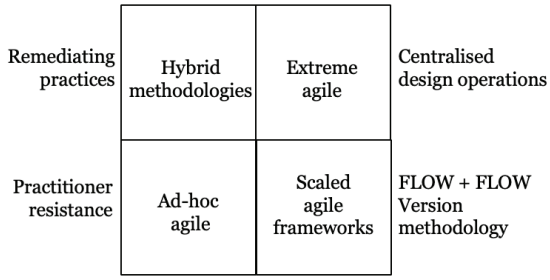



**Figure 9** The unifying approach to differing agile forms

The potential for service design to make a positive contribution to organisations was identified in the early research on agile service production in the healthcare project. The early version of the FLOW methodology evolved traditional service design approaches to be more aligned with technological innovation opportunities, continuous delivery and to be more resourceful in taking a frugal approach. This leaner approach was counterposed to the convention of carrying out extensive upfront research and design and for the scope of design work to be limited to blueprint documentation. Instead, the proposed methodology aligns with a continuous delivery approach, built on generative service increments that are developed through collaborative blueprinting using a common language of text-based cards. The storycard approach helps break down silos while also facilitating knowledge exchange. While using sticky-notes, cards or tokens (c.f Goodman, 2013) is not revolutionary, elevating and incorporating them into production workflows increases their value and importance.

The potential of this approach was extended in the third article which applied FLOW (see Terms of Reference) to generative conversational services, with greater emphasis on continuous optimisation and data enrichment through automation.

The FORM Design Service Production Framework (see below, unpublished output from the casework research) used in the latter cases helped to scale design work so that teams can gain traction at all levels of the organisation and benefit from organisational support that reduces practitioner's non-functional workloads and centrally organises work, removing the need for designers to be assigned within individual sprint teams and the negative effects associated with isolation[27] experienced in distributed working.

These four recommended practices within the framework, extend the crucial role design plays in organisations, where practitioners perform intermediary roles as the glue between different teams. Together the findings on designs' role in aiding innovation helped make practical recommendations on recasting service design to be better attuned to technological innovation, continuous delivery and operational management of differing forms of agile work demands.

[27] Study j. 'Designer can get isolated in scrum and meta topics are more work to align'.

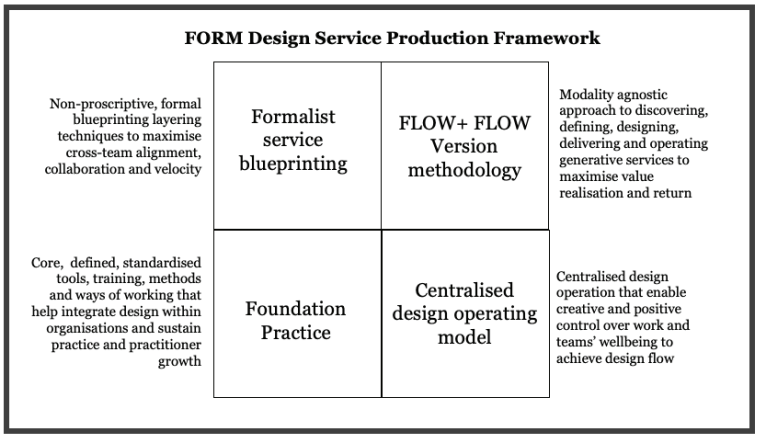



**Figure 10** FORM Design Service Production Framework

## Contribution to theory

In highlighting designers' contribution to the digital economy, this research strongly aligns with Julier's (2017) analysis including adding layers of understanding to the intensification of design thesis. The articles tackle this issue in a variety of ways, including extending analysis into the fabric of design work itself. Similarly, identifying connections between contemporary design and digital production and how digital design itself has and continues to rapidly evolve to meet ever-new and challenging changes in this dynamic domain, contributes to the literature.

Differences between agency and in-house contexts, and the characteristics of production design compared to more traditional interaction design practices, similarly broadens understanding and develops insights from Björklund & van der Marel (2019) and past accounts of practice, including Mayer-Ahuja & Wolf (2010), McKinlay & Smith (2010) and Goodman (2013).

Extending understanding of agile, and specifically its' indeterminant (it can be both negative and positive) effects on designers, builds on past research including Meier et al (2018) and Fortmann (2018) and brings this important topic to the design research community. The relationship between practice, methods and work activity crafting builds on previous research by Gray (2016), Schønheyder & Nordby (2018) and the agile and UX integration literature (e.g. Jurca, et al, 2014), extending beyond sequencing activity approaches to occupationally oriented solutions that help unify practices.

This research also extends design theory in a number of areas. Foremost, the overall findings bridge and build on the key theoretical influences on this work, including, Löwgren & Stolterman (2004), Goodman (2013) and Stickdorn, et al, (2018). The kinds of knowledge designers apply in work builds on the prevalence of intuitive types of *hunch* that Jerrard, Martin & Wright (2017) found in consulting practice. While not the focus of theoretical work, the findings also develop foundational work by Wilcock (1999) in connecting occupational balance with knowledge.

A significant contribution of this research is to build on the service design literature. Few researchers (c.f Secchi, Roth & Verma (2019) allude to the notion of generative services in the literature, although, Löwgren & Stolterman (2004) use a similar concept (adaptive system) (Ibid. pp 111).

Other contributions include extending service modality (Kronqvist & Leinonen, 2019) into the conversational domain (Knight, 2019) and adding to the service innovation (Koskela-Huotari, 2021) and e-health (Ball & Lillis, 2001) literature. The connection between agile and service design builds on research by Rontti (2016) and helps reposition both practices from up-front design (c.f Segelström, Raijmakers, & Holmlid (2009) to continuous end-to-end service realisation, thereby contributing to solving the implementation gap (c.f Shaw et al, 2018) noted in the literature.

In proposing a combination of overarching controls, remediating self-management structures and positive practitioner resistance, the interventionist recommendations of this research align with the occupational cannon (e.g. Rietzschel, Slijkhuis & Van Yperen (2014) and also to the literature on workplace resistance (c.f Knights, & McCabe, 2000). Together these contributions add to knowledge on how to make service design better at a theoretical level, indicating potential connections between design doing and improving design flow through the *three harmonising practices*, as shown below:

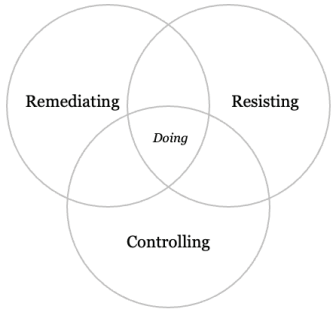



**Figure 11** Connecting doing to practice remediation elements

## Reflections of methodology

The methodology in this research evolved over the course of study and extended into non-design domains of inquiry, making the research more complex, but also potentially enriching it. Occupational research has traditionally relied on classic social science methods, centring on interviews and participant observation (Leka and Jain, 2010)

Similarly, socio-technical approaches (c.f. Trist and Bamforth, 1951) have explored work practices in the wild, to gather data and aiming to ameliorate them. Autoethnography (Ellis, Adams & Bochner, 2011) and narrative inquiry (c.f Burawoy (ibid) and narrative interviews (Lawlor, 2000) also offer ways to glean insights in physical work settings. Digital design is less amenable to this kind of observational approach as most work is performed online, although it would be possible when face-to-face activities are conducted.

While not the focus of inquiry, insights into fieldwork and analysis suggest further contributions to how to study design work and the topic of inquiry itself. In this research,

participant diary studies went some way to alleviating the lack of observational data commonly used in work studies. There are many potential improvements to the relatively ad-hoc way this fieldwork was done. Firstly, adding more structure to first-person casework research could help increase the generalisability of the data. Secondly, practitioner diary studies proved invaluable in understanding work at an individual level and this approach could be further developed by extending the range of respondent activities from those used in this study. Extending the participatory nature of the diary study analysis (participants were involved in reviewing emergent insights) has the potential to conduct more targeted occupationally attuned research in design. The overall direction of this work meandered, and a more linear approach could have been advantageous, at the same time the work pivoted from findings on occupational stress and design work, both of which are fundamental contributions of this inquiry.

## 5.1 Future research

This research has extended understanding of agile service production design. A number of practical frameworks and approaches are proposed that help embed this knowledge to make service design work better. These recommended ways of working include remediating poorly structured work using the 4d approach, applying positive, principled practitioner resistance and centralising teamwork to maximise practitioner support.

While these various unifying solutions attend to different forms of agile, and the FLOW methodology itself has evolved through practice and research, there is a great deal more research needed to validate and refine them fully.

Having insight from more case work studies and feedback on the recommended approach would enrich both understanding of design work and contribute to identifying ways to improve it further. Similarly, more implementations of the FLOW methodology[28] would enable conceptual-level solutions, including service flow metrics and continuous optimisation to be tested in the wild. Lastly, further work is needed to understand the potential value of other methods including those that lack the visibility of DT and SD but offer valuable enhancements to practice as noted in the HCD/HCI section of this dissertation.

At the theoretical level, this research has connected hitherto related but separate domains of knowledge comprising design, agile, occupation and resistance studies. More work on understanding how these theories intersect at a greater level would potentially enrich each constituent part. Lastly and at the core of this study is the goal to identify ways to make agile service design work better, to make it flow. There is much to do to realise this goal, which offers designers, citizens and organisations many benefits. A research agenda to do that would build on this research and potentially enrich insights into four related areas:

[28] A further two commercial organisations have taken up the approach since the case work concluded

| | |
|---|---|
| Digital production case studies | Studies of design work practices |
| Studies of designers' occupational experience | Occupational intervention case studies |

**Figure 12** Directions for future studies in design work

As a designer, this work has connected what I do everyday to the work my peers do week to week and has enabled me to channel my creativity into helping solve a systemic problem in the varying ways practitioners navigate work. As a researcher, this work has developed a ground-up understanding of practice that also connects with new theories in design that help understand design work better.

# 6 . Afterword

Where there is power, there is resistance
Michel Foucault

# 7 . Terms of Reference

## 7.1 Research positioning

The goal of this research was to understand in-house agile service design and seek opportunities to improve practice. The combined focus on developing insights and using these as material to build better ways of working necessitated trade-offs in balancing effort between problem definition and solution design and testing. In the early stages of study, initial lines of inquiry were identified to home in on more specific issues and develop more targeted research questions which are restated here for completeness and include:

**Q. Does digital design practice warrant research ?** How does production design differ from other practices such as interaction design? Are there differences in consulting and in-house design practices? Why might digital design be less researched than other disciplines, and was there a case for elevating this kind of practice or not?

**A.** A gap was found in the literature and sizing data suggested digital design is a significant sector of employment.

**Q. What are the strengths, weaknesses and opportunities of agile ways of working** noted in the software development literature, but less so in design? Were there systemic issues in agility that needed to be considered before tackling design specific problems? What might help design and agile work in ways so that the sum is greater than the parts?

**A.** The first article found pros and cons in agile working, in contrast to the generally negative perspective in the design literature. Generally, past solutions lack flexibility to scale to differing forms of agile.

**Q. How relevant are existing accounts of digital design to this inquiry?** How did existing accounts of practice in the design research literature relate to contemporary commercial design? Was there a delta and if so, how substantial was it? Were there useful methodological approaches used in past research to help understand digital design? What theories might help make sense of the particularities of this kind of practice?

**A.** There is a historical gap, little research has been done on digital design practice since 2013, and there is a lack of research into in-house practices specifically and methodological innovation in understanding this domain.

**Q. Do current design practices, including service design, help or hinder agile synthesis**? What are the different ways agile, and design can integrate together? What are the strengths, weaknesses and opportunities of other approaches to integration? Do these alternatives make service design work better or compromise the constituent practices? Is integration the right approach, and was there a significant underlying issue in multidisciplinarity development to solve or not?

**A.** This question persisted through the research study, influencing the approach and direction of inquiry through to the final article, focusing on the potential value of a harmonious combination of practices.

Other important considerations at the start of this research, included making decisions on the research approach itself, which methodology to use, how to balance insights from practice with empirical work, where the focus should be, theory or practice or somewhere in between.

**The research approach** was to combine in-person research within commercial design teams and in parallel carry out targeted empirical work to explore topics identified in practice. This was a practical consideration to study within work and also an important decision in focusing on grounding findings in the real world of design doing.

The research proceeded from a theoretically agnostic position, where findings preceded alignment, in order to find the best fit to theory from the ground up. These factors informed the direction of inquiry over the course of studies including a point of inflection between problem identification and solutioning, as shown in the overview below:

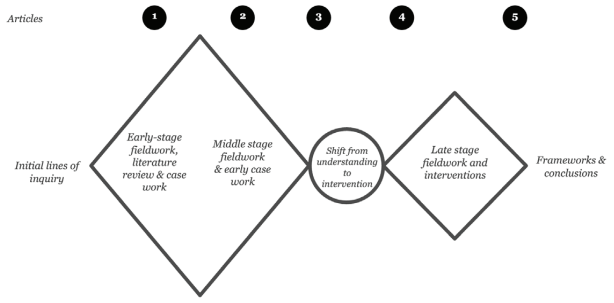



**Figure 13** Methodology overview

1 Go with the Flow
2 Unlocking Service Flow
3 Do It Fluid Approach
4 The Hexadecimal Factory
5 Resistant and Remediating Design

**The research positioning** of this work connects to the design, occupation and workplace resistance literature and key texts referenced in this dissertation as shown below:

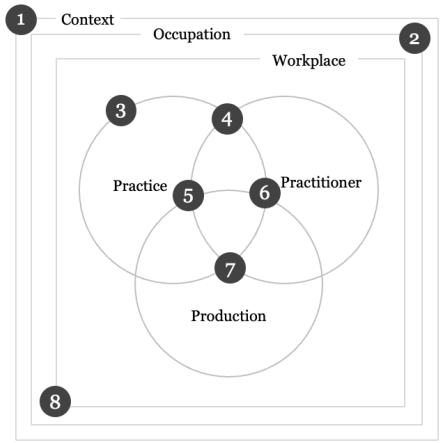



**Figure 14** Research positioning points and frames of reference

1. Julier, G. (2017). Economies of Design. Sage, London.

2. The occupational literature.

3. Mayer-Ahuja, A and Wolf, H. (2010). Beyond the Hype: Working in the German Internet Industry. In: McKinlay, A and Smith, S [Eds] *Creative Labour-Working in the Creative Industries*. British Journal of Industrial Relations, London School of Economics, Vol. 48(3), pages 210-233, September, 2010.

4. Löwgren, J & Stolterman, E. (2004). *Thoughtful interaction design: A design perspective on information technology*. MIT Press.

5. Goodman, E. S. (2013). *Delivering design: Performance and materiality in professional interaction design*. University of California, Berkeley.

6. Björklund, T & van der Marel, F. (2019). Meaningful Moments at Work: Frames Evoked by In-House and Consultancy Designers. *The Design Journal*, 22:6, 753-774, DOI: 10.1080/14606925.2019.1655179

7. Knight, J.(2024). Let it Flow: Making Generative Service Design Work

8. The grey practitioner, management and workplace literature

## 7.2 Keywords

Key terms relating to the domain and the author's use of agency and structure are defined here as these are highly contested terms. Other terminology is not defined due to their

highly contextual nature and defining them further is beyond the scope of this research. For example, design is a highly contested concept with many definitions set outside of the specific context of this research. Agile is somewhat of an exception as the preferred definition (see below) aligns with the particular forms found in the research.

### 7.2.1 Agile

Agile is a software development methodology built on two-week sprint releases. In this research, casework identified four specific forms of agile, each requiring different design strategies for successful unification as shown below:

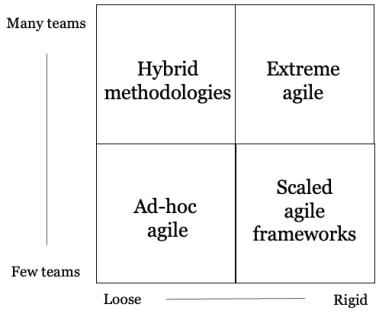



**Figure 15** Different agile forms

### 7.2.2 Professional agency

'Professional agency is practiced when professional subjects and/or communities exert influence, make choices and take stances [through their work] and in ways that affect their work and/or their professional identities', (Eteläpelto, et al, 2013). This definition helps to position the often highly contestable and philosophical topic of human agency within the specific and concrete domain of work.'

### 7.2.3 Task structure

'Is the extent to which there is a clear relationship between means to ends in the performance of a task. In a highly structured task, the procedures required to perform the task successfully are known, whereas in an unstructured task, there is uncertainty about how to proceed'. (American Psychological Association, 2018).

## 7.3 Key concepts, claims and contexts

Foundational concepts that are important to the research, but potentially deviate from the central narrative are detailed here:

### 7.3.1 Generative services

Unlike older services, these newer, highly technology-enabled services are dynamic in nature so that every agent interaction and experience is potentially unique and personalised. Generative services are enabled by digital platforms and applications that gather service flow and agent data and use this to produce individual instances of the service experience for both human and non-human agents. This technological infrastructure means that services are in a continual state of production so that new features and upgrades can be continuously added and analytics data on their performance collected. The FLOW methodology uses this architecture to enable conversational services that crucially integrate human design actors as well as automation in service realisation.

### 7.3.2 Industrialised digital design

There are similarities between theory on designers' traits and characteristics in the literature and this research, but also divergences, emanating from the production role they do nowadays. Production design differs from 'design as something distinct from the labor of manufacturing products' (Buchanan, 1985, pp 6). Similarly, designers' orientation to the future (c.f. Simon, 1996 through to Chapman, 2012) is much closer to now, and while this reduces utopian possibilities it also offers practitioners greater potential to be productive agents of change in the here and now.

Digital design work has become more industrialised and design teams' work has become more varied since the *foundation accounts of practice* (Goodman, 2013, etc) were published. The context of digital design has also altered over the past decades through shifts in employment and the growth of in-house and agency providers.

Consulting design growth was catapulted into the headlines when service design agency Fjord was acquired by Accenture (Design Week, 2013). The WPP purchase of AKQA for £350 million and Publicis Groupe take-over of LBI for £332 million (Design Week ibid.) were quick to follow suit and further evidence this shift.

Today design workflows and tooling differ significantly from those before 2020. Zeplin launched in 2014, Sketch[29] (launched in 2010) and then Figma (launched in 2016) have enabled individual designers to work closer to their developer colleagues on co-producing digital assets, code and pixel-perfect layouts. Thus the adoption of *industrialised design*, where design is code (Huk, 2017) and designing in the browser is commonplace, extends design practice into software fabrication itself[30].

Google's Material design language and Salesforce Lightning open design system, released in 2015 catalysed a further intensification of industrialised practices. These platform-based

[29] Study J. 'How brilliant it is to be using Sketch for UX and *now UI.*'

[30] Study J. 'Prototyping in code - how can we move faster'.

design team tools have enabled the production side of design to develop far beyond the bounds of traditional creative agency work. Together these moves started to blur design and development work and mechanise formerly artisanal agency-based design into platform-based frameworks (e.g. bootstrap etc) that enable organisations to design, develop, deploy and update device-agnostic interfaces in continuous agile releases.

The acquisition of Figma by Adobe in 2022 indicates the scale of design industrialisation (Financial Times, 2023):

> Adobe's $20bn deal to acquire rival Figma is set to face a lengthy antitrust investigation in the EU, in the latest move that threatens the software giant's attempt to consolidate the digital design market

Similarly, teams' use of atomic design methods (Frost, 2013), reusable components and design libraries, as well as automated layout and development integration tools have transformed ways of working. Even recently adopted practices, such as blueprinting have evolved rapidly too, remote working and improvements in digital workspace tooling have enabled concurrent and asynchronous co-design even across time zones.

In Goodman's account, designers worked 'in the absence of a working system' (Goodman, 2013, pp 2) necessitating the use of up-front design documentation (e.g. service blueprints, prototypes and wireframes) to represent screens and mimic working software. Having separate design artefacts from working software had a number of generally negative repercussions, that are less common now with the evolution of modern Front-end Development (*FED*) practices.

The documentation approach made it harder to get accurate usability data and gain foresight into how the designs translated into working software. The situation made it hard for designers too, as their deliverables were to some extent a matter of faith in terms of how they might turn out live, weeks and sometimes months after they had *thrown them over the fence*[31].

Agile and its focus on removing wasteful documentation, helped close this gap by necessitating design in production itself, reducing the need for non-production deliverables so that the generative service is the (manifestation of the) working software and ui design specification itself (Gothelf, 2013).

The end of the era of industrialisation may be dawning. Many layoffs in the digital economy and a contraction in the design job market are testament to the size of the sector and its dynamism in constantly reorganising labour. A common thread in the practitioner literature on these changes is the notion of 'over-hiring' designers in the boom and that a large proportion of relatively under-experienced practitioners has bloated the design population in turn leading to some reassessments including Lima (2023).

This popular, practitioner publication diverges from the traditional demarcation of design disciplines and also notes the widening role of design in organisations, including the difficulty in solving ethical issues. A practical response to this problem emerged in the later stages of research through developing a design thinking methods type tool (see below) to help teams crowdsource exploration and resolution of these pithy kinds of issues:

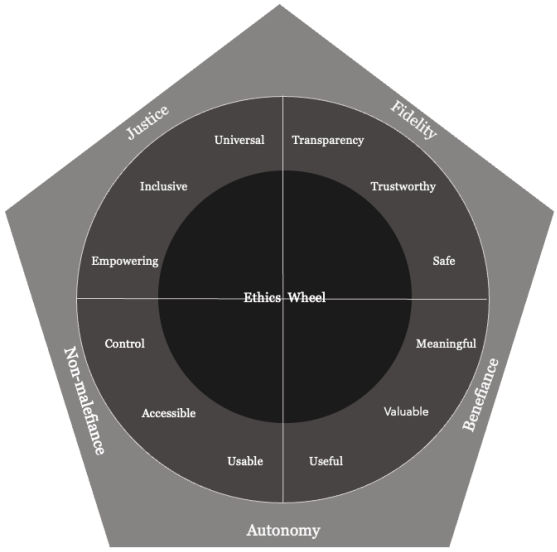



**Figure 16** Design Ethics Wheel

### 7.3.3 Design crafting

The kind of performative work that designers do delineates their profession (Lawrence, 2004) and their occupational jurisdiction (Bechky, 2003) as professionals. What practitioners do is integral to their being and knowing and their sense of belonging and becoming (Billett, 2011) so that occupation is both an end and a means (Gray, 1998) that manifests professional identity (c.f Kunrath, Cash & Kleinsmann, 2020 and Becker & Carper, 1956).

Crafting is a key work activity for designers and involves defining and conducting all of the activities, methods and deliverables practitioners consider essential to deliver the work, continuously adapting work plans to accommodate changes in requirements and sprint goals within the work itself. This means designers shape the work through the work using knowledge, judgement and effort to deliver what is required by development teams, within mission lifecycles and maintaining design integrity and their own well-being. The literature on job crafting suggests this also benefits individuals and organisations even at the level of task design (Mäkikangas & Schaufeli, 2021).

Crafting design, elaborating on some *design the design* (Seravalli, 2012) characteristics is not just an upfront activity that happens before starting work, but rather is similar to the *scoping moves* Goodman notes (2013, pp 126) where:

> craft is a metaphor' [in] the constant redesign of the work itself…[which means practitioners] final composition depends on moment-by-moment decisions as their creators react to the state of the piece and their goals for it (2012, pp 144).

Most often crafting the particular set of formats, methods, activities and outputs involved in design work is done in consultation with managers and peers. While standard methods, methodologies and processes help do this, there is rarely a requirement solved without the need to adapt, combine and deviate from the norm or create an entirely bespoke task. At the same time crafting work without recourse to standardised activities is possible, but most likely generally done by highly experienced practitioners, and a situation internal and external clients would likely baulk at – knowing outputs before work starts is important in ensuring good stakeholder relations. Some structuring it would seem helps but over structuring inhibits individual professional agency (Rietzschel, Slijkhuis & van Yperen, 2014).

Findings in this research suggest methods play more of a supporting than primary role in practice. This standpoint has some affinity with Woolrych, et al (2011), albeit with greater emphasis on practitioner professional agency, where crafty structuring of work helps remediate the often poorly defined work requests seen in agile working.

That is not to say methods are not used or that they are not useful, although only 5.98% of work activities aligned to methods-based working in the diary study data (unpublished). This also sheds light on the different kinds of jobs in-house designers do nowadays, indicating a preponderance of production tasks, compared to more traditional, waterfall-type activities as shown below (Unpublished output from the diary study research):

**Table 2** Design work type mapping

| Task type | Ration |
|---|---|
| Production tasks | 48% |
| Crafting work | 29% |
| Upfront work | 14% |
| Moderating roles | 24% |
| Performative work | 12% |
| Research activities | 14% |
| Service design | 7% |
| Total | 100% |

## 7.4 Methodological developments

### 7.4.1 Unified generative service production approach

The articles tackle different aspects of agile service production design including defining problems and developing and validating solutions. Together the remediating practices combine to give a comprehensive approach to making service design work better. These practices also map to occupational and organisational constructs, suggesting a good fit between the research, theoretical alignment and solutioning as shown below (Unpublished output from the casework research).

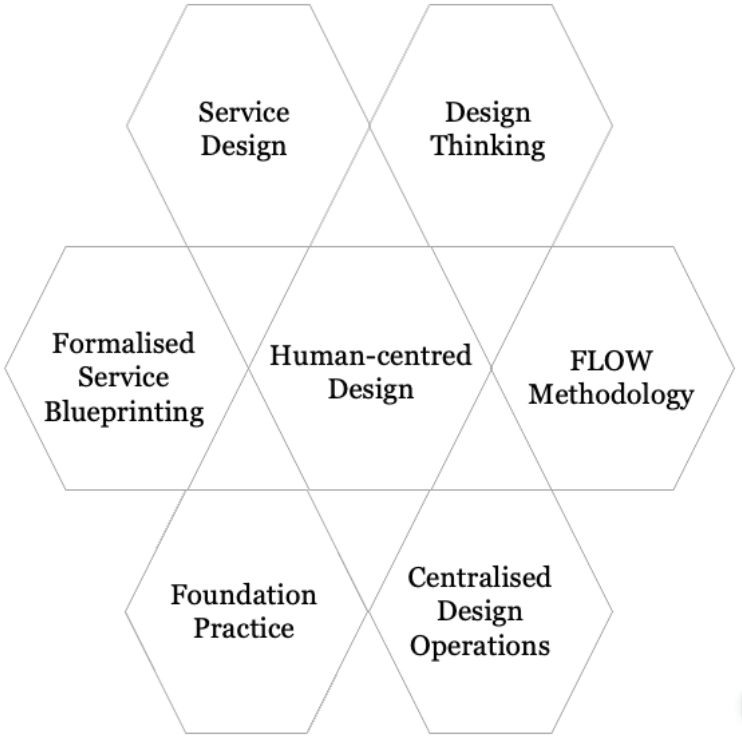



**Figure 17** Unified service production design matrix

### 7.4.2 Agile service design enhancements

Ways to evolve current service design practices, so they integrate better in agile production were identified in this research. Service blueprints are a valuable and differentiating tool (no other discipline, excepting business analysts to some degree, do this kind of work) for designers. Shifting them from static visualisations into living design artefacts, that communicate as-is and to-be service experiences extends their potential.

However, a lack of standardisation (e.g. notations etc) and integration with production practices (e.g. backlog tasks) reduces the value of service blueprints, as scaling ad-hoc practices and integrating them into production is difficult and fails to address the design-

to-development gap. This situation also lessens the chance of reuse and distribution of common service architectures.

Structuring the blueprint field (see below) using formal blueprinting approaches developed in the casework, increases the likelihood of reuse, research and design efficiency, integration into development workflows and sharing common service solutions internally and externally; thus reducing cost, effort and lead times.

Formatting blueprint items as single-phrase texts recorded as storycards also increases information consistency, ease of management and potential diffusion across teams using blueprints as a single source of truth.

The proposed formalised service blueprinting (Unpublished output from the casework research) approach enhances conventional practices, starting from the service field, which is divided along the x and y-axis. A vertical line of service production delineates backlog cards from those that make up the generative service as in the figure shown below:

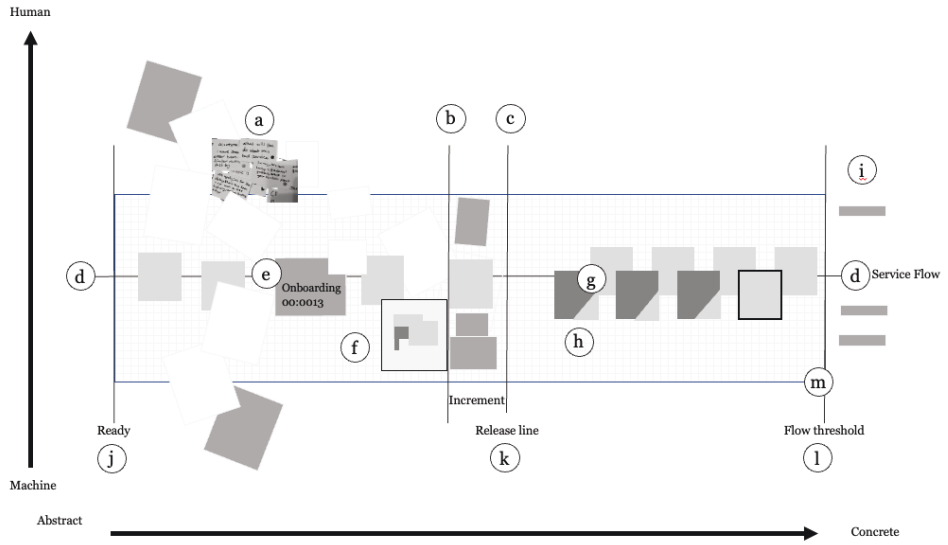



**Figure 18** Formalist service blueprint example

Content and Context cards (a) document touchpoints and supporting information and insights. Cards can be annotated and coded so that they evolve (AKA *Insight and Solution Accumulation*) from low (handwritten) to high-fidelity (digitalised) versions. For example, cards representing personae might start at high-level single-word descriptions that grow incrementally with detail as research and design progress, using the cards themselves in sorting and elaboration activities with users and stakeholders. This incremental layering of research data and solutioning is more closely aligned to agility than extensive, upfront discovery type approaches noted in the literature.

Cards are moved rightwards on the service field from *as-is* to *to-be* stages during team reviews and design sessions that can include users and stakeholders. The service flow line (d) contains atomic-level utterances in the case of conversational design and descriptive

content for conventional services. Elements can be layered, nested and moved across the service realisation threshold (b) when they are defined as ready for production.

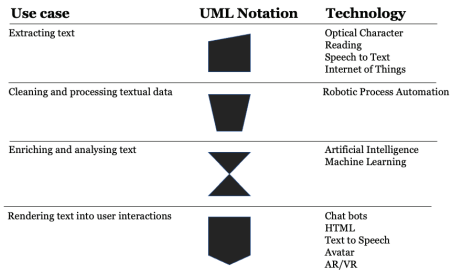
Missions begin from the ready line (j). The release line separates design from production cards so that everything to the lefthand side of the field is still in a pre-production state. When finalised, related cards are marked and collated as a *done stack* (f). These sets of cards include preparatory content and a final signed-off version to enable requirements traceability. These agreed packages of work are then assigned to a service increment via sprint cards (h) as they are moved across the release line (k) in accordance with agile ways of working.

This formalisation delineates *work in progress* from the live generative service where service flow data can be harvested (i) and used to improve the service experience. Agile style ticketing cards (h) can be referenced in sprint ceremonies as they are completed via each increment that delivers a working, fully functional vertical slice of the service.

Service realisation sprints continue to build toward the three *service realisation stages* that were defined in the healthcare case. Conversational services, deliver the service dialogues (g) as code, agent scripts and non-dialogue elements such as signage and application screens referenced in the blueprint. However, these can also be used in conventional services where text forms the basis for specifying visual elements and non-textual interactions.

The Service Flow Line (d) sections off the end-to-end service dialogue, whether the service is conversational or conventional, providing a service narrative that can be adapted, scrutinised and changed before any interaction design assets are originated. This novel addition to ad-hoc blueprinting practices enables stakeholders to quickly review the *happy path* through the service and also helps reduce the *granularity problem*[32] as the modular approach means multiple card sets can be nested.

Layering blueprints with relevant ancillary elements, including automations and technological enablers within blueprints further increases the potential of service design and its applicability in production type work. Chapters, in a similar way to nesting, enable blueprint modularisation (e) that can be extended to include UML (Eriksson, et al, 2003) type annotations (see example below, unpublished output from the healthcare case research) that help bridge design and development solutioning and introduce more formal ways to define and measure services, as shown below:




[32] This refers to service blueprints becoming too large to manage as they present all items in two dimensions. Nesting allows related cards to be collected together, thereby reducing density but enabling detail to be layered onto card sets.

**Figure 19** Service formalism example with UML style notations

### 7.4.3 FLOW methodology

The FLOW methodology helped define a generative conversational service healthcare case. Conversational services are beneficial in providing cost efficiency, ease of development, optimisation and accessibility, compared to traditional services. Specific health-related benefits include increased disclosure in computer-mediated communication (Joinson, 2007).

The resulting methodology is a text-based approach that extends earlier work by Pearl (2016), in light of technological innovations including AI, ML and ChatGPT (Biswas, 2023) and specifically enabling automation to be considered in early service definition work. At the same time, the overarching human-centred focus of the methodology assures an equitable enablement of human and non-human service agents and ethical outcomes.

Service discovery activities differ drastically from traditional design research. Closer to human-in-the-loop automation based-analytical approaches, FLOW uses directly digitalised, task-related, user documents and artefacts. Scanning process and procedures documents, user manuals, and data from actual service cases including, for example, call centre interactions provides a rich source of requirements and service verbatims (also taken from agent interactions and research sessions) that can readily be integrated into service production and triangulated with other kinds of data, as shown in the schematic below (Unpublished output from the healthcare case research):

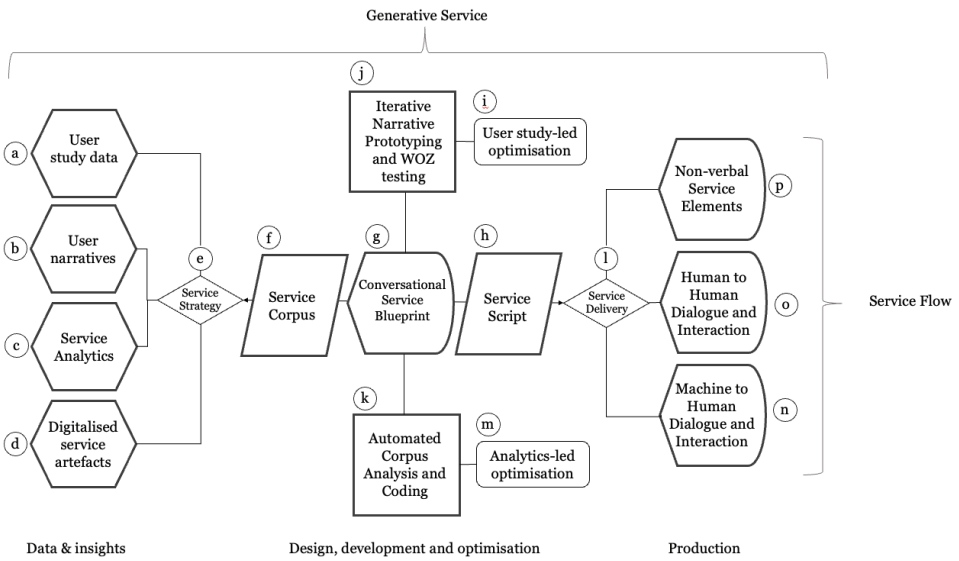



**Figure 20** FLOW Design methodology schematic for conversational services

Digitalised service artefacts gathered from contextual data and including scanned documents (*d*) form an element of the requirements side of the Flow methodology. Complimentary service analytics (c) gleaned from the 'as is' service, whether digital e.g. service agent transcripts or contextual feedback enriches the data set. Likewise, user stories

(b), including self-authored, individual and group narratives, self-reports and workshop and study verbatims are stored for analysis.

User study data (a), which can include gathering data taken directly from participants is also kept in the requirements area. User workshops help elicit, ideate, define and fine-tune content and the resulting transcripts provide both contextually rich research insights and atomic-level textual content that can feed into corpus development. These various data items are converted into single-phrase storycards that can be used in digital and physical service blueprinting.

An overarching vision and direction help inform and align all cards (e) that are plotted on a blueprint (g). This integrates traditional service blueprint front and backstage activities to the core service dialogue (k) that changes status as cards move into production. The full generative service is documented via a centralised repository that records the whole of the service dialogue (f). This includes the service epics, narrative and utterances and covers all aspects of the dialogue including loops, repairs and lexicons, which are common elements within conversational design.

The corpus undergoes traditional design research based on iterative design and testing (j) and automated enrichment improvements (k). Analytics-led optimisation (m) utilises live service-generated data from service interactions to identify improvements. This is complemented through user study-led optimisation (i) utilising design research to refine and develop the service directly from human feedback. These three data sources help triangulate insights and crucially bridge the as-is and to-be states through continuous harvesting of data from the generative service itself.

The Generative service is delivered through managed release sprints. These are organised by an operational core (l) that aligns strategy to production. Machine-to-human dialogue and interactions (n) including non-human agents' interactions such as chatbot scripts and grammars are stored for production and optimisation work. Human-to-human dialogue (n) and interactions are managed via human service agents' repertoires. Lastly, scaffolding around the service dialogue, such as interactive forms is covered in a separate managed service area (p).

# 8 . Postscript

Työ tekijäänsä neuvoo
Finnish Proverb

# 9 . FLOW - VERSION

### 9.1.1 Overview

The FLOW VERSION is a lean variant of the conversational service design methodology detailed in the Terms of Reference. This cut-down version can be readily used by teams of any size and in any sector to quickly innovate services of middling to strategic sizes. The crucial difference with conventional service design practices is shifting the visual paradigm to narrative. Instead of wireframes, flows and visual representations, FLOW VERSION uses only text (via Scripts, Narrations and Storycards) at all stages of design even if there is a final graphical output that translates copy into visuals if the service includes traditional digital touchpoints.

Shifting to story-based design has a number of advantages over purely visual representation, in enabling the widest stakeholder and user participation, reducing up-front visual design lead-times and most importantly building on rapid, human-centred Wizard of Oz studies that help factor in automation at an early stage of development.

Extending WOZ to group narrative creation, refinement and enactment means that new services can be quickly designed and prototyped in DT-type workshops where participants, including stakeholders and potentially service users, can produce a *version* of the service using themselves as human and non-human agents. Integrating service flow data, requirements and insights in these kinds of sessions also reduces discovery time and maximises stakeholder alignment on service user needs.

Storycards play a critical role in the workshops and document the evolving understanding of the problem/opportunity and solutions to it. This means that they are not just static single phrases of information, but rather are the ingredients from which service blueprints are made up from. As annotatable design objects, they can accrue information and extend over time from initial high-level versions to production-ready stories. For example, user profiles often start just with a name but evolve as more detail is added and insights are discovered until they reach a saturation point where the cards are finalised. As deliverables, finalised storycards readily translate into agile user stories, design components and rationale using the taxonomy detailed in the Do It Fluid article (Knight, et al, 2019) and shown below for reference:

**Table 3** Storycard Taxonomy

| Service analysis story-card set | | Conversational service story-card set | |
|---|---|---|---|
| Storycard (5As) | Definition | Storycard | Definition |
| Agents | Human and non-human agents within a given service | Narrative | Service encounter and navigation, complete flows with key errors, hand-offs, interruptions etc |
| Artefacts | Physical objects embedded in the service | Dialogue | Detailed conversation stories |
| Attitudes | Insights into the service including service flow itself | Loop | Detailed conversation interactions |
| Activities and Actions | Repertoires of behaviour from overarching to atomic operations done by agents | Repair | Finalised conversation exceptions |
| Axioms | Underlying rules and values that guide activities and actions done by agents | Utterance | Atomic-level conversation content |

### 9.1.2 Scenario

The following scenario is used to demonstrate how FLOW VERSION works in practice. SISU Healthcare is a Finnish healthcare service provider that operates through its centres, digital services and in the home. The SISU Service is maintained through the engineering team that continuously releases software improvements in tandem with the operations team who deliver change to and via human service agents. Analytics data including throughput, clinical outcomes and patient satisfaction scores are aggregated within an internally developed Service Flow dashboard which is used to identify optimisation opportunities and areas for potential automation. This data is also used in reporting to regulators and investors and is harvested in real-time.

The thirty-strong in-house design team at SISU sits within the engineering practice and includes a small leadership team of five practitioners who cover the teams' operations, research, design, people and strategy. The team reporting to the leadership comprise five each of the following practises, service design, interaction design, design research, content and operations. Established for over ten years they have developed a long-term strategy for the team, built a comprehensive backlog of design-led projects and maintain a living service blueprint.

They have also packaged a set of methods-based accelerators together including a four-week discovery offering as well as ones covering Usability Testing, Design Thinking, Service Design and Design System Workflows within a Foundation Practice that is used in onboarding and training. The leadership team qualify incoming work and projects are managed centrally with varying levels of structure, depending on their size and importance.

For medium-sized missions they apply the FLOW VERSION methodology as this enables them to quickly and collaboratively create or refine an existing service using narratives that can be used in generating human service agent scripts, digital touchpoint design and service automations. Being able to enact a pre-production version of the service in user and

stakeholder workshops reduces risk, ensures patient acceptance and evidences clinical outcomes that help build internal alignment and regulatory compliance. As middling-size projects are common in SISU, the team's operational capabilities, access to reusable assets and service flow data and insights underpins their core operating model (shown below) used to communicate the design teams work internally.

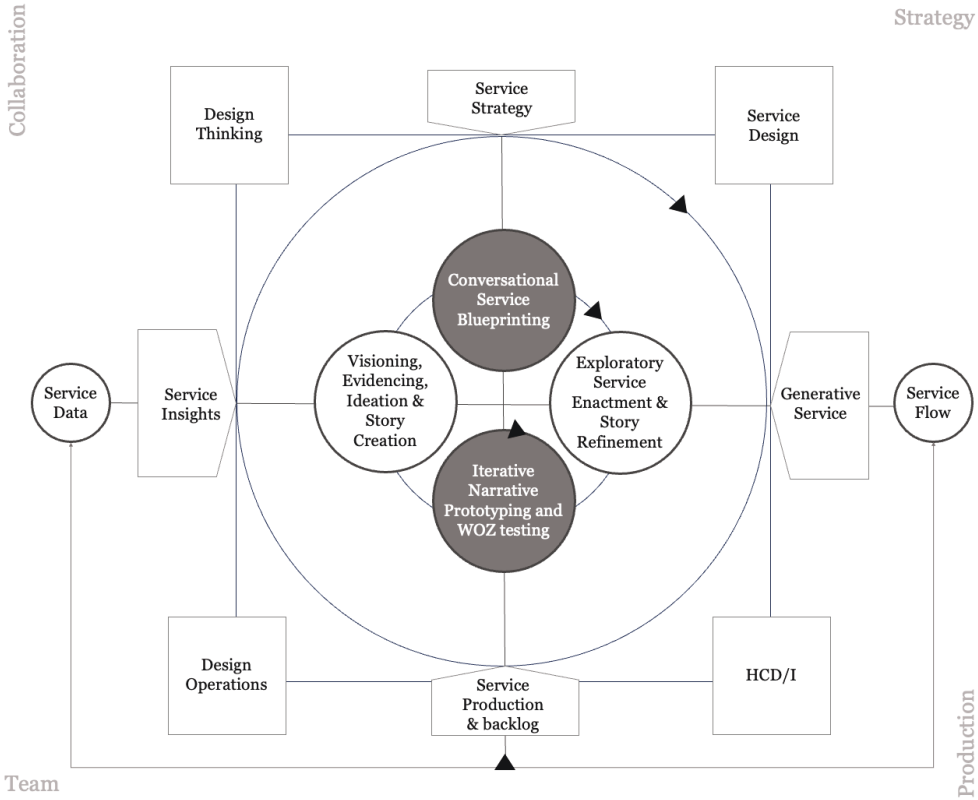



**Figure 21** FLOW VERSION Methodology & indicative operating model

### 9.1.3 Project overview

The team are asked to support a new ADHD testing service within a four-week accelerator project. The work is qualified by the leadership and a content, interaction and service designer are tasked with the project supported by a researcher. Using the standardised FLOW VERSION templates they organise two workshops and two user research sessions comprising:

- Visioning workshop
- Story Workshop
- Service Blueprint Co-design
- Service Script Testing

The visioning workshop is a three-hour session with representatives of the various in-house teams involved in the project. Design thinking methods are used to elicit, capture and prioritise activity outcomes. The session begins with reviewing existing research and requirements captured on a digital whiteboard as cards. The board has been populated with known information before the session and each existing card is discussed and annotated as well as new items being added. The same approach is used to set the project vision and define a high-level (Epic) service script based on existing knowledge, that is ideated to explore alternative ways the service could work at the three *service realisation stages*.

The outputs from this first workshop are fed into user research activities that validate, extend and further progress domain understanding with representative users. The cards are refined and populate the as-is version of the service blueprint using a formalised taxonomy. The working blueprint is reviewed and refined with the stakeholder group every couple of days to highlight the overall direction of the design solution.

As the service script stabilises, the storycards are refined by the content designer using SISU's tone of voice guidelines. Further user research is done directly on the blueprint so that participants respond verbally to the service script cards enabling further refinement and detailed design where loops, branches and repairs occur. The work then shifts to testing and refinement using Wizard of Oz studies to refine the script and internal enactments to share an understanding of the service. Blueprint cards are then finalised and directly form the backlog for the engineering team to work from, having been involved in the previous activities reducing the need to document requirements separately. Once the service goes live, service flow data is collected and used to further refine the new ADHD service.

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The findings from this research identify new kinds of design work, that are marginally covered or even absent in the literature. Today in-house practitioners perform traditional up-front strategic level activities, in similar ways to their predecessors, as well as working closely with developers in production workflows, to build out and maintain digital products and services. This extends creative practitioners' responsibilities and adds complexity and range to what they do, particularly in in-house practices, where service design work is ceaseless. In this context, design is always there, never done and designers are continuously on call to do varyingly creative tasks, from small tweaks, and middling missions through to strategic generative service innovation.

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