

# DESIGN SPRINT METHODOLOGIES TRANSFORMED IN A DIGITAL ENVIRONMENT

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## ABSTRACT

How can you deliver innovative teaching to over 150 students to propel their learning, connect them with leading industry experts, solve real world problems, and offer students the chance to learn from their peers across year groups? This paper presents the Design Sprint project; an intense five-day event delivered in 2020/21. This project engaged product design students from Nottingham Trent University (NTU), a team of over ten academics, clients from an industrial design team (Futura Nova), a large healthcare institution (UCL Partners), in addition to partnering with Anglia Ruskin University, to engage with focus groups within healthcare. This paper outlines the preparation and facilitation of the design sprint, identifying why we chose this methodology despite the challenges of remote/online working. The preparation/pre-sprint sessions and the key components of the sprint are discussed, highlighting how we adapted the traditional design sprint model into a hybrid methodology. The activity plan shares the key activities undertaken with examples of the Miro workbooks. Our approach was to build a programme that we could utilise going forward in online or in-person settings, to further develop the product design curriculum at NTU. Our main aim in delivering this methodology was for different year groups to work together in a live collaborative project whilst sharing/learning knowledge from a professional industrial network when utilising a methodology which could be applied in their future professional practice.

*Keywords: Blended learning, collaborative/cooperative learning, design sprint, product design, transformation, pandemic, education, digital inclusion, hybrid learning*

## 1 INTRODUCTION

A design sprint is a flexible product design framework that is used to maximise the chances of producing an outcome that people will want; the design sprint process is conducted by a team whereby a product or service is designed [1]. Usually, a design sprint utilises and wraps elements from the design process whereby scientific methods are combined with design activities in combination with philosophical viewpoints and perspectives. Design sprints are often used to solve big problems and test new ideas. Jake Knapp presents a structure/framework and a variety of focussed activities to allow a successful design sprint to be completed within just five days [2]. Integrating design sprints into the classroom or a design studio however is a significant challenge. This is complicated further when integrating this into higher education setting, especially within product design education where cohort sizes can vary from 50–150 students. Integrating design sprints into the classroom as a way of exploring new active learning tools for project-based learning approach has been utilised by academics in various sectors ranging from human computing, UX/UI design, engineering, industrial design, amongst others [3-5]. However, many researchers note that it is important that design sprint activities are run in a timely manner in order to rapidly focus product innovation to drive more valuable outcomes for the user [5].

Design sprints have considerable benefits towards teaching and disciplining students to work in ways that they will experience in industry. This approach has proven to compliment action design research, especially within the design of healthcare products [6]. This paper presents the design/delivery of an intense design sprint for 150 BSc Product Design students at NTU. This design sprint, originally planned for in-person delivery within a large design studio, was conducted within the confines of an online environment due to the UK COVID-19 pandemic national lockdown. The design sprint project presented an opportunity to engage students in an interactive way that they would not otherwise have experienced due to the limitations of working remotely. Initially planned as a 2<sup>nd</sup> year project, this soon

became an opportunity to unite 1<sup>st</sup> and 2<sup>nd</sup> year groups, to encompass a more holistic experience where both year groups would meet for the first time online and share a collaborative learning experience.

## **2 DEVELOPING A HYBRID DESIGN SPRINT MODEL**

The design sprint methodology is often used in business communities to rapidly test ideas to see if they have potential for further investment of time thus identifying the right opportunities to progress. Companies adopt this methodology to seek quick feedback on ideas so that they can save time and money. Adopting this methodology compresses potentially months of work into just five days. Originated out of Google, design sprints have become a benchmark for companies to adopt and expediate their development process. Working with experts, an intense five-day activity starts with the problem statement and progresses through a plan of Mapping, Ideation, Prototyping and Testing to achieve a desired outcome. The length of the design sprint allowed us to plan a five consecutive day event that reached an outcome that the 2<sup>nd</sup> year cohort would subsequently further refine/develop to conclude a second stage summative assessment. In addition, the design sprint methodology is a business tool that we wanted to utilize considering the topic of focus i.e., the healthcare sector. The project brief statement below was created in collaboration with one of our professional partners Future Nova:

*“How might we find a better way for healthcare professionals to capture and share information in a clinical environment”*

Developing the design sprint alongside Future Nova allowed skills that resided outside of the academic team to be leveraged, in this case their network at Anglia Ruskin University and the Academic Health Science Network. The development of the online/hybrid design sprint was significantly more effective when engaging a wider group of collaborators. When setting up our hybrid design sprint model, there were three distinct differences compared to a traditional sprint. Firstly, the challenge environment would typically exist within a business organisation; ours existed outside of the business organization and in an academic framework. Secondly, the challenge would be set and solved within the framework of a business, relying on the internal experts to solve the issues; ours was set by an external professional partner and we had to draw on the diverse external expertise to inform the design sprint process. Third, a typical delivery of a methodology would be face to face; our delivery was fully online. The biggest challenge we faced was how could we translate an intense in person experience and deliver this as an immersive online experience across two-year groups with differing abilities and expectations. The digital environment needed to become a portal for all activities for our cohorts.

Our schedule of delivery utilised MS Teams supported by the use of Miro. However, unlike lectures, tutorials etc., that may last up to an hour, the sprint programme was an intense five-day event whereby each day provided up to six hours of contact time. The challenge we faced was how could we maintain the momentum and interest of the students throughout the full five days to ensure progress through the projects and avoid fatigue. We faced a number of challenges working online due to the intense nature of this methodology. The biggest challenge of note was empowering students to interact and find their own social groups. Engagement in sessions was challenging with not all students turning their cameras on or contributing to group activities. The use of technology itself was a challenge including lack of internet, poor/intermittent connections for both for staff and students. Setting up MS Teams calls with 150+ participants across the globe was challenging. As the event required full time engagement over 5 consecutive days, avoiding mental fatigue was also a concern. We also needed to ensure that the methodology was inclusive and not isolating with a number of students having various statements of access ranging from learning difficulties to registered disabilities.

After conducting a gap analysis of the current sprint, we found that elements of a traditional design sprint were either not required or had to be adapted for online delivery. Furthermore, due to the student's familiarity working through taught design processes, we adapted the design sprint methodology to align to the knowledge base of our students and removed steps which were repetitive to allow quicker progress. This adaption compensated for the fact we were working online rather than face to face. Working online also meant our transition to activities would be slower due to moving students and staff through Miro board links and in/out of MS Teams channels. The lack of physical movement which would be otherwise presented in a traditional sprint model was compensated by immediate access to prerequisite resources. The success of this was having a core localized sprint team who had definitive roles to support the event and were a key part of the planning ahead of the events. The roles followed a

“RACI” profiling where the core team took roles to be either be Responsible (R), Accountable (A), Consulted (C) and Informed (I). Roles may have spanned the RACI with roles varying from macro planners, micro planners, developers, and facilitators.

## **2.1 Professional engagement**

A key measure of success was based on drawing on professional expertise to fill gaps of knowledge and understanding of the problem area. The challenge area was focused on acute care in a healthcare setting. We relied on our partnership with Future Nova to provide support as experts in the field and to further help secure the support of two other key partners for the project; Anglia Ruskin University supported the formation of the user focus group. In addition, UCL was introduced as they could advise students on what they would be looking for as buyers within the NHS. All parties were part of the expert panel on day five whereby they represented the client, the clinical users, and the buyer. This level of input needed a high level of coordination and flexibility from each of the parties to be aligned to the master plan. Being online provided an enhanced opportunity for engagement which may otherwise not be afforded with a traditional schedule. Our engagement with our partners was supported through collaboration with Future Nova; their historical relationships proved invaluable for us to be able to engage with the UCL and Anglia Ruskin University.

## **2.2 Preparing and planning the Design Sprint**

Planning the roadmap for the design sprint started months in advance to engage the core industry partners and further to embed their knowledge/expertise. The roadmap of engagement for the students and staff started ahead of the core design sprint with a small number of icebreaker/team bonding events, followed by the pre-sprint day. The pre-sprint session was delivered a month in advance where a number of outcomes were tested. Firstly, we needed to test the engagement of the students and how they connected within their cohort and across year groups. Secondly, the timing/sequencing of the activities, including the transitions between Miro and MS Teams. Finally, student fatigue rates needed to be established by testing the activities and pace to retain engagement throughout the day.

Whilst the pre-sprint activity was all delivered in one day, the sprint was to be delivered over five days. The content that we created to support the five-day sprint was released in a methodical/controlled way to prevent students getting ahead of themselves. Each day was revealed at the end of the subsequent session enabling the students to gain awareness of what was planned next. The master plan for the sprint included the planning of day-to-day activities in the sprint and pre sprint sessions and further planning of the student groups. As we were integrating year groups that had otherwise never met or worked together before, we had to curate balanced groups considering ability/skill set, ethnicity, location, interest, friendship groups etc. We allowed each of the 1<sup>st</sup> and 2<sup>nd</sup> years to choose their peer groups within their respective year groups which we then matched together appropriately. The challenge for 1<sup>st</sup> years was that their social contact had been minimized. As such, 1<sup>st</sup> year selection was also supported through tutor discretion, where we could see peer support groups had formed.

As in all cohorts, there were students of low engagement which we spread across the groups to provide the best opportunity to work with their peers but also minimise groups with negative outputs. We curated teams of 10 students which included four to five second years and four to five first years. Balancing of groups with additional students was conducted where we felt that attendance of some may be an issue due to historical performance or the inclusion of weaker students. These groups would stay together throughout the project. The groups were assigned their own pre-built Miro board and MS Teams room for the whole event which they owned, and this provided a collaborative and engaging working space.

## **3 THE PRE-SPRINT**

To engage the students effectively prior to the five-day design sprint, pre-sprint lead in activities were delivered online to engage the students across the cohorts. This also allowed the academic team to understand the student’s capability/resilience to stay within a programme for an extended length of time. Furthermore, we used these events to ensure that any specialist knowledge or student contacts/network could be harnessed prior to the five-day sprint. The two main tasks of the pre sprint day were to identify the roles within each of the student groups and map out student knowledge in the challenge area whilst identifying what they didn’t know. The pre sprint activities allowed the groups to practice working as an active group for the first time, this gave them time to figure out how they would stay connected using social media channels offline. Among the key activities developed was the profiling of each group

member. A profiling matrix helped define roles and responsibilities of each team member identifying current levels of core skills and creativity. This profiling helped each group understand how each other's approaches may be biased and how to address this ahead of the remaining activities (Figure 1). The shaping of the teams involved a number of activities to be completed within a 30-minute timescale. These timed activities related to the brief were core to the pace through the pre sprint and sprint. Short bursts of energizing activities were also balanced with regular breaks to rest and refresh. This pattern was typical of a traditional sprint and proved even more important to relieve fatigue experienced in intense online sessions. By the end of the day each group presented their chosen project direction.

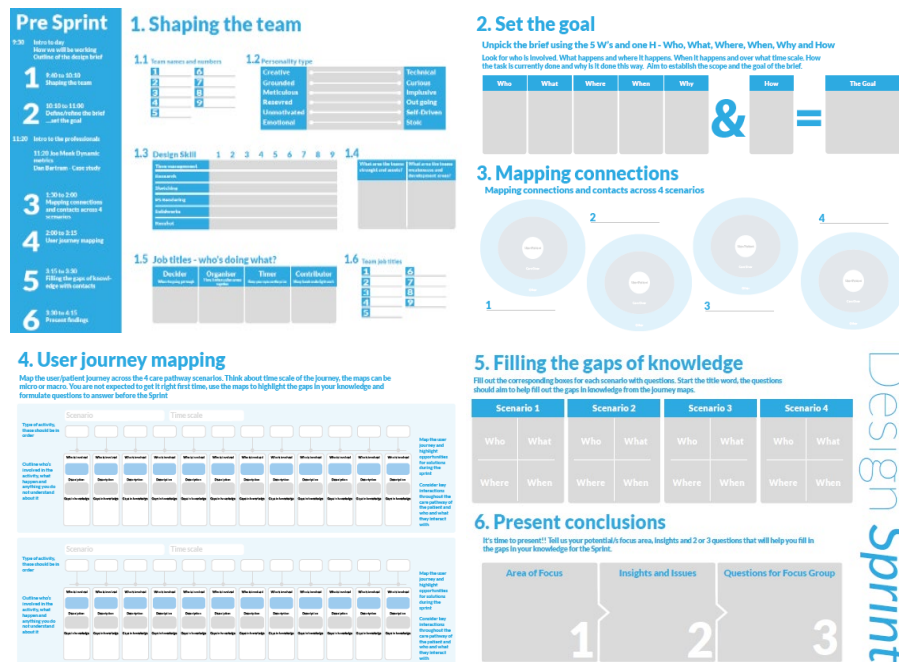


Figure 1. Pre-Sprint Activities & Workspace

#### 4 THE 5 DAY DESIGN SPRINT

The five-day sprint delivery aligned to the structure of the pre-sprint sessions allowing progress throughout each day. The supervision of the tasks allowed the gradual unlocking of the Miro boards. The launch events visibility to activities in a controlled manner ensured the students did not feel overwhelmed, but also ensured groups didn't jump ahead/skip parts of the process. Each activity was facilitated by the core academic team and supported by the collaborators at appropriate times. Each activity had set expectations and defined time limit with expected outputs. The exercises were supported through examples described by the facilitator and supported further with real life case studies to ensure realism/connection. MS Teams channels were set up for each of the groups to meet outside of the main MS Teams channel. Whilst this ensured students worked amongst their group, the academic team could join any group at any point to encourage collaboration/facilitate discussion. The ability of the tutors to move around the activities/groups on MS Teams and view student work through the Miro links provided transparency to enable intervention if groups were not progressing. The Miro boards were laid out with structured day to day activities (Figure 2). This approach formed the backbone of the sprint allowing engagement within each team; the Miro boards also formed part of the group's formative assessment alongside their pitch to the clients on day five. Whilst work was being developed across the five days, progress could be tracked remotely and further monitored across group activities.

The core tutor team monitored the workflow in each session and adjusted the subsequent sessions, accordingly, thus building on the knowledge of how well students had engaged and rate of completion. Without doubt, working online provided the benefit of constantly connecting with professional teams across the breadth of the UK. These touchpoints with individuals may not have been as easily available if we had not adopted the platform of remote communication through MS Teams. The focus group that helped contribute to the student's primary research was also organized remotely and had to be timed to the availability of the key healthcare professionals across multiple sectors and healthcare providers. Engagement of the students was challenging at times; some students did not switch their cameras on at all and some never responded in the live meetings when prompted. Engagement could be monitored

through the work produced in the virtual space which was name/time stamped upon creation. In an attempt to reengage students we managed this with one-to one follow ups.

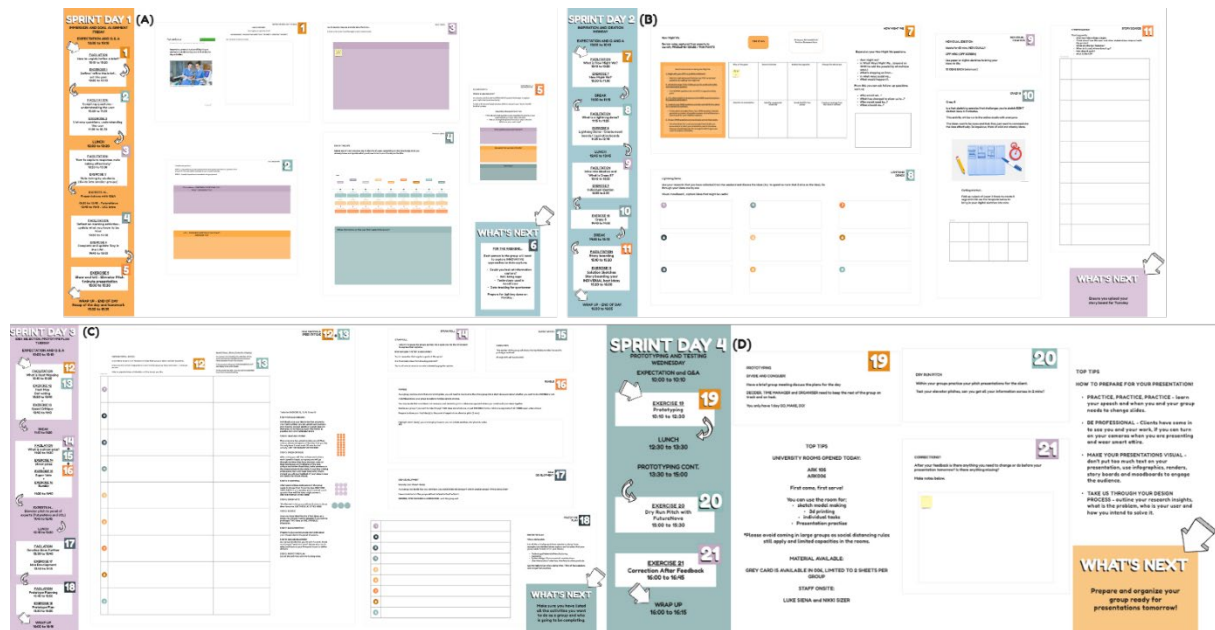


Figure 2. Design Sprint Miro Boards:  
a) Day 1: Map, b) Day 2: Sketch, c) Day 3: Decide, d) Day 4: Prototype

To further reassure the remaining group members, peer assessment was used to confirm the contribution or not of students. Students that had disengaged were encouraged to return to the group as they needed to show evidence of the project as it contributed to their assessments. For first years this was part of their summative portfolio and for second years the project outcomes would develop into a CAD summative assessment. In addition to the direct curriculum learning for both year groups, there was an expectation from the second years to demonstrate skills and knowledge gained through collaborative working i.e., taking on leadership roles which could support their own personal development leading to their placement year. The experience of delivering this methodology online will allow us to introduce tools and methods into the future delivery of hybrid sprints which may take place in a face-to-face environment in future academic years. Tools such as Miro/MS Teams continue to provide access to invaluable expertise and potentially open up opportunities to enrich the experience of face-to-face teaching and learning whilst also providing a level of flexibility to engage with external professionals.

#### 4.1 Student outcomes

The design sprint connected two-year groups in a vertical learning experience. The aim was to develop their professional skills whilst working in a team of mixed abilities thus creating opportunities to find their own space within a team and identify themselves. The tasks were diverse to allow the strengths of everyone to be used and provide a sense of self-worth and accomplishment within their group. This forced most students to engage and see where they could contribute to the tasks within their assigned role to ensure success for the team. The group dynamic would help propel the teams through the stages and this was even more critical due to the remote nature of the activity. Whilst building the challenge area and the activities of the sprint, we worked alongside the requirements of the curriculum both for first and second years. We also were aware that whilst building the collective plan we were working with differing outcomes. As this was designed to be a group activity the shared responsibility was across both years. Second year students would take the lead in the tasks and further develop the outcomes in conclusion of the sprint contributing to their individual summative CAD submission. Whilst the first years played a valued supportive and contributory role, their work would be part of their summative portfolio demonstrated through their personal research and design development. Overall, the learning outcomes for both year groups focussed on building their professionalism, practice and understanding of design/business methodologies whilst aligning the learning outcomes to the relevant IED framework.

## 5 CONCLUSION & RECOMMENDATIONS

The conclusions drawn from the evaluation and reflection of the design sprint have helped inform future delivery of this project in future years. Key insights highlighted have identified that planning needs to include all external/internal partners and commence months in advance. A pre sprint activity is vital to inform the main sprint event; to establish the working model for students, but also to trial the event for academics and external partners. A core sprint team that is clear on their responsibilities needs to be in place. Miro and MS Teams should be integrated into any future plans to build in flexibility and transparency whilst connecting with external collaborators regardless of the setting. The Design Sprint project has provided an interactive methodology that is now integrated into the BSc Product Design curriculum at NTU. Although typically undertaken in person, the COVID-19 pandemic created a disruptive influence on collaborative learning and the design sprint presented an opportunity to encourage collaborative/interactive learning in a different way. Instead of delaying the delivery of this project, the team at NTU utilised the design sprint thinking by adapting it into an online programme through digitisation and collaborative/cooperative learning.

Despite using an online format, this project created greater collaboration between year groups that ordinarily would not have been realised. Our structure allowed less confident students to engage equally within an active collaborative space through the use of digital tools i.e., Microsoft Teams and Miro. The immediate success of the design sprint was realised through the delivery of several pre-sprint activities that engaged key stakeholders and embedded knowledge prior to the event. The challenge for this project was to not only to provide continuity of engagement over five consecutive days but to further encourage students who had never met to work together to work collaboratively. Student feedback highlighted:

*'The design sprint was a fun yet challenging experience. We were able to develop our skills working collaboratively through digital platforms ensuring we met deadlines, considered the users environment, and solve the problem at hand. Our team thoroughly enjoyed working with Future Nova.' [7]*

One of biggest challenges faced was the mixing year groups/peer groups. It was key for groups to become self-supportive before the start of the design sprint. The curation of the digital space was key to the success of the adoption of the methodology. This project has unlocked further potential for adoption of hybrid design sprints. The sprint has demonstrated the benefits for academics, students, and industry partners to work collaboratively regardless of the setting. Finally, we strongly recommend the cross-cohort delivery of design sprint projects due to the promotion of peer-to-peer support across cohorts which to date now continues beyond the design sprint project.

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