

# Adapting service design tools to facilitate interdisciplinary research collaborations

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## Abstract

This paper describes an ongoing multidisciplinary research project which is developing and prototyping a new food service for older hospital patients. This is a multi-faceted project combining the skills of designers, food sensory scientists, dietitians, medical sociologists, ergonomists and technologists with a diverse group of end users and stakeholders to map the existing food service and identify opportunities for re-design. This paper describes how three design methods/tools conventionally used by designers have been adapted and used to collaborate with colleagues from different non-design disciplines.

**KEYWORDS:** multidisciplinary, design methods, design tools

## Introduction

Six out of ten older people are at risk of becoming malnourished or their situation becoming worse in hospital (Age Concern, 2006) and those aged over 80 admitted to hospital have five times the risk of malnutrition than those aged under 50 (BAPEN, 2003). Malnourished patients stay in hospital longer, are three times as likely to develop complications and have a higher mortality rate (BAPEN, 2003). The toll of malnutrition on healthcare costs is estimated to exceed £7.3 billion per year, half of which is expended on those aged 65+ (Age Concern, 2006).

A multi-disciplinary group of researchers in the UK is working towards addressing this issue through a three-year project funded by the cross-Research Council New Dynamics of Ageing (NDA) programme (NDA 2010). The overall aim of the project is to address the crisis of malnutrition by designing a new food service prototype based on qualitative evidence, that considers foods, products, people, environments and procedures and which is amenable to becoming embedded in practice with the intention of reducing malnutrition and enhancing quality of life.

In order to fully address the problem, all stages of the food journey, from preparation to consumption, are being considered: these include the type of food product and its preparation, the maintenance of the quality of the food in the journey from preparation to patient, the environment and conditions in which the patient eats, incentives to eat, and the monitoring of food and nutrient intake.

## Multidisciplinary team

The multi-disciplinary team includes the following specialisms: nutrition, dietetics, medical sociology, food sensory science, design, ergonomics, computer science, and elderly care medicine. This multi-faceted project would not be possible to conduct within any one of the single disciplines involved. Previous research into malnutrition has tended to focus on single issues in isolation, whereas this project deals with all the people, procedures, places and products concomitantly.

User participation in the development of the new service will enhance the impact of the outcomes. The project's user group includes representation from a 'food family' (FF) (a diverse group of end users including food producers/caterers, nursing staff, ward volunteers, dietitians, speech and language therapists, physicians, carers and older adults), relevant key stakeholders (KS), and charities. The project steering group includes representation from KS including the NHS, professional associations, and charities such as National Patient Safety Agency (NPSA), Age UK and BAPEN.

## Tools for collaboration

In addition to design research activities, there is also a role for the designers in facilitating communication and understanding of the design process between the diverse disciplines in the research team. This enables a 'joined-up' approach towards solution generation and structures forward thinking.

In order to do this, the designers have employed design tools widely used by the service design community and adapted them to allow them to be used collaboratively by non-designers. The tools permit the sharing of knowledge and ideas and demystify the design approach for the rest of the research team. This is distinct from the design tools which have been used with the FF and KS at interactive workshops (e.g. personas, storyboarding and service prototyping). Where previous research highlights the value of these tools for engaging users in design projects, this paper proposes that the same tools can be adapted to facilitate non-designers within the core research team to collaborate in the design process.

What follows is a discussion of the tools used, details of how they have been adapted or naturally evolved for interdisciplinary use and a discussion of the resulting benefits for collaboration within the research team.

## Tool 1: Visual mapping

The objective of initial fieldwork conducted by the team's research sociologists was to determine the 'status quo' of the existing food service and practices through a series of

interviews and field surveys. The understanding of this status quo was compiled through a series of visual maps which converted the fieldwork data into information graphics as an aid to communicating this both within the research team and also with the FF and KS in its consultation workshops.

The fieldwork which provided the data for the visual mapping process was undertaken by researchers from each of the main disciplines:

- » Qualitative data obtained from ethnographic observations of the food journey by the sociologists. This formed the bulk of the data, and was written up as notes in a rich, narrative style.
- » Quantitative data collected by the food sensory scientists. This included temperatures, food journey times and food preparation processes.
- » The results of sensory food tasting sessions undertaken by the food scientists which compared the hospital food before and after the food journey.
- » Observational notes and sketches by the designer detailing user research undertaken at mealtimes in the patient eating environments.
- » Input from the FF and KS was included as a map of key themes from interview data analysed by the sociologists.

The narrative style accounts were analysed by the designers and translated into visuals which mapped people, products and processes onto locations in the food journey. The quantitative data were mapped onto a timeline to allow comparison of the different catering systems and processes. This was supplemented by photographs of all stages in the food journey, including products, environments and foods.

#### **How was this approach adapted to involve non-designers?**

This visual mapping approach was made accessible to non-designers by involving them from the early stages. We began this process with a meeting of key research team members, for which the designers prepared simple sketches of the system to begin the discussion. The sociologists and food sensory scientists were able to explore the sketches, making corrections, adding information and answering questions that arose. Layers of information were built up until the maps became rich representations of the service. Following this initial meeting the designers circulated the updated maps. The maps were then iteratively and collaboratively developed until the research team were confident that they represented an accurate and complete picture of the food service.

#### **How did this tool benefit collaboration?**

By collaboratively creating the maps the research team developed a shared understanding of the system which benefited from the perspectives of each different discipline. The sociologists and the food sensory scientists found the process engaging and insightful.

## **Tool 2: The workshops**

Following the initial ethnographic study and mapping of current systems, a series of workshops with the FF and KS were held to validate the findings and initiate ideas for the re-designed food service. Subsequent workshops/focus groups will be held to evaluate the new service prototype as part of an iterative development process. The workshop activities and outcomes are fully described in a separate paper by the authors (Macdonald et al 2010).

The workshops can also be thought of as a tool for collaborative *interdisciplinary* (as distinct from multidisciplinary) working within the research team. To date the research team have

designed and delivered two very successful workshops; the results have formed the basis of a new service concept currently in development.

The activities and their intended outputs were designed to meet the requirements of multiple disciplines. The delivery of the workshops also involved the entire research team, therefore it was essential that they fully understood and embraced the participative approaches proposed.

#### **How was this approach adapted to involve non-designers?**

Each of the workshop activities were fully scripted to assist the facilitator assigned to the activity and to ensure that all relevant and essential points were covered. Through the iterative development of the 'workshop script', the designers were able to facilitate the process of successful interaction between the different research specialists represented in the team. This document made the process of workshop design, development and delivery accessible to non-design disciplines.

The script served to: clearly define the purpose and desired outcomes of each activity to ensure all team members had confidence in the activities and their role in participating/facilitating them; allocate roles and responsibilities and specify the resources required; familiarise the team with the workshop materials prior to the event and provide a 'running order' for the day.

The designers avoided the use of design terminology as this tended to be off-putting and led to misunderstandings. The iterative development process also served to test the scripted explanations of the activities which would be delivered to workshop participants, filtering out any unclear design terminology that was not picked up by the designers.

#### **How did the workshops benefit collaboration?**

Supported by the detailed workshop scripts, the non-designers gained confidence in an approach which was outside of their usual professional 'comfort zone'. They embraced new methods and benefited from witnessing and participating in the approach first hand. In addition, the collaborative delivery of the workshops was an opportunity for the research team to be co-located for several days; working intensively built strong team relationships.

### **Tool 3: Service narratives**

The research team are collaboratively developing a set of service narratives which illustrate the role of each of the people, products, places, infrastructure and procedures in the new service concept. This approach is a natural extension of the persona and storyboarding techniques which have been introduced to the research team, FF and KS through workshop activities.

To fully appreciate how the service works for all concerned, the service narratives have been developed around a set of particularly challenging or problematic nutritional issues for three vulnerable groups of patients. This set of narratives is intended to illustrate improvements over the status quo and how the new food service proposal meets the project's objectives.

Each narrative introduces the patient with any relevant background information and follows them through typical days in their hospital stay: from admission to discharge. The narratives describe the patient's main nutrition-related events, excluding details of medical interventions and regular nursing care. Alongside this description we highlight the system actions and product interactions required to achieve this. The narratives also demonstrate

staff and carer/family interactions with the patient and the system. The completed narratives will form the basis for future work such as storyboards, service blueprints and design briefs.

### **How was this approach adapted to involve non-designers?**

The service narratives were created as simple text documents, which enables them to be edited by all members of the research team remotely. The service narratives were introduced to the research team with a short summary of their intended scope and purpose.

Rather than simply being a tool for the designers, the dietitians and food scientists have adopted the tool as an opportunity to specify the technical requirements for new foods and build in an understanding of the protein and kcalorie intake throughout the day.

### **How has this tool benefited collaboration?**

The 'service narratives' have proved to be a very effective tool for collaboration. The narratives have helped the research team determine any problematic issues in the conception of the service and any elements which may have been overlooked. Detailed narratives will help specify the various service elements and help in the briefing of designers and technologists involved in producing prototype elements. They will also be used in selected interviews with FF and KS to validate the concept prior to the service prototype development.

## **Conclusion**

The designer's toolkit is extremely useful in a multidisciplinary research project. While care must be taken to explain the scope and purpose of the tools and ensure design terminology is removed from the process, the methods developed for participative service design can be adapted into accessible tools for collaboration within a multidisciplinary team.

The tools have allowed a greater collective synergy between the disciplines and have provided the means for separate disciplines normally inclined to stay within their own discipline 'silos' to work together and exchange knowledge. In a multidisciplinary project where the primary outcome has a design focus, we have found that it is the designers' responsibility to drive this process, and innovate or adapt tools to enable interdisciplinary collaboration.

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