

An Inclusive Design Methodology for Redesigning the Food Service for Vulnerable Older Adult Hospital Patients

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ABSTRACT

A multidisciplinary team, funded by the UK cross-council New Dynamics of Ageing programme, is developing and prototyping a new food service for older patients (stroke, dementia and hip fracture) vulnerable to in-hospital nutritional problems. Designers, food scientists, dietitians, medical sociologists, ergonomists, and technologists are working together with key stakeholders and a 'food family' to understand the needs of the food provision from patients' perspectives, to 'map' the food service and to identify opportunities for improving the service for all. Major opportunities for service redesign guided by a set of service principles have been generated through an inclusive design methodology. This is leading the team towards a new prototype food service that considers new food products, the design of tableware, the patient eating environment including furniture, food service provision, and a responsive information management system which monitors nutrition consumption and responds to individual nutritional needs. This paper discusses the results of the inclusive, participative and co-design methodology deployed in the initial phases of the project to engage the food family, stakeholders and the separate discipline specialists within the research team.

Keywords

Hospital food service; older adults; inclusive design methodology

INTRODUCTION

The existing food service for older hospital patients in the UK creates significant problems contributing to unacceptable levels of malnutrition (Bapen 2003, Age Concern 2006). A three-year multi-disciplinary research project, funded by the cross-research council New Dynamics of Ageing programme, is concerned with redesigning and prototyping the food service for particularly vulnerable groups of older hospital patients suffering from stroke, dementia and hip fracture. The project is known as 'mappmal', a multidisciplinary approach to develop a prototype for the prevention of malnutrition in older people in hospitals to include products, people, places and procedures (New Dynamics of Ageing 2010). This project presents the mappmal team with a complex set of challenges. Many previous attempts at addressing hospital mealtimes and food provision have proved problematic, resulting in partial solutions which do not address issues holistically, fully engage stakeholders, utilise their experience and knowledge or exploit opportunities offered by new technologies.

This paper discusses the comprehensive and inclusive design methodology that the designers developed to enable mappmal's specialists in food science, dietetics, medical sociology, ergonomics, technology and design not only to work together cohesively as a team but also with the key stakeholders (KS) and 'food family' (FF), i.e., food producers, caterers ward staff, nurses dietitians, physicians, speech and language therapist, occupational therapist, carers and older people, who are involved in the process of assessment and care of patients and in preparing and delivering their food.

METHODOLOGY

At project midpoint (2010), the use of the design methodology in addition to some of the wide range of design skills deployed in defining the essential elements of the food service are described here rather than the findings of the research *per se*. Various methods were designed for use in a number of activities within a series of workshops in the ‘pre-design’ phases of the project. These were adapted from methods traditionally used by the design profession for guided use in this large multi-disciplinary team with the aim of making the service design process as participative and inclusive as possible. Figure 1 provides an overview of the methodology used in mappal.

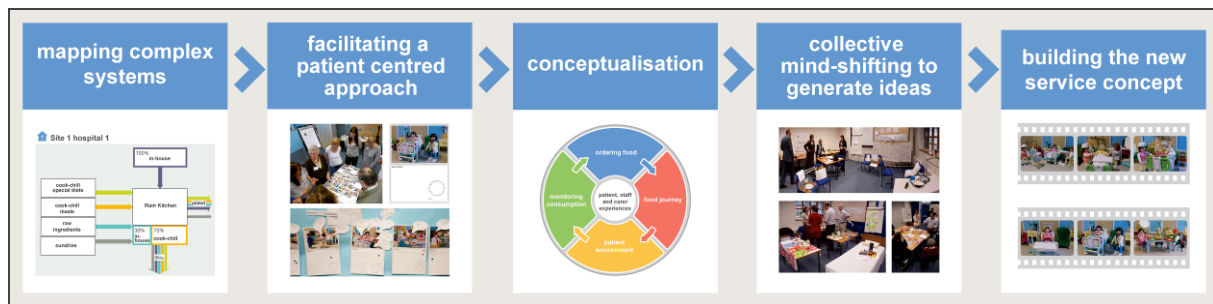
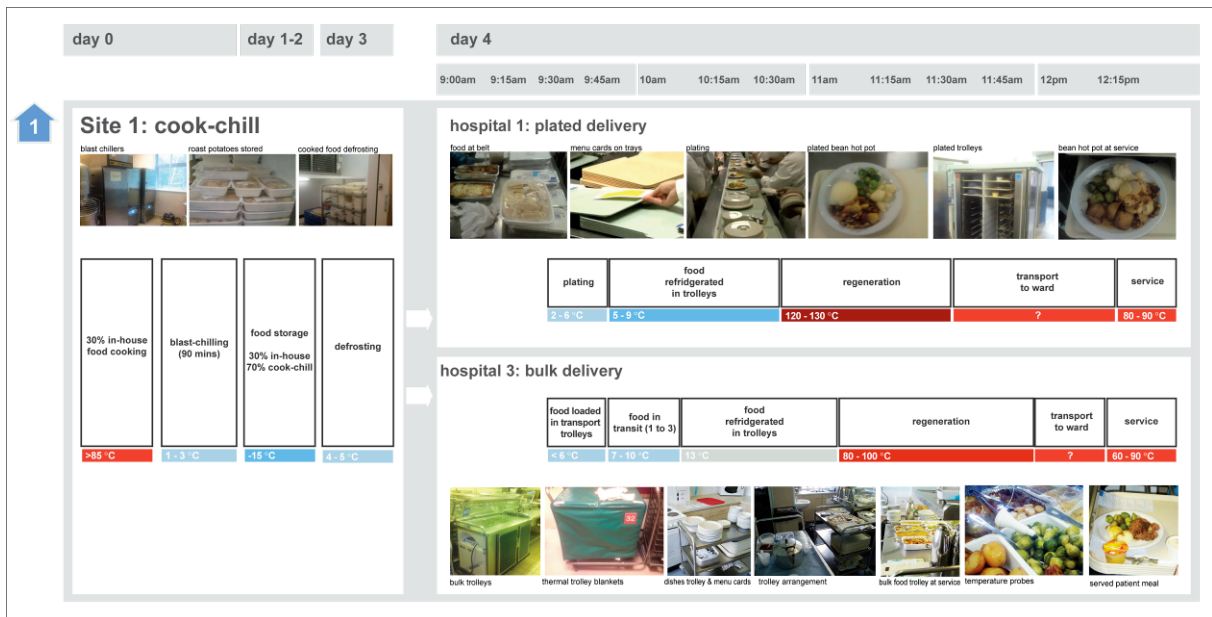
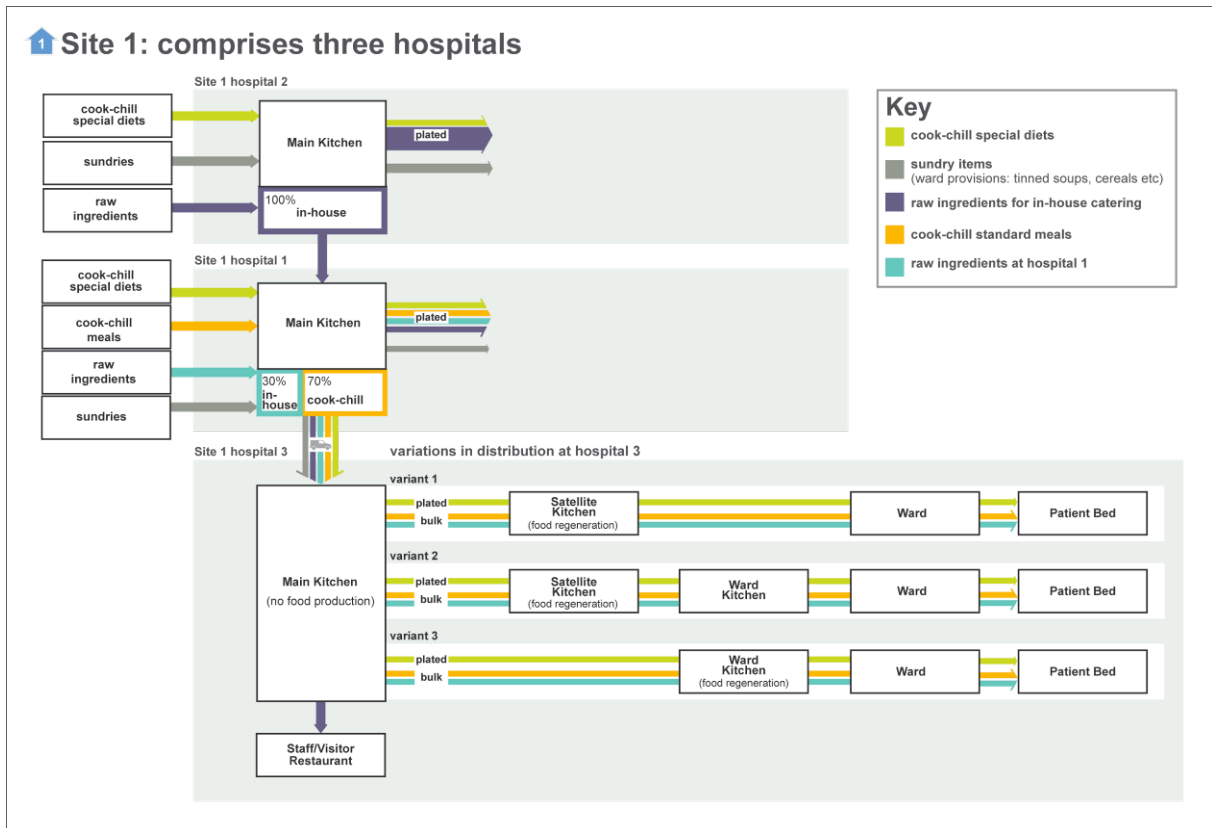


Figure 1. The main stages in the design methodology used to develop the mappal food service blueprint.

Mapping and evaluating the complexity of the food service

The mappal team conducted a comprehensive review of the ‘status quo’ of the existing food service in order to understand the many inter-related issues which contributed to the challenge of providing adequate nutrition to older patients. This was a precursor to determining and specifying the essential and desirable key features of a new service provision and subsequently to develop a prototype of the new food service. Data from KS and FF interviews by the medical sociologists in the team revealed that each had knowledge and experience of discrete parts of the existing food service but that very few had a clear over-view. Using information design techniques, interview, observational and scientific data were translated into a comprehensive series of visual mappings of the service. Some of these maps visualised the service from a macro perspective (Figure 2a), showing the ‘food journey’ overview, i.e., point of origin of the various elements, ingredients and the journey these took through the hospital catering system, sometimes passing through kitchens at more than one site before ending up in a ward kitchen and at a patient’s bedside. Other maps focused at a more micro level showing who was involved at what points, the timing and sequencing of events in the assessment, the detailed process of request for and supply of meals for special diets patients, while yet others were concerned with temperatures of food, e.g., in a meal cook-chill scenario, as food temperature was considered to have a bearing on sensory appeal, (Figure 2b). A total of eight different maps were produced. Researchers’ initial findings and understanding of the ‘status quo’ of the food service represented in these mappings were validated in the first of a series of interactive workshops designed for the KS, FF and mappal team members where the objectives were to establish if: i) the maps were accurate in showing the macro- and micro-stages of the food journey, ii) there were any stages or processes missing, iii) there were any issues with the ‘food journey’ as it stood and iv) how one would prioritise these issues. This process and the outcomes are discussed in more detail in Macdonald, Teal & Moynihan (2010).



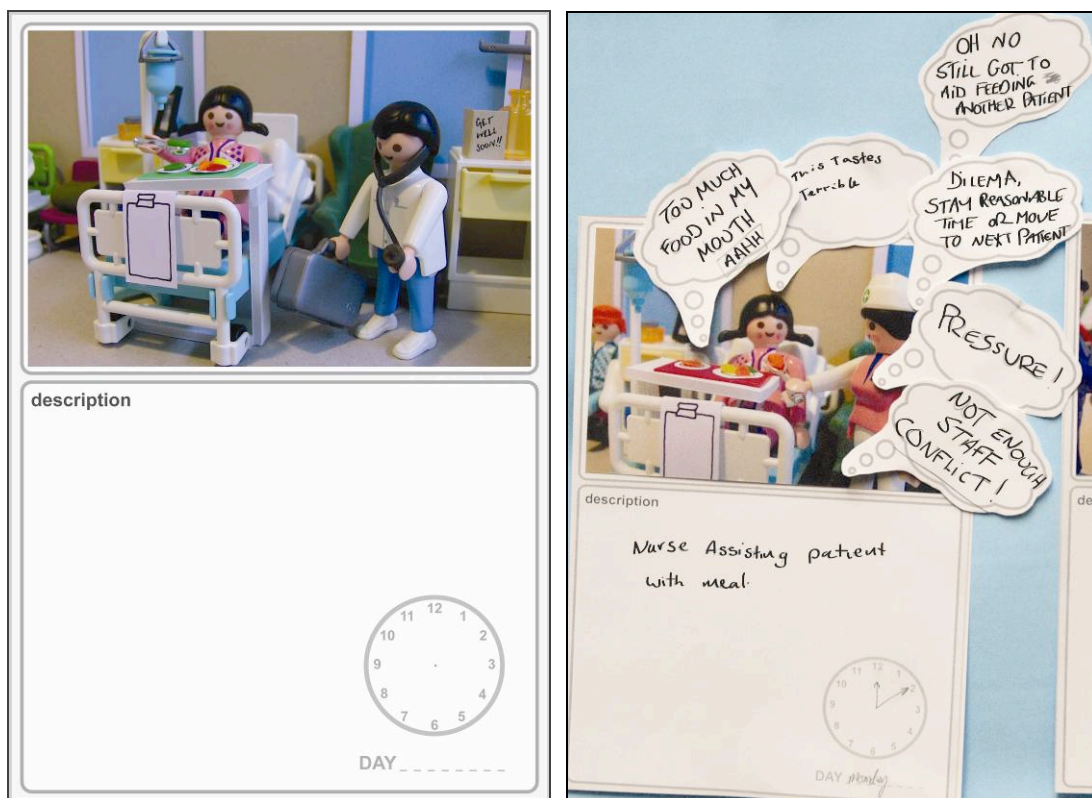
Figures 2a and 2b showing examples of the macro- and micro-mapping of the food journey.

Understanding the patient experience: personas and scenarios

Despite the many FF and KS individuals involved in the food service, the patient is the only individual who experiences this as a totality and therefore it is essential to understand the food service from the patient's perspective. However, due to ethical and practical issues it was not possible to involve these acutely ill patients in the workshops directly. Although the design and development of personas and scenarios (conveyed through storyboarding) are well-established design techniques there is some debate about their use and their value due to their potential to stereotype end users and simplifying

real-life scenarios. Consequently the designers provided the FF and KS with the means to create their own personas and mealtime scenarios: collectively the FF and KS had deep and intimate knowledge of patients' experiences. The designers created persona and storyboard template tools that elicited the specialist knowledge and understanding of patients, patient issues and mealtime scenarios from - and which were usable by - the FF and KS themselves. This formed one of the mappmal workshop activities where each FF and KS team was asked to build a different profile for a particularly vulnerable patient type and then to create a storyboard of a mealtime scenario (for before, during and after the meal) from their patient's perspective: this highlighted the key issues (both positive and negative) for that patient during that mealtime scenario. A blank storyboard was provided with a set of individual storyboard frames to allow the FF to quickly and effectively build their stories. The designers had previously spent time observing mealtimes in the hospital setting in order to determine realistic contextual settings which were recreated as a comprehensive and versatile set of scenes using playmobil® scenarios (Figure 3). Speech and thought 'bubbles' were also provided in addition to these scenes to encourage the KS and FF to think about the staff-patient interactions and feelings of patient and staff at specific stages in the mealtime scenario to highlight problematic issues.

Both the personas and the storyboards were found to be useful tools. In the example illustrated (Figure 3b), the patient's thoughts reveal that she is being fed too much food at once and doesn't like the taste; the nurse's thoughts reveal she feels under pressure to finish feeding the patient as they are short staffed and she has other patients to assist. Whilst these scenarios tended to reflect the complexities of patient problems and mealtime issues, the activity itself also served three other functions important for subsequent activities: i) it helped team-building to bring together a disparate group of KS and FF participants from different disciplines to focus on a common purpose; ii) it developed a patient-centred perspective; and iii) it developed skills in rapid scenario-building using the tools provided. In addition, the scenario-building using the playmobil® photographs proved to be a popular and immediately accessible method which was used in further workshop activities as a way of communicating future concepts.



Figures 3a and b showing examples of the a) blank and b) completed storyboard frames.

Overcoming inertia 1: conceptualisation of the key issues in the food service

One of the key design challenges in projects of this type is working with individuals who, no matter how positively they wish to contribute, may be so inured to change by the scale and complexity of the challenge (“we can’t do this in the National Health Service (NHS) because...”) that overcoming chronic inertia might be perceived as too problematic. Consequently, the careful design of activities which could help demonstrate a positive and structured route forward was vital.

As the current hospital food service proved such a complex system, the team had to develop a framework to facilitate discussion and conceptualisation of the key issues arising from the existing service which represented the priority challenges for the mappmal team. The issues identified from previous interviews, observations, mappings, personas and scenarios were analysed and synthesised into a four-part conceptual service framework. This framework was used as the basis to structure further KS and FF group activity, i.e., the first of the ideas generation stages in designing an improved food service. The four main issues which were reflected in the framework were: i) the process and means for choosing and ordering appropriate and appealing food; ii) the process and means for preparing, delivering and presenting food and ensuring its quality; iii) the environment for, means and experience of eating food, and iv) the means of monitoring and evaluating food and nutritional uptake (Figure 4).

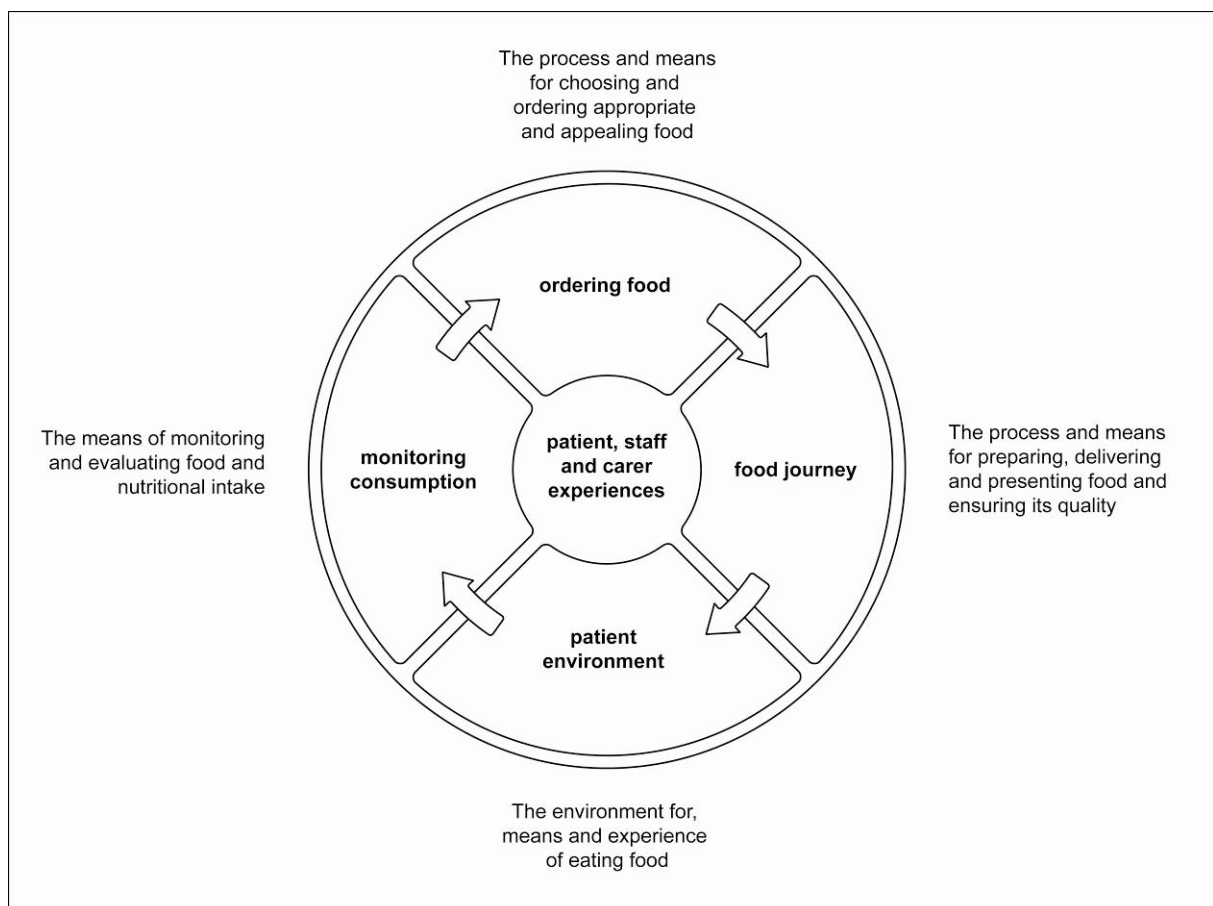


Figure 4. The conceptual service framework

Overcoming inertia 2: collective mind-shifting to generate new ideas

One of the FF and KS workshop activities was designed to use the conceptual service framework as a means for considering how an alternative (non-NHS) service organisation might provide a food

service for older patients within the NHS. The organisations chosen were: i) an armed services catering corp; ii) a consumer-oriented food retailer; and iii) a popular lifestyle computer systems retailer. The objective of such an activity was to help lead the KS and FF into a different conceptual 'space' where they suspended their usual habits of thinking and judgment and started to imagine an improved quality food service experience for patients. The conceptual service framework tool provided the KS and FF with an easy-to-use means of advancing and structuring their ideas, overcoming the inhibiting complexity of the actual service. This approach proved successful as evidenced by the free creativity of ideas generated and the absence of negative comments or constraints. This is described in further detail in Macdonald, Teal & Rice (2010).

STIMULATING IDEAS FOR THE NEW SERVICE

Personas and scenarios revisited

From the researchers' field work, literature and workshop findings, a number of common themes emerged such as the need for personalisation and adaptability of the food service as well as opportunities for new technologies to mediate the catering-patient interface and to facilitate communication of individual needs and preferences throughout the food service. The patient persona method was revisited but this time, as the requirement for personalisation of the service was one of a set of service principles which were emerging and which were being used to guide the development of concepts, this time the persona development was much more focused on how the new hospital food service might be responsive to an individual patient's specific needs and preferences. Rapid development of the persona was facilitated by a set of pre-prepared visual prompt cards which helped articulate visually, e.g., the type of foods and eating environment preferred by their patient. New service ideas were prompted using a set of five key identified opportunities and six service principles for guidance using questions such as: "how could the <opportunity> improve the nutrition of older people in hospital?", "what would the ideal <opportunity> be like for an older person" and "how would you personalise the <opportunity> to the needs of a specific older vulnerable patient?". Whereas previously storyboarding had been used to describe a patient mealtime scenario, storyboarding was now used to structure the ideas resulting from the brainstorming and to begin to describe a 'food service story'. Storyboards were used as the basis for rapidly mocking up ideas and enacting out prototype ideas and to develop simple service prototype 'mock-ups' using prompts such as "what characters/roles do we need to enact the new service?", "How would the patient tell them apart?", "What objects/products might we need to make?", and "How can we 'set the scene'?". These prototypes were then 'tested' with team members role-playing as patients. It was clear that by careful design of the persona and scenario methods, the FF and KS had not only adopted but were becoming proficient at using these methods which had traditionally been used by designers.

New service elements

From such workshop activities and from further auditing and analysis of the team's research, the individual elements of an improved service redesign began to emerge guided by the service principles. These service elements were grouped under four main headings, as follows:

- **People:** to consider the needs of individual patients (stroke, dementia and hip fracture), hospital staff, and carers.
- **Procedures:** to include the management of tailored patient requirements information, food ordering and nutrition monitoring.
- **Products:** to include the design of tableware, electronic systems design, and personal digital products for data management.
- **Places:** to include the design of the bedside environment appropriate to the three vulnerable groups, and to take account of privacy, communal eating, functional, ergonomic, aesthetic and social requirements. Figure 5 illustrates some of the new service elements.

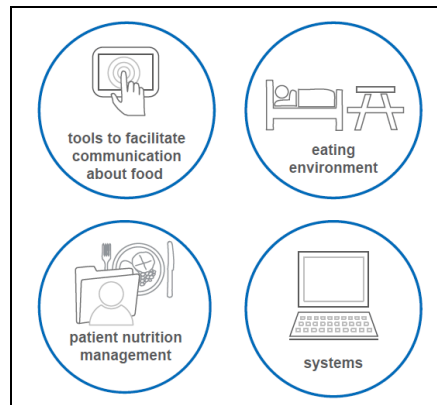


Figure 5. Examples of service elements

Developing a service blueprint through a narrative process

The role and validity of each of the new service elements was tested through a narrative process. A number of simultaneous narratives told from different perspectives are currently being used to develop the new service blueprint. Firstly, the goal of the dietitian narrative was to ensure that calorie and protein intake met daily targets, so this narrative explored what role the various service elements and technologies would play in helping to respond to patient nutritional needs and to monitor intake. In this way, the functional requirements of, e.g., smart ordering and monitoring technology, and the role and timing of new specially designed foods and meals (developed by dietitians and nutritionists in the team) could be understood. Secondly, the goal of the patients' narratives (told by proxy) was to determine how the service presented itself to the patient in welcoming the patient, in making the selection of meal options, eating and mealtimes as stimulating, attractive, and non-medicalised an experience as possible, and as sociable or private as appropriate. The carers', FF's and other professionals' narratives were added to create a richness. A further parallel type of service narrative is told from a 'back-of-house' perspective, to include the backstage workings and elements of the information management system. Through these narratives the 'line of visibility' can be drawn to differentiate processes which are only visible to the service provider, i.e., the back-of-house functions from those which the patient experiences. The system is also required to factor background knowledge of an individual's dietary needs (including cultural requirements and personal preferences) into the new service. At each stage of the food journey 'touch points' of the patient experience were identified such as how the menu is presented and menu options selected, design of tableware and cutlery, bed eating environment (as these are acute patients) and how these would be considered alongside detailed layered information about the processes, environment, timings, food variation and quality levels. This will be represented visually by the designers using an adaptation of 'service blueprinting', a technique widely used in the service design field and which was used to describe "customer journey and parallel processes mapped out in sufficient detail to identify possible fail points and evaluate performance variables" (Shostack 1984). This technique has been further developed by McBride (2008) who suggests an additional line of visibility to separate processes not visible to the service provider, for example patient-to-patient interactions. Mager & Evenson (2008) advise that further information should be added to the service blueprint to "capture the 'soul' of the service, and communicate the facilitation of the experience". Detail describing the interactions and touch points in the food journey will provide this supplementary information.

CONCLUSION

One of the significant challenges has been to develop methods to enable the whole team to understand the service from the perspectives, needs and preferences of acutely ill patients by developing a patient-centric approach. The description above of some of the many design methods used in the pre-design phase of this multi-disciplinary research project illustrates the expanding set of skills in the designers'

methodological toolkit. To address a project of this complexity, the designers have had to develop and evolve a set of methods and build these into a robust and participative design research methodology. Methods which previously might have been used exclusively or predominantly by designers have been adapted to be usable, in this case, by other non-design professionals in the research team, and also by the KS and FF, to enable them to be included as co-designers in the service design and innovation process.

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