# Appendix 3 – Interview Results

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The following is a list of the interviewee's and any notable comments they made about the requirements of the system, and the system itself. As it would be impractical to summarise every single point that was made for every single requirement each interviewee summary only contains the ones that the participants felt most strongly about and spoke about in detail. Any queries about the wording of particular ambiguous requirements have been updated in the requirement specification and the change information has been altered to represent the alteration in wording.

## Interview number: 1 Date: 02/04/2014

#### Interviewee name: Oliver Cumming

Oliver has lived in 3 different student houses, sharing a kitchen with 4 other people each time.

As an Information Systems student, Oliver didn't need an explanation of what pervasive computing was as he had covered it in a module on his course. He had a good understanding of technology and required no help with the explanations of the requirements.

As he was reading through the requirements he expressed a concern over the dangers and security with the requirement (later labelled FR-SC06) that stated that all devices could be controlled manually. He did express an enthusiasm for this requirement as on numerous occasions he has "not known what food I have had in the house and was unsure whether to go to the shop on the way home".

Another idea Oliver had, was to introduce an option that enabled contactless scrolling. His mobile phone boasts a function that can track the movements of the eye and automatically scrolls depending on what the eyes are focussed on. This lead to a discussion about other methods of contactless scrolling and a conclusion was arrived at that it would be an excellent function for the kitchen if the interfaces could be controlled by eyes or hand gestures.

Oliver lives in a house where the kitchen is the area for where he holds his gatherings with other students and stated that kitchens are not only areas for cooking, but for 'mini-parties'.

He believes an interactive surface and inbuilt speakers would be ideal for this. Once requirements to solve this (later labelled NF-UI01 and FR-EC02) were added he felt that the requirements specification solved the problems he faced in a student kitchen to a high extent. There were no requirements that he felt were unnecessary to the student population as a whole.

## **Interview number: 2**

Date: 02/04/2014

#### Interviewee name: Christopher Earnshaw

Christopher has lived in 2 different student houses sharing with up to 10 people. As an Information Systems student, Christopher didn't need an explanation of what pervasive computing was as he had covered it in a module on his course. He had a good understanding of technology and required no help with the explanations of the requirements.

Chris, again, had reservations about the security of a system that can send and receive information to and from devices. Chris seemed to query extensively the risks involved in implementing the system. While reading the specification aloud, he did state a concern about a lack of a contingency plan should there be an issue with the software of hardware responsible for the unlocking mechanism that allows unlocking of storage spaces with fingerprints (later labelled FR-UI01). This concern was stifled when he read the requirement that allowed a physical key to open storage spaces (later labelled NF-UI02). Chris confirmed that an override key was essential to the ease of mind of users.

Chris believes that the system implemented will solve the problems to a good extent, however specified that although he couldn't think of any problems that it the system does not counteract, he believed there would almost certainly be at least one problem that would become apparent after the application of the system.

Chris felt that no requirement was unnecessary to the student population as a whole.

Interview number: 3 Date: 02/04/2014

Interviewee name: Michael Juckes

Michael Juckes has lived in 3 different student houses sharing with 4 other people each time.

As an Information Systems student, Michael didn't need an explanation of what pervasive computing was as he had covered it in a module on his course. He had a good understanding of technology and required no help with the explanations of the requirements.

As an avid gym goer, Michael enthused about the idea of being able to count his calories and content statistics of the food he was eating. He also stated that he has never has food stolen and trusts his housemates so feels that there is no need to implement cupboard locks for him, he feels it could be an inconvenience for him so expressed a willing to have an option that leaves cupboards unlocked permanently.

From this observation Michael highlighted a number of requirements of the systems functionality that may be wished to be turned off by a user. He expressed a want to be able to 'free-pour' from the taps (although he did state that set volumes of water distributed was a good idea due to water and energy consumption), and manually cook.

On the whole Michael seemed enthusiastic about the system and saw it as an interesting and exciting concept. He feels that the requirements do solve the problems he faces in a kitchen and should his issues raised be implemented, then the system can become more of a 'silver bullet' for all students.

## Interview number: 4 Date: 02/04/2014

#### Interviewee name: Lauren Harper

Lauren has lived in 3 different student houses, sharing with 5, 9 and 3 other people. As an Information Systems student, Lauren didn't need an explanation of what pervasive computing was as she had covered it in a previous module. She had a good understanding of technology and required no help with the explanations of the requirements.

Lauren is very health conscious and believes that an inbuilt calorie counter would be an excellent addition to her kitchen. Lauren has a touch screen computer and tablet and says that it is not unusual for accidental interactions with the touch screen and believes that an

interactive surface would be constantly pressed accidentally, causing some big errors in the kitchen. If that problem could be solved she thought interactive surfaces would be an excellent and fun addition to a kitchen.

Lauren did raise concerns about automated cooking however as she said she sometimes likes to get creative in the kitchen with no plan or set ingredients and believes the proposed system can be a bit rigid, somewhat restraining creativity. She wanted an option where completely manual cooking was possible.

Lauren believes that if solutions to the touch screen and options for manual cooking are not implemented then the system would cause more problems than it solves. If her suggestions were taken into consideration then she believes that the system would solve the problems in a student house to an adequate degree but believes that the novelty of such a cutting edge kitchen will wear off and new problems will arise.

## Interview number: 5 Date: 02/04/2014

#### Interviewee name: David Owen

David has lived in 3 different student houses, sharing with 3 and 5 others. As a theology student, David had no knowledge of the term 'pervasive' but has a keen interest in technology and was familiar with the concept. David did need some explanation on the functionality of some requirements as he felt that they would not be realistic, he was put at ease with every one of his queries with some examples of how emerging technology makes them possible.

As a student that lives in a house with all males, David was particularly enthusiastic with the requirements that looked to help maintain a clean and tidy kitchen. David was sceptical about a requirement that allowed pans to self-clean as he didn't believe it to be a feasible concept, or trust that it would clean to a satisfying level. He was eager to see a method that cleaned kitchen utensils in an almost instantaneous way. He believed dishwashers to be an extremely useful tool in the kitchen but felt that they took too long to wash, and if he needs an item to cook with that is dirty, he will often change his mind about what to cook as he

doesn't want to wash up items just so he can use them. When asked about feelings on a high performance 2 minute dishwasher he felt that this would contradict his reservations.

David could not think of any issues in the kitchen that were not solved by the requirements analysis.

# Interview number: 6

## Date: 02/04/2014

#### Interviewee name: Elliot Brookes-Parry

Elliot has lived in 3 different student houses sharing a kitchen with 5 other people each time.

As a History student, Elliot had no knowledge of the term pervasive but he seemed to understand the concept without any difficulty once it was explained to him. Elliot does all of his shopping online for periods of up to 2 weeks. His opinion on the shopping list tool was although it was a useful feature; there was not much point in compiling a shopping list, only to then have to then copy it into an online shopping site. Elliot pointed out that many students do not own cars and find that online shopping is an easier way to shop. Elliot particularly liked the voice activation features and the automated taps, although he did state that a free-pour function was necessary.

On the whole Elliot could not think of any problem that he had ever faced in the kitchen that the proposed system didn't solve.

## Interview number: 7 Date: 02/04/2014

#### Interviewee name: Jake Astley

Jake has lived in 3 different student houses living with 4 and 5 others. As an Engineering student, Jake didn't have any prior knowledge of the term 'pervasive', but understood it when it was explained to him. Jakes seemed pay special attention to the practicality of the system.

Jake raised concerns on the usability of the system with others also using it. His opinion was that the system was excellent if one person was using the system at a time but correctly stated that that wasn't the case in student kitchens. He thought that there would be issues with multiple users using different interfaces and didn't think it would be a good idea to only be able to use one interface at a time as it could mean a lot of user movement around the kitchen, going from appliance to interface repeatedly. At first Jake was unsure of a solution to this problem, but after discussion a requirement was created that solves this problem (Later labelled *FR-IMO2*). Jake confessed to being untidy in the kitchen, sometimes not doing his washing up and expressed an eagerness for self-cleaning pans. When offered the feedback given by David with regards to self-cleaning pans being impossible, but being replaced by an alternative '2 minute dishwasher', Jake agreed with David's feedback and thought that would effectively solve the mess issue with a student kitchen.

Jake felt that the requirements solved every problem he had faced in a student kitchen and thought that if the practicality issues he had highlighted were solved, the system would be excellent.

## Interview number: 8 Date: 02/04/2014

#### **Interviewee name: Robert Matthews**

Rob has lived in 3 different student houses, each living with 5 others. As a Journalism student, Robert didn't have any understanding of pervasive computing and it took some explaining for him to reach a basic understanding of the concept.

Robert enjoys cooking and often uses recipes to cook a variety of new things that he hasn't attempted before. He liked the idea of the system being able to find recipes based on what he had in storage and thought it was an excellent idea that the system can semi-automatically cook it once a recipe had been found. A concern of his however, was that sometimes he likes to be creative in the kitchen, and doesn't necessarily know timings of what to cook before he cooks it. An example of this he gave was roast potatoes. Sometimes he boils them for varying amount of times before roasting them for varying amount of times before roasting them for varying amount of times. He stated he would like the option to turn off all automated cooking systems and cook manually from time to time.

Robert doesn't mind doing washing up as it gives him something to do while cooking, although he did state that he wishes others would do more as the kitchen he lives in is constantly dirty. Robert thinks that the system does solve problems in a student kitchen and although not all of the requirements are necessary to him, he thinks that they are all necessary to students as a whole.

## Interview number: 9 Date: 02/04/2014

#### Interviewee name: Andrew Moyse

Andrew has lived in 3 different student houses, each living with 5 others. Andrew had heard of the term 'Pervasive Computing' before and already had a very vague understanding of it. He seemed to have a good grasp on the concept when explained to him.

Andrew seems to be a very frugal person, and expressed a keenness for the requirements that would save money, such as the appliances learning when they are never used so they can automatically power down, and automatic quantities of water produced from a tap that can deliver boiling water – saving energy on boiling a large kettle of water (although he did state there would be a need to free pour water).

Andrew has had disputes over other housemates not buying certain communal items when he feels that it is their turn to and as a result he has stopped buying and using communal items. He feels that a system that measures who has been using specific items would be useful in keeping the peace in a household but pointed out that it would be impossible to quantify how much of particular items have been used by people. When asked to elaborate on this, he pointed out the scales would only be sensitive to a gram and using communal items such as salt, or pepper will not register a change on the scales in cupboards. Andrew correctly pointed out that an edit of the requirement was necessary.

This was the only hole that Andrew managed to find in the specification and feels that the system would be a success in both delivering pervasion and solving issues in a student household.

## Interview number: 10 Date: 02/04/2014

#### Interviewee name: Campbell Harper

Campbell has lived in 3 different student houses, living with 6, 9 and 7 others. As a Politics student, Campbell had never heard of the term pervasive computing but understood it due to a mixture of the explanation provided, and futuristic films he had seen. As a result of this, his ideas and his expectations seemed to be a bit farfetched and although he admired the novelty of the system he found it difficult to accept the specification as one for a *completely* pervasive kitchen. Although he was technically correct in that sense it proved to be difficult to gain constructive feedback from Campbell.

When prompted to look at certain requirements he thought that any feature that could help keep a kitchen clean and tidy was a good one. He has previously lived in a house of 10 people and stated that it was very difficult to keep on top of the cleaning and tidying. Campbell liked the new idea of having a 2 minute dishwasher, although stated that in order for it to be truly pervasive, it should clean instantly. He said 2 minutes was an acceptable time however when the concept of 'Real-Time Computing' was explained to him. Campbell also stated that for the requirement (later named NF-SI02), that previously read "Up to 10 users' thumbprint can be registered for each cupboard", that 10 was the absolute minimum number as some houses hold 10 people already – regardless of guests, landlords etc. Although he disagreed with the level of pervasiveness of the system, he did agree that it was a start and did counteract the problems currently found in a student kitchen.

## Interview number: 11 Date: 02/04/2014

#### **Interviewee name: Rhys Annett**

Rhys has lived in 2 student houses, living with 6 and 9 others.

As a Spanish student, Rhys hadn't got an understanding of pervasive computing and as a self-proclaimed technophobe; he needed a lot of guidance when it came to going through the requirements.

Rhys was unsure that people with little or no grasp of technology could operate the proposed kitchen fully. He was keen for an option that allowed fully manual control of a kitchen as he didn't necessarily trust the software that ran it.

He believes that although on paper, thumbprint unlocking of cupboards was a good idea he stated that he wouldn't trust it all of the time, but was put at ease when he read the requirement (later labelled NF-UI02) that stated that there would be physical key slots. Rhys was more enthusiastic about the system as a whole when explained about the requirement that had been previously mentioned in research with regards to the system having a manual capability to use appliances.

Having lived in a house of ten, Rhys was aware of the issues involved with cleanliness and a large amount of people trying to cook at the same time. Rhys thought that self-cleaning pans was a brilliant idea but when explained that that may not be a feasible idea he was equally impressed by the idea of a dishwasher that washed in under 2 minutes. Although Rhys didn't spot the issue previously highlighted by Jake with multiple people using multiple interfaces, when it was explained to him, he agreed that there would have been a problem.

Although Rhys would have trouble trusting the system and may not use every aspect of it, he had no doubts that should it work properly, that it would abolish all problems that he knew of, in the student kitchen.

## Interview number: 12 Date: 02/04/2014

#### Interviewee name: Hollie Carter

Hollie has lived in 2 different student houses, living with 4 and 3 others. As an Information Systems student, Hollie didn't need an explanation of what pervasive computing was as she had covered it in a module on her course. She had a good understanding of technology and required no help with the explanations of the requirements.

Hollie is a self-proclaimed novice in the kitchen and particularly liked the requirements where it allowed the system to automatically find, and program in recipes. She says it would definitely encourage her to be more adventurous in the kitchen, and may even help her become more healthy – a personal goal that she has been meaning to start. Like every other participant of the interviews, she liked the requirements that would promote cleanliness of the kitchen. When explained about self-cleaning pans she agreed that it wasn't a feasible requirement but feels that a fast dishwasher would be an adequate substitute for this.

Because of the nature of her job and work preferences she has an erratic schedule. She feels that a self-cleaning oven would be an excellent idea although does not want to be put out by the inability to use the oven while it is cleaning as she often has short windows in which she can actually cook and eat food. She was sceptical about the feasibility of devices learning when they are mostly used but agreed that if it would be useful if it was implemented effectively. She agrees that at least it would be better than the oven starting a clean at completely random times.

Overall Hollie was impressed by the requirements, she felt that although some didn't apply to her needs she was confident that they were necessary for others and felt that the system had solved problems in a student kitchen "as well as they can be solved".

## Interview number: 13 Date: 02/04/2014

#### Interviewee name: Steph Germain

Steph has lived in 3 different student houses, living with 5, 7 and 8 others.

As a Medicine student, Steph had no prior understanding of pervasive computing and it took a lot of explanation to give her a basic understanding.

Being a medical student Steph is constantly very busy, although she does enjoy cooking. She believes the automatic recipe ideas and automatic programming of food is a fantastic idea as she is often has to fit in cooking around her workload and it often means sacrificing healthy eating and food she likes to eat. However, when she does have free time she feels that this requirement could get in the way of the enjoyment of cooking and feels that there needs to be the capability to turn off the automation of kitchen processes when it suits a user.

Steph likes to eat healthily and explicitly stated that it would be an excellent idea to have a calorie counter in the interfaces.

Overall she thinks that a system implemented to these requirements would certainly solve any problems she has encountered in a student kitchen.

## Interview number: 14 Date: 02/04/2014

#### Interviewee name: Maxwell Brookes-Parry

Maxwell has lived in 4 different student houses, living with 4, 6 and 5 others. Maxwell is a Sports Science student, and was unfamiliar with the concept of pervasive computing. He is however, interested in technology and it didn't take much explanation to give him a good level of understanding.

Maxwell doesn't enjoy cooking and was keen about any requirement that allowed the process to be made easier for him. A lot of the food he eats is pasta or oven food - food that has set amounts of time attached to their cooking. He relished the idea of being able to simply place the food on, or in, an appliance and have the system cook it for him. He was

especially amazed by the requirement of the system that allowed automatic look-ups of timings as "*it would save me* (Maxwell) *the job of having to put the timings in myself*". Maxwell is aware he eats very unhealthily and would not like to be reminded of that by health information on the interfaces. If he had the option he would turn off this function of the system.

Overall Maxwell did not think any requirement was unnecessary for him or others and believes that the system would solve problems in a student house to a great extent.

## Interview number: 15 Date: 02/04/2014

#### Interviewee name: George Green

George has lived in 1 student house, living with 2 others. Despite studying Engineering, George had a good prior understanding of pervasive computing.

Living in a house of 3, bills are an issue for George and his housemates as there aren't as many people to spit the premiums with. As he currently makes a conscious effort to be as energy efficient as possible he was very enthusiastic about the features that would save him money. He was especially pleased with requirement that provided details on utility consumption and cost (later named FR-EM03) and the requirement later (labelled FR-TC02) where quantities and heat of the water are recognised and distributed. This would mean water doesn't get wasted. He also liked the requirement (later labelled FR-EM05) where the system learns when the best times are to perform tasks and power down to save energy. Unlike the others interviewed George said he had never had a problem with mess in his kitchen, although he did admit he had only lived in one student house with only 2 other people so that could be the reason. Although George had not had a problem with the tidiness of his kitchen he conceded that appliances could be cleaned and tidied more often.

While for the most part, the requirements did solve problems in the kitchen, George feared that the system would consume a lot more power than current appliances do, and therefore cost a lot more to run.

## **Interview number: 16** Date: 02/04/2014

#### Interviewee name: Andrew Hammond

Andrew has lived in 4 student houses, living with 6, 3 and 7 others.

As a Sport Science student, Andrew had no prior understand of pervasive computing but seemed to understand it after a brief explanation.

Andrew is an indoor rowing world record holder so the nutritional value of food is very important to him. He was especially pleased with the feature that allows the user to view all nutritional information in the meal and its calorie content. He mentioned that fairly often he was finding new ways online to cook different types of food to ensure the most nutrition from them and stated that automatically programmable appliances from recipes he has found online would be ideal for him as he didn't always know the timings and methods.

On the whole Andrew thought that the requirements solved the problems in a student kitchen to a large degree. There were no requirements that Andy thought unnecessary for himself or others.

## Interview number: 17 Date: 02/04/2014

#### Interviewee name: David West

David has lived in 4 different student houses, living with 7, 5, 4 and 2 others. David is a Psychology student and was unaware of the term pervasive computing but aware of its concept.

David thought that the system as a whole was fantastic and encouraged a new perspective to cooking and using the kitchen as a student. As the last interviewee, when he learned of suggestions of improvements by the other interviewees he agreed with all of them. He very much liked the idea of parties in the kitchen with interactive drinking games and music and the idea of a method to wash up kitchen utensils in less than 2 minutes. He agreed with George's reasoning that it would cost a lot more in electricity, but thought it would be worth paying for. He thought it was absolutely necessary to implement an option in which the user can manually operate the kitchen should they choose (Although he stated that he probably wouldn't).

David thought that the requirements solved the problems in a student kitchen as much as technology possibly could. His example was changing of the bins; technology can only go so far as to tell you when to empty them, it is down to human actions if they actually get taken out.