Acme Kitchen Company – *'Kitchen 2020'*

"The future kitchen is here"

Requirements Elicitation
MoSCoW Analysis
Data Flow Diagram
Requirements Verification
Requirements Validation

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1. INTRODUCTION

The following sections of the documentation outlines the methods used for elicitation of requirements, formulates a list of requirements taken from all stakeholders, prioritization of requirements, document the data flow diagrams for a new product – codenamed *'Kitchen 2020'* – as a single kitchen solution.

The requirements elicitation process will begin with the identification and analysis of key stakeholders. Once Identified the report demonstrates the techniques used to draw out the needs of the stakeholders in preparation for prioritization and scoping using the following:

- Brainstorming
- Surveys
- Documentation Analysis

The prioritization of requirements will discount stakeholder bias and examine each requirement in the context of solution delivery i.e. requirements will be categorised according to how much they satisfy the overarching business need. A MoSCoW analysis is employed to rank requirements elicited from stakeholders. The analysis will assign requirements to 4 categories of criticality.

- Must Have
- Should Have
- Could Have
- Won't Have

The data flow diagrams show the different data processors and the expected input and the output for each of the data processors.

2. PURPOSE

2.1. REQUIREMENTS ELICITATION

The requirements elicitation is made up of various types of events that are designed to identify the needs, wants or conditions of the identified stallholders when implementing a new series of Smart Kitchens with full data management for Kitchens. The request was received to gather, collate, store data using the Acme Cloud Services and analyse the data to improve kitchen management for interested parties. This process gathers requirements in relation business and technical requirements, consolidating these requirements into a comprehensive document, outlining the process in prioritizing these needs and wants. This comprehensive and cohesive document acts as a contractual agreement between all parties involved in the project. The requirements outlined are actionable, measurable and validated, in order to identify the needs or any opportunities for development or important.

2.2. REQUIREMENTS PRIORITIZATION

The purpose of the requirements prioritization is to

a) Rank the requirements in order of criticality to deliver the smart kitchen solution.
b) Determine the critical path to the project by ring-fencing 'must have' requirements.

2.3. DATA FLOW DIAGRAM

The DFD shows how data flows between the different entities, what processes interact with the data and where the data is stored.

3. ELICIT REQUIREMENTS

3.1. STAKEHOLDER IDENTIFICATION

The initial step in the process was to identify the key stallholders as a means to aid the Business Analysts in gaining information on the organisations, individuals or groups and understanding their needs, Interest and role with the request and therefor their importance to the success of the project. This will create the initial outline of the approach for the transformation process, specifically regarding to planning, communication and alignment of requirements.

Identified Stakeholders

No.	Stakeholder Name	Level of Importance	Techniques Identified
1.	Acme Kitchens	Very Important/High Influence	Requirements Workshops Document Analysis Interface Analysis (Flowchart) Prototyping
2.	Partners	Very Important/High Influence	Brain Storming
3.	Suppliers (Technology vendors, Cloud Services)	High Power/Low Influence	Brain Storming
4.	Users	Very Important/High Influence	Survey – Supermarket Consumers Survey Monkey (online shopping Incentives)
5.	Data Protection	Low Influence/Low Importance	Document Analysis

Table 1: List of techniques identified for identifying stakeholders.

3.1.1. REQUIREMENTS GATHERING TECHNIQUES

The following approach and techniques were carried out to elicit the requirements and gather data to assist in identifying all requirement in order to later prioritise the requirements into a consolidated list for action and validation. Methods included *brainstorming, documentation analysis, questionnaires and surveys* in attempt to draw out important answers to questions such as;

- "What is being done right now?"
- "Who is perceived to do it in the future?"
- ''Where is it done now?'

- "What does the current research and documentation in the area suggest?"

Requirements Gathering Approach

No.	Requirements Gathering Technique	Date	Participants	Facilitators
1.	Brainstorming	28/11/2015 & 21/11/2015	Acme Kitchens	Sandip Nambiar Tony O'Callaghan Gilles-Henri Noury John Ryan
2.	Survey/ Questionnaire	21/11/2015 to 26/11/2015	Partners	Sandip Nambiar Tony O'Callaghan Gilles-Henri Noury John Ryan
3.	Documentation Analysis	26/11/2015	Suppliers (Technology vendors, Cloud Services)	Sandip Nambiar Tony O'Callaghan Gilles-Henri Noury John Ryan

Table 2: List of requirements elicitation methods used, with dates, participants and facilitators.

3.1.2. BRAINSTORMING

3.1.2.1. LIST OF REQUIREMENTS

3.1.2.1.1. COMMERCIAL REQUIREMENTS FROM SUPPLIERS

Objective: Enter the Irish Market for the different consumer products.
Products
(a) Smart fridge for the Irish Market (sell)
(A.1) Intelligent
(A.2) LED Displays
(A.3) Volume (storage)
(b) Smart Washing Machine for Irish Market (sell)

- Energy efficient
- Water saving
- Compact
- Timer and auto Shutdown

(c) Smart Microwave for the Irish Market (sell);

- Energy efficient
- Intelligent.
- Dish Washers.

(d) Hobs;
Requirements:

1. Enter Irish Market.
2. One stop appliance solutions

3.1.2.1.2. COMMERCIAL REQUIREMENTS FROM SUPERMARKETS

Objective: Main objective of the supermarkets is to increase market share and sales online.

No.	Identified Requirements
1.	Integration with supermarket databases in real time information.
2.	Stock Control device in fridge
3.	Q-barcode that automatically scans each product in the fridge (best before product ID)
4.	LCD Screen to display offers
5.	Smart application on user's phone to settings (automatic orders etc.)
6.	Predictive Technology
7.	Complementary goods, Product recommendations Machine Learning.
8.	Temperature.
9.	Fridge Presses.
10.	Access to measure outside environment.
11.	Access to every smart device even if it's linked to other supermarket chains.
12.	Continuous data gathering - Access to consumer data including, food consumption, shopping habits, what products you purchase on a routine basis, methods of payments and social networking information.
13.	Smart application on user's phone to settings (automatic orders etc...)
14.	Predictive Technology.
15.	Complementary goods, Product recommendations Machine Learning.

Table 3: List of identified requirements.

3.1.3. DOCUMENTATION & RESEARCH ANALYSIS

Summary of Documentation & Research Analysis Results - Additional Supermarket Requirements for Consideration.

Description; what is being done in currently by supermarkets such as TESCO and their perceived future activities.

1. Mobile app development for smart phone users, allowing customers to stay connected and committed to the supermarket chain, recommend nearest location and recommend customers to products based on buying habits and access to data from the smart kitchen devices.

2. Information and technology to provide daily dietary information to track calories consumption versus expenditure per hour. Offer recipes based on store products using a

smart device applications. These applications allow monitoring off food ingredients, time and frequency of important meals such as breakfast, lunch and dinner.

3. Loyalty card registration along with new communication channels to enhance customer engagement and offer promotions, competitions, surveys and questionnaires.

4. Customer Engagement Management Systems which provides real-time tracking and monitoring, and customer diagnostics.

5. ERP System- enterprise resource planning software, which automatically runs business process tasks from supply, storage (stocking products in time), and food consumption to wastage. Data analytics can be performed on customer data that is used to identify patterns of behavior and gather feedback. An ERP System will provide the supermarket chain with a metrics on what products are being sold must often and introduce loyalty programs to increase productivity.

3.1.3.1. LIST OF REQUIREMENTS

3.1.3.1.1. CONSUMER REQUIREMENTS

Smart Kitchen National Consumer Benefits:

- Health count calories.
- Times & money savings.
- Recipe Learning.

Identified Constraint: How can I allocate all the resources in my kitchen for a meal now.

- Lifecycle; Supply → Store (stock in time) →Cook → Waste/Recycle.
- Smart phone on demand or push.
- Easy cooking.
- Coffee ready to go when I wake up.
- I don't want a logical computerized.
- Needs to be less invasive as possible.
- Additive aware (chemical, colors).
- Fat content
- Salt Content.

3.1.4. SURVEY

Consumer Requirements for Consideration

1. Would you consider the use of a smart kitchen appliance such as a fridge or storage unit with a central monitoring system with calendar display discourages impulse purchases and food wastage when shopping due to the ability to view real time status of current stock levels?

   Response out of 9 participants;

   a) **Strongly agree; 3**
   b) **Agree; 4**
   c) Neutral; 1
   d) Disagree; 1

2. WIFI enabled smart devices to order products online post expiry based on past purchases and loyalty card data

   Response out of 9 participants;

   a) Strongly agree; 0
   b) **Agree; 7**
   c) Neutral; 1
   d) Disagree; 0

3. Fridge or storage unit with a central monitoring system with calendar display.

   Response out of 9 participants;

   a) **Strongly agree; 2**
   b) **Agree; 3**
   c) Neutral; 1
   d) Disagree; 2
   1 skipped

4. Discourages impulse purchases and food wastage when shopping.

   Response out of 9 participants;

   a) **Strongly agree; 2**
   b) **Agree; 3**
   c) Neutral; 1
   d) Disagree; 2
   1 skipped

5. Ability to view real time status of current stock levels.

   Response out of 9 participants;

a) **Strongly agree; 2**
b) **Agree; 3**
c) Neutral; 1
d) Disagree; 2
1 skipped

6. Machine Learning - Intelligent learning systems that monitors user habits and preferences

   Response out of 9 participants;

   a) Strongly agree; 0
   b) **Agree; 5**
   c) **Neutral; 2**
   d) Disagree; 0
   e) Strongly disagree; 1
   1 skipped

7. Voice based communication systems that provide updates and alerts.

   Response out of 9 participants;

   a) Strongly agree; 0
   b) **Agree; 7**
   c) Neutral; 0
   d) Disagree; 1
   e) Strongly disagree; 0
   1 skipped

8. Kitchen appliance contributing to energy savings by automatically operating during periods of low off peak energy time periods.

   Response out of 9 participants;

   a) **Strongly agree; 1**
   b) **Agree; 6**
   c) **Neutral; 1**
   d) Disagree; 0
   e) Strongly disagree; 0
   1 skipped

9. A smart kitchen appliance that is connected and controlled through a PC, smart phone or other intelligent device.

   Response out of 9 participants;

   a) **Strongly agree; 1**
   b) **Agree; 6**
   c) **Neutral; 1**
   d) Disagree; 0
   e) Strongly disagree; 0
   1 skipped

10. Would a smart kitchen appliance greatly increase the management and efficiency within the home smart kitchen appliance that organizes your menu for the upcoming days?

Response out of 9 participants;

a) **Strongly agree; 3**
b) **Agree; 4**
c) **Neutral; 1**
d) Disagree; 0
e) Strongly disagree; 0
1 skipped

11. Meal planning recommendation applications to reducing food wastage.

Response out of 9 participants;

a) **Strongly agree; 3**
b) **Agree; 4**
c) **Neutral; 1**
d) Disagree; 0
e) Strongly disagree; 0
1 skipped

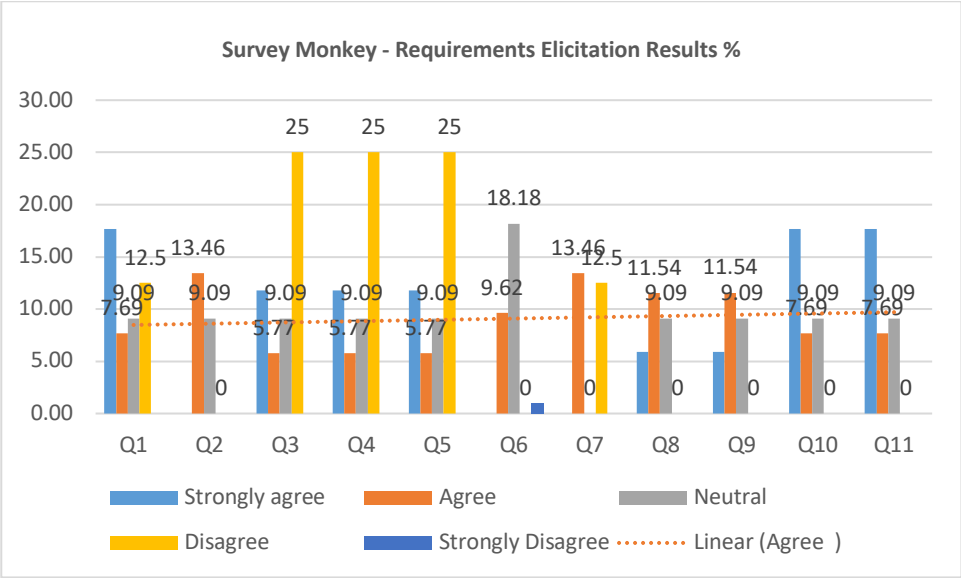
Additional Survey Question;

12. What changes would most improve in your Kitchen;

- No food wastage
- Day to day reminder of food expiry date.
- Connecting appliances with P.C and smart phone.
- A dashboard for you to monitor your meal time and how long it is going to cook meals.

Summary of Results

Below graph represents the results expressed as a percentage of the consumer responses to each question asked in the survey. The line of best fit indicates that most respondents strongly agree (Blue) with the questions asked. Many individual questions asked held identified more than one requirement and this was broken out below and indicated in the results.



Graph 1: Results of answers to the survey as a percentage.

Table of Results – Total number of responses

	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
Q1	3	4	1	1	0
Q2	0	7	1	0	0
Q3	2	3	1	2	0
Q4	2	3	1	2	0
Q5	2	3	1	2	0
Q6	0	5	2	0	1
Q7	0	7	0	1	0
Q8	1	6	1	0	0
Q9	1	6	1	0	0
Q10	3	4	1	0	0
Q11	3	4	1	0	0

Table 4: Survey results

4. MoSCoW Analysis

4.1. Requirements Prioritization

The MoSCoW analysis ranks requirements on the importance stakeholders place on the delivery of each requirement.

- The 'Must Have' requirements specify the minimum usable subset of requirements. They are critical requirements that will deliver the smart kitchen solution. Omission of any 'Must Have' requirements will mean the solution cannot be delivered on target.
- The 'Should Have' requirements are important to delivering the solution, but not critical. Omission of these requirements may deliver a substandard smart kitchen solution.
- The 'Could Have' requirements are less important. They will add minimal value to the final solution but may deemed as nice perks to key stakeholders.
- The 'Won't Have' requirements fall outside the scope of the original brief for this project.

4.1.1. Consumer requirements Prioritization

The following requirements have been elicited from consumer group organisations and end users.

Stakeholder	Requirements	Prioritization
Consumer	Smart phone on demand or push	M
	Adding, updating or deleting items on a grocery list	M
	Adding, updating or deleting reminders	M
	Adding, updating or deleting loyalty card information	M
	Ability to delete data held by ACME and partner organizations	M
	Stock control smart application (real time stock – sale by date)	M
	Self-preparing coffee	C
	Additive aware system (chemical, colors)	C
	Must come at cheap price	S
	Cooking lessons on LCD Screen, with advertisement.	S
	Recipe suggestion based on diet, allergies, health, culture etc…	S
	Meal suggestions based on available ingredients	S
	Fat content indicator - Salt Content indicator – Calorie counter	S
	Machine learning consumer habit (Must have on me opinion)	S
	Supply – store (stock in time) – Cook – bin	W
	Easy cooking	W

Table 5: Consumer requirement prioritized.

- Shopping list based on customer taste, discount and available products in the kitchen, it allows the consumer to know what to choose instead of wondering what to buy.
- Direct order sent to supermarket for home delivery via smartphone as an option. For those who hate shopping for groceries and rather spend time with their family.
- Price of the kitchen must be cheap (maybe partly financed by advertising, groceries stores, allowing use of consumer data), this was a 100% consumer requirement.
- Recipes available considering the food stock and other customer constraints, coming as a video on LCD screen. Fun and learning part as well.

The smart phone application is deemed as a critical requirement for this project. The application will work as the GUI for the end user and will enable the user to manage their smart kitchen remotely. The grocery list, reminders and loyalty card requirements are deemed critical as this will allow the user to communicate with ACME's supermarket partners and fulfil the basic needs of the user.

Health benefits are deemed as 'Should Have' requirements as consumers have expressed a strong preference for utilizing the smart kitchen as a way to promote and manage their health. While not a critical requirement for delivering the solution. End user demand will be affected by offering these features to consumers.

Features such as cooking lessons, recipe suggestions and smart solutions for meal preparation are deemed as 'Should Have' requirements as consumers have ranked these requirements as being high in importance. They also offer supermarkets the opportunity to promote products (ingredients) and are deemed as value add factors for a SMART kitchen solution.

The 'Won't Have' requirements could not be defined accurately and are deemed to be outside the scope of the Smart kitchen solution.

4.1.2. SUPPLIER REQUIREMENTS CATEGORIZATION

The following requirements have been elicited from ACME kitchen solutions and from brainstorming with other potential suppliers in the Irish market.

Stakeholder	Requirements	Prioritization
Supplier	Smart fridge for the Irish Market (sell) • Intelligent • LED Displays • Volume (storage)	M
	Smart Washing Machine for Irish Market (sell) • · energy efficient • · Water saving • · Timer and auto Shutdown	M
	Smart Microwave for the Irish Market (sell);	M

	• · energy efficient • · Intelligent. Smart Dishwasher	
	Cloud storage for grocery list, customer data, loyalty card data.	M
	Smart bin to monitor waste	M
	Hobs	S
	Shopping List generator	S

Table 6: Supplier requirement prioritized.

The requirements elicited from suppliers can be split into two broad categories.

Hardware requirements:
The hardware requirements stated by ACME kitchens are deemed as 'Must Have' requirements for the delivery of the SMART kitchen solution. The SMART fridge specifications endorse a minimum size requirement as the product is aimed at families living in Ireland. Another crucial benefit of having a large fridge is that more stock can be promoted by supermarkets and greater data learning potential. The provision of an LED screen will enable the user the interact with the fridge, receive cooking lessons, display recipes and allow partner supermarkets to advertise.

The washing machine, dishwasher and microwave hardware requirements are deemed critical as they will allow for users to monitor energy usage, manage their kitchen remotely (e.g. turn on the dishwasher remotely) and contain new and advanced safety features such as auto shutdown and timers. They will also allow for the kitchen to send push notifications to end users SMART application to alert them of dangerous activity in the kitchen.

Software requirements:
The main software requirement is secure cloud storage. The typical SMART kitchen is estimated to generate 5000 terabytes of data each year. Cloud storage allows for seamless capacity upgrades if needed. Cloud solutions also satisfy the requirements of the Office of the Data Protection Commissioner. This requirement is therefore deemed critical and as such has been categorized as a 'Must Have'.

The shopping list generator was specified by consumers in the section 3.1.1 and is deemed as an important requirement. While not critical to the success of the solution it will be a valuable feature to all key stakeholders.

4.1.3. PARTNER REQUIREMENTS PRIORITIZATION

The following requirements have been elicited from ACME kitchen solutions and from brainstorming with other potential suppliers in the Irish market.

Stakeholder	Requirements	Prioritization
Partner	Integration with supermarket databases in real time information.	M

	Stock Control device in fridge	M
	Q-barcode that automatically scans each product in the fridge (best before product ID)	M
	LCD Screen to display offers	M
	Smart application on user's phone to settings (automatic orders etc...)	M
	Predictive Technology Solution	S
	Complementary goods, Product recommendations Machine Learning.	S
	Access to temperature settings	C
	Access to measure outside environment.	C
	Continuous data gathering - Access to consumer data including, food consumption, shopping habits, what products you purchase on a routine basis, methods of payments and social networking information.	C
	Q barcode scanner in presses	W
	Access to other partner Supermarkets databases	W

Table 7: Partner requirement prioritized.

The supermarket industry will be a key driver in delivering the SMART kitchen solution and are fully engaged with the process.

During elicitation the above requirements were deemed critical by supermarket representatives. Once analyzed in the context of delivering an overall solution the Business Analyst team were above to prioritize requirements in the overall context of the solution.

Full integration between SMART kitchen databases and supermarket databases was deemed critical. The requirement will allow for real time exchange of information. In a practical sense this will enable the other key requirements of the solution i.e. allowing for stock control, automatic ordering of goods from supermarkets, supermarket promotions based on users preferences etc. The supermarket industry see benefit in having a stock control device in the fridge. It is already deemed a 'Must Have' requirement and will enable automatic purchase orders between users and supermarkets. The other 'Must Have' requirements have already been explained above.

Both a predictive technology solution and a machine learning solution for complementary meal selections are not critical to providing the SMART solution. However, the supermarket industry has expressed a keen interest in these features. The proposed features will enable supermarkets to offer discounts ahead of time, manage stock and promote new products to users.

Access to external information such as weather, outside temperature and features that measure the external environment are deemed as a potential 'Could Have' requirement. The feature would allow supermarkets to advertise different products depending on weather, noise level, pollution level etc. Having the SMART kitchen measure external factors may breach

data laws. This requirement will be considered and followed up in conjunction with the Office of the Data Protection Commissioner.

Tesco supermarket forwarded a requirement to fit Q barcode scanners in presses and other storage elements in the SMART kitchen. The benefits of this would be to monitor all goods users purchase. However, this requirement is not necessary as the SMART bin solution will meet these objectives and allow access to consumed products that enter the SMART bin.
Access to other supermarkets databases would enable supermarkets to monitor purchase behavior in other shops and in turn provide a wider range of goods to the user and increase their market share. This requirement was deemed outside the scope of this solution.

5. DATA FLOW DIAGRAM (DFD)

The data flow diagram (DFD) mentioned in this report is for the software solution installed as part of *'Kitchen 2020'*.

The software solution includes the following.

a. An interactive application that allows the customers to handle grocery lists, shopping reminders and loyalty cards.
b. A sales application that allows the supermarkets to display offers, specials and promotions to their loyalty customers.

The customer data and accepted offers / specials / promotions data is only stored in a cloud solution developed by Acme Kitchen Company.

5.1. ELEMENTS

5.1.1. EXTERNAL ENTITIES

The following external entities have been identified as the 'source' of data for this requirement.

No.	Source of data	Description
1	Customer	The customer is allowed to a. View, Add, Update or Delete grocery lists b. View, Add, Update or Delete shopping reminders c. View, Add, Update or Delete loyalty card information d. View nutritional information The customer is also allowed to a. Send grocery list to supermarket
2	Supermarket	The supermarket could a. Send offers, specials or promotions
3	Acme Kitchen Company	The company would a. Send meal or recipe suggestions b. Send item stock information

Table 8: List of source entities.

The following external entities have been identified as the 'destination' of data for this requirement.

No.	Destination of data	Description
1	Cloud	The cloud would store data with regards to any of the following functions a. Grocery lists b. Shopping Reminders c. Loyalty card information d. Accepted offers, specials and promotions
2	Supermarket	The supermarket would a. Receive the grocery list

Table 9: List of destination entities.

5.1.2. DATA STORE

The following data store has been identified for this requirement.

No.	Data Store	Description
1	Cloud	The cloud that stores all the data handled by *'Kitchen 2020'*.

Table 10: List of data stores.

5.1.3. DATA PROCESS

The following data processes has been identified for this requirement.

No.	Data Process	Description
1	Grocery list processing	The processing unit would handle the following information a. Viewing, Adding, updating or deleting items on a grocery list b. Sending grocery list to supermarket
2	Shopping Reminder processing	The processing unit would handle the following information a. Viewing, Adding, updating or deleting shopping reminders
3	Loyalty card processing	The processing unit would handle the following information a. Viewing, Adding, updating or deleting items loyalty card information
4	Item Nutritional processing	The processing unit would handle the following information a. Viewing the item nutrition information
5	Offers, Specials and Promotions	The processing unit would handle the following information 1. Sending offers, specials and promotions to the customers

Table 11: List of data processes.

5.1.4. DATA FLOW

The data flow for this requirement using the Yourdon Notation. The data flow has been split based on the data processes involved.

5.1.4.1. GROCERY LIST PROCESSING

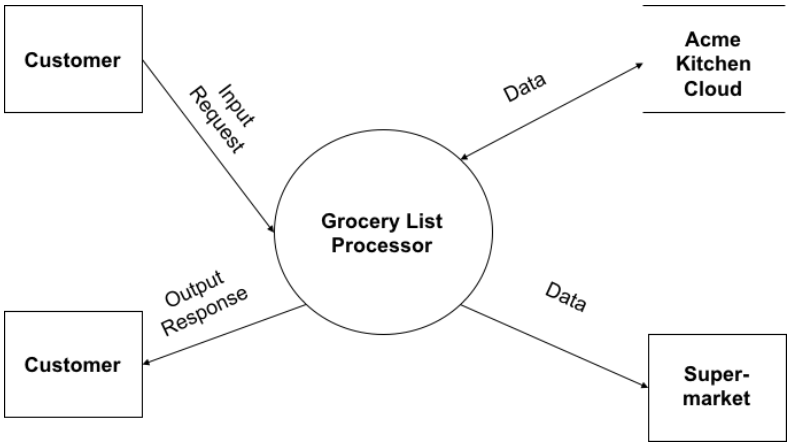


Diagram 1: Grocery List Processor.

Customer

The following users of the application

- Main Shopper who can view, add, update or delete items on a grocery list(s).
- Main Shopper who can send the grocery list to the supermarket.
- Alternate Shopper who can only view and add items on a grocery list(s).

Cloud

The virtual storage that holds the grocery list and related information.

Input Request

The different input requests accepted

- View items on a grocery list.
- Add items to a grocery list(s).
- Update items on a grocery list.
- Delete items from a grocery list(s).
- Send grocery list to supermarket.

Output Response

The different output responses

- Grocery List (View request only)
- Acknowledgment of request.

Data

- The original grocery list and every amendment on the grocery list are stored in the cloud.
- The grocery list is sent to the supermarket.

Processor

The processor would action the different input requests and generate responses as appropriate. The processor always waits for a user input.

Assumption

The following assumptions were made.

- There can only be one main shopper.
- The main shopper has to add a grocery list for the family.

Constraints

The following constraints were identified.

- Each grocery list is limited to a maximum of 50 individual items.
- Each grocery list is limited to a single supermarket.

5.1.4.2. SHOPPING REMINDERS PROCESSING

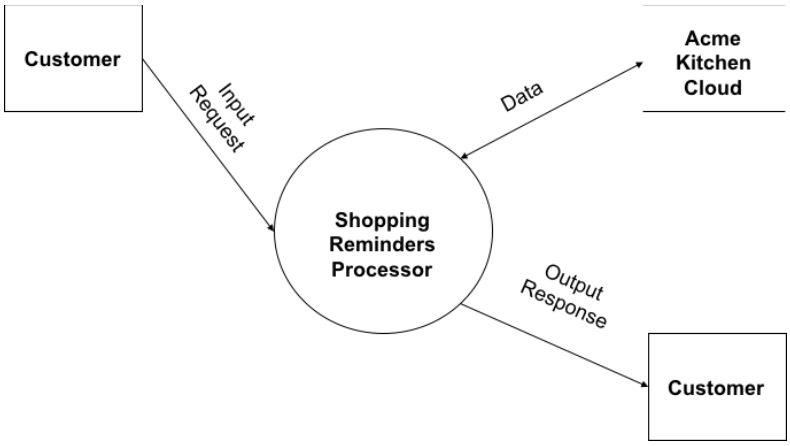


Diagram 2: Shopping Reminders Processor.

Customer
The following users of the application
- Main Shopper who has the authority to view, add, update or delete shopping reminders.
- Alternate Shopper who only has the authority to view shopping reminders.

Cloud
The virtual storage that holds the shopping reminders information.

Input Request
The different input requests accepted.
- View shopping reminders set for the day, week or month.
- Add shopping reminders on when the next shopping must be done.
- Update shopping reminders to update the date of next shopping.
- Delete shopping reminders.

Output Response
The different output responses.
- Shopping Reminders (For View request only).
- Acknowledgment of request.

Data
- The shopping reminders and every amendment on the shopping reminders are stored in the cloud.

Processor
The processor would action the different input requests and generate responses as appropriate. The processor always waits for a user input.

Assumption
The following assumptions were made
- The main shopper only has the authority to view, add, update or delete reminders.

Constraints
The following constraints were identified
- Shopping reminders can be added to a maximum of 2 months from current date.
- Shopping reminders can be added to a minimum of 1 day from current date.

5.1.4.3. LOYALTY CARD PROCESSING

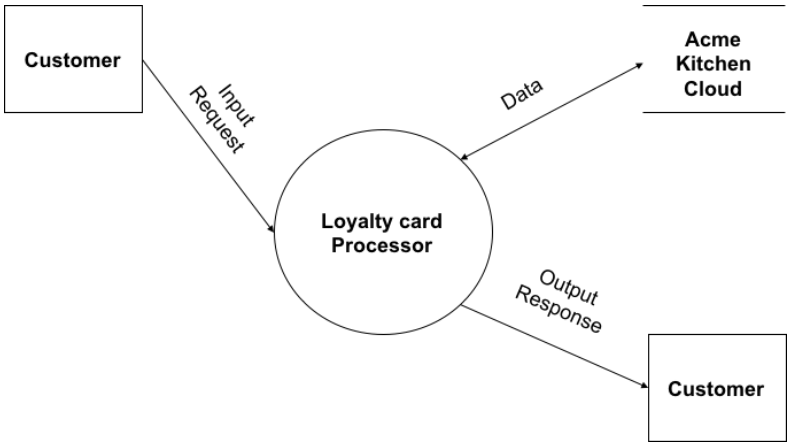


Diagram 3: Loyalty card Processor.

Customer
The following users of the application
- Main Shopper who has the authority to view, add, update or delete loyalty card(s).
- Alternate Shopper who only has the authority to view the loyalty card(s).

Cloud
The virtual storage that holds the loyalty card information.

Input Request
The different input requests accepted.
- View loyalty card.
- Add loyalty card(s).
- Update loyalty card.
- Delete loyalty card(s).

Output Response
The different output responses.
- Loyalty card (for View request only).
- Acknowledgment of request.

Data

- The loyalty card and related information are stored in the cloud.

Processor

The processor would action the different input requests and generate responses as appropriate. The processor always waits for a user input.

Assumption

The following assumptions were made

- The main shopper only has the authority to view, add, update or delete loyalty card.

Constraints

The following constraints were identified

- A maximum of 2 loyalty cards can be added per supermarket.
- The system only allows to add loyalty cards for Tesco, SuperValu and Dunnes Stores.

5.1.4.4. ITEM NUTRITIONAL PROCESSING

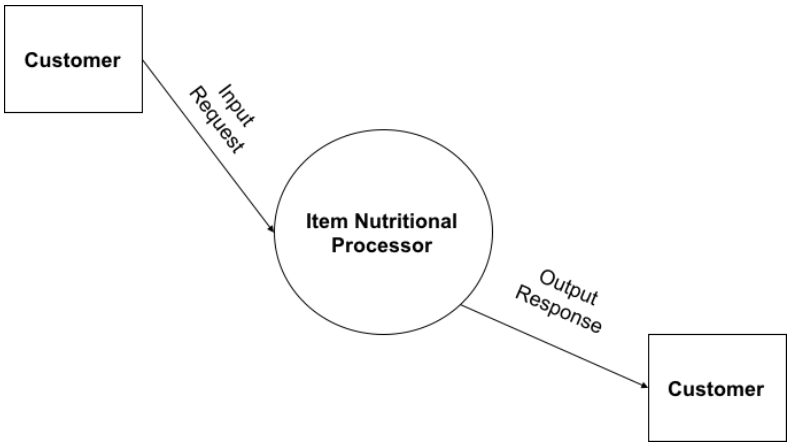


Diagram 4: Item Nutritional Processor.

Customer

The following users of the application

- Everyone has access to view the item nutritional information.

Input Request

The different input requests accepted.

- View item nutritional information.

Output Response

The different output responses.

- Item nutritional information.

Processor
The processor would accept the item name, scan the nutritional information on the item package and send this information back to the customer. The processor always waits for a user input.

Constraints
The following constraints were identified
- The in-built scanner can only read the item nutritional information printed on the package.

5.1.4.5. OFFERS, SPECIALS AND PROMOTIONS PROCESSING

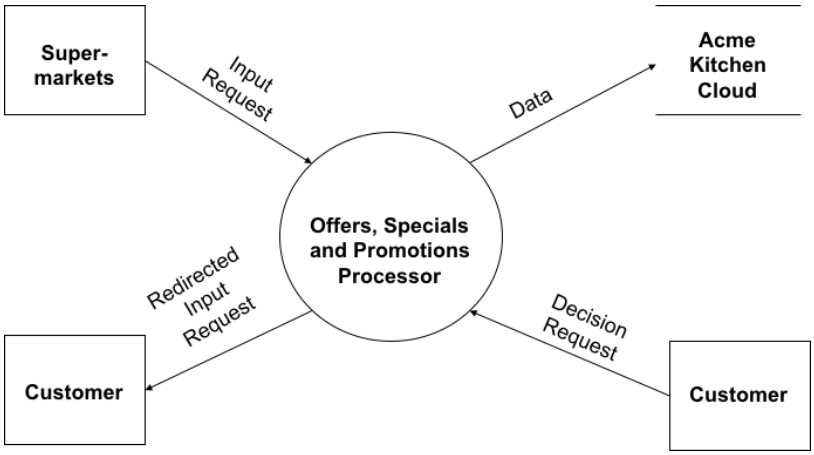


Diagram 5: Offers, Specials and Promotions Processor.

Customer
The following users of the application
- Main Shopper who has the authority to view or accept the offers, specials and promotions.
- Alternate Shopper who has the authority to only view the offers, specials and promotions.

Cloud
The virtual storage that holds the accepted offers, specials and promotions information.

Input Request
The different input requests accepted.
- View offers, specials or promotions.
- Accepted offers, specials or promotions.

Decision Request
The different decision requests.
- Accept offers, specials or promotions added to grocery list.

- Reject offers, specials or promotions.

Data

- Accepted offers, specials or promotions are stored in the cloud.

Processor

The processor would receive the offers, specials or promotions from the supermarket and display the same to the customer. The customer can either accept or reject the same. The accepted details are stored in the cloud.

Assumption

The following assumptions were made

- The main shopper only has the authority to accept offers, specials and/or promotions.

5.1.4.6. MEAL / RECIPE PROCESSING

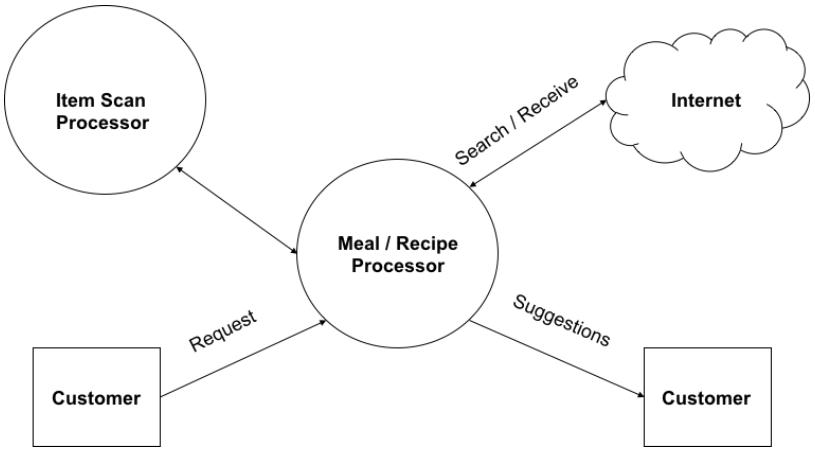


Diagram 6: Meal / Recipe Processor.

Customer

The following users of the application

- Anyone can request for a meal or recipe suggestion.

Cloud

The meal or recipe suggestion is searched from the internet.

Input Request

The different input requests accepted.

- Meal suggestion.
- Recipe suggestion.

Data

- Meal or Recipe suggestion from the internet.

Processor
The meal / recipe processor receives the request from the user. It would initiate an item scan to understand what items are available in the kitchen. Based on the item list, it would search the internet and send the suggestion to the user.

Constraints
The following constraints were identified
- The meal or recipe suggestion is as found on the internet.

5.1.4.7. ITEM STOCK PROCESSING

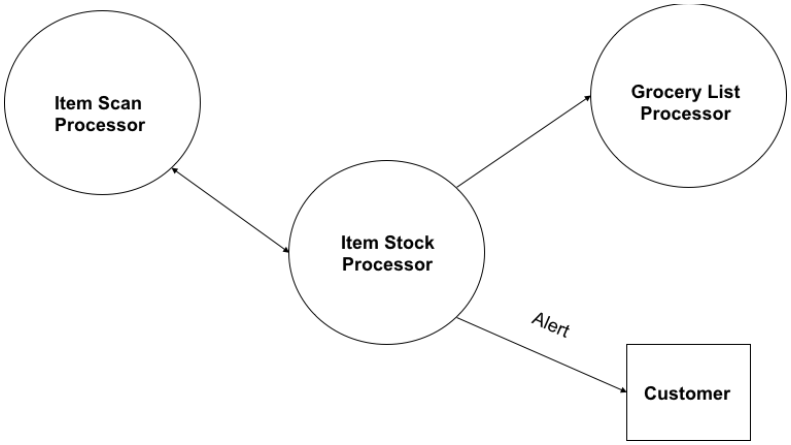


Diagram 7: Item Stock Processor.

Data
- Alert to the customer.

Processor
The item stock processor would initiate an item scan to understand what items are available in the kitchen at a pre-set interval. Based on the buying habits, it would alert the customer that an item is running low. The customer is given the option to add the item to a grocery list.

6. REQUIREMENTS VERIFICATION

6.1. FIRST LEVEL VERIFICATION

The first level requirement verification will be conducted by the Senior Business Analyst, Mr. Joe Bloggs, who is part of the project team. The reviewer would review the requirements captured and prioritised; and data flow diagrams.

The reviewer would email the project team with
a. any review comments, or,
b. confirmation that the information captured is true.

If there are any review comments, the project team would make changes as appropriate and send the document for review again. Document version control would be used.

Once the first level verification is complete, the document is circulated to the suppliers.

6.2. SECOND LEVEL VERIFICATION

The second level requirement verification will be conducted by a representative from the supplier and partner. The reviewer would review the requirements captured and prioritised; and data flow diagrams.

The reviewer would email the project team with
a. any review comments, or,
b. confirmation that the information captured is true.

If there are any minor review comments, the project team would make changes as appropriate and send the document for review again. Document version control would be used.
If there are any major review comments, the project tam would meet with the supplier and/or partner again and discuss. The details would be captured and the requirements document amended.

A first level verification is done again before the document is shipped to the supplier and/or partner again.

Once the second level verification is complete, the document is circulated to the sponsor delegate for final verification.

6.3. FINAL LEVEL VERIFICATION

The final level requirement verification will be conducted by the sponsor delegate.

The reviewer would email the project team with

a. confirmation that the information captured is true.

Once the final level verification is complete, the document is circulated to the sponsor delegate for final verification.

7. REQUIREMENTS VALIDATION

The requirement validation will be conducted by all the stakeholders.

The stakeholders will review the document to ensure all requirements are true.

The project team expects all stakeholders to send an email confirming that requirements are validated from their perspective.

The project team would answer any questions at this stage.

Any changes at this stage will be added into a requirements backlog and will picked up as a change request.

8. PROJECT TEAM

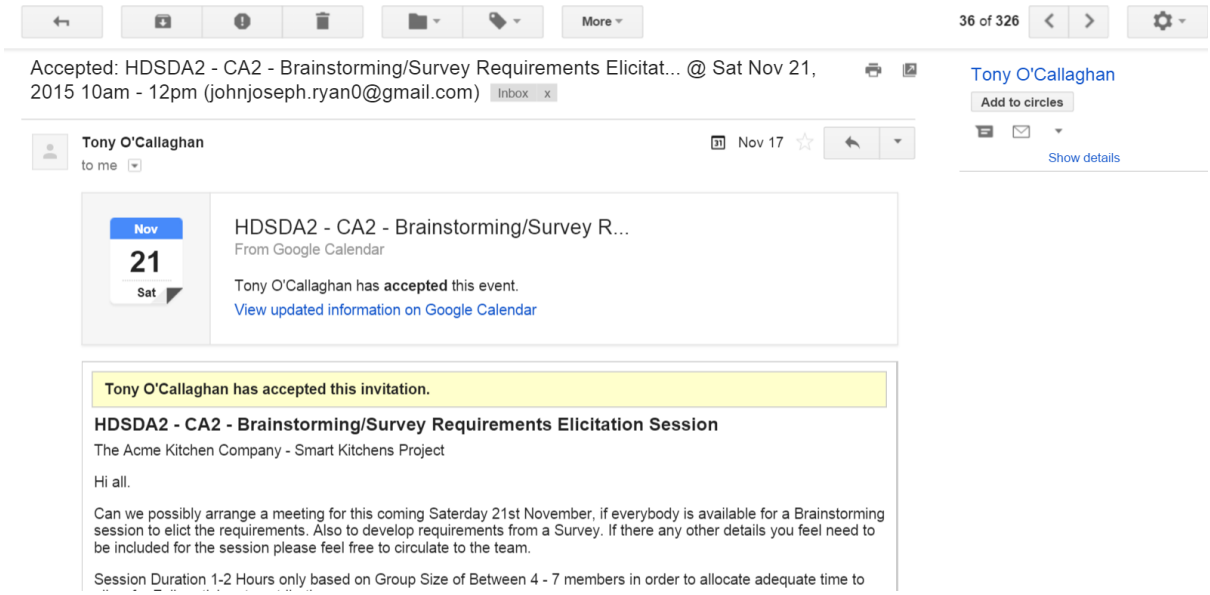
Business Analyst: Mr. Anthony O'Callaghan
Business Analyst: Mr. Gilles-Henri Noury
Business Analyst: Mr. John Joseph Ryan
Business Analyst: Mr. Sandip S. Nambiar

9. REFERENCES

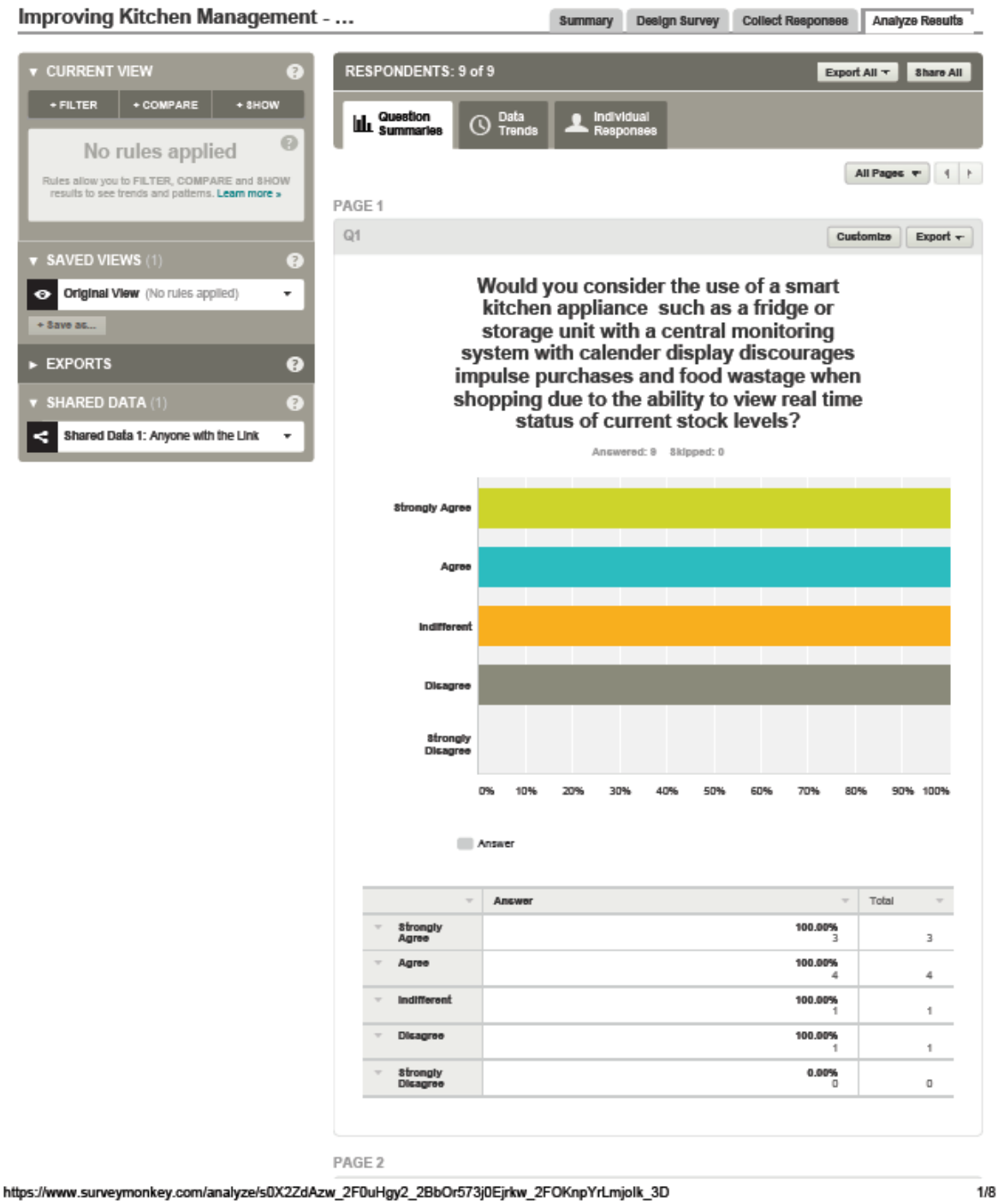
International Institute of Business Analysis (IIBA) (2009) *A Guide to the Business Analysis Body of Knowledge (BABOK Guide), Version 2.0*. [internet] Books24x7, available from: <http://common.books24x7.com/toc.aspx?bookid=42496> [accessed 2 December 2015]

10. APPENDIX

10.1. BRAIN STORMING SESSION MEETING INVITATION



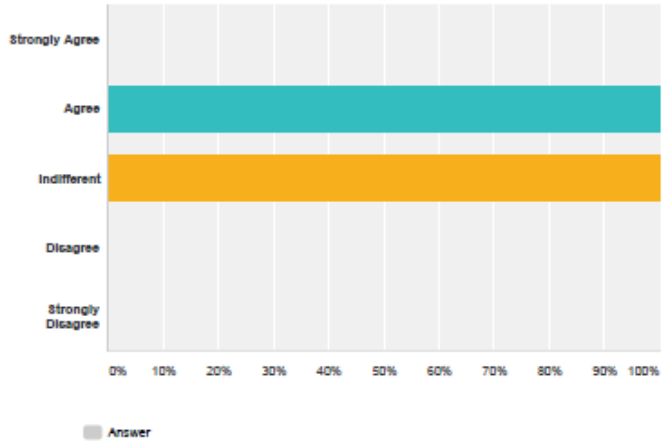
10.2. SURVEY RESULTS



Q2 Customize Export

Would you allow a WIFI enabled smart devices to order products online post expiry based on past purchases and loyalty card data?

Answered: 8 Skipped: 1



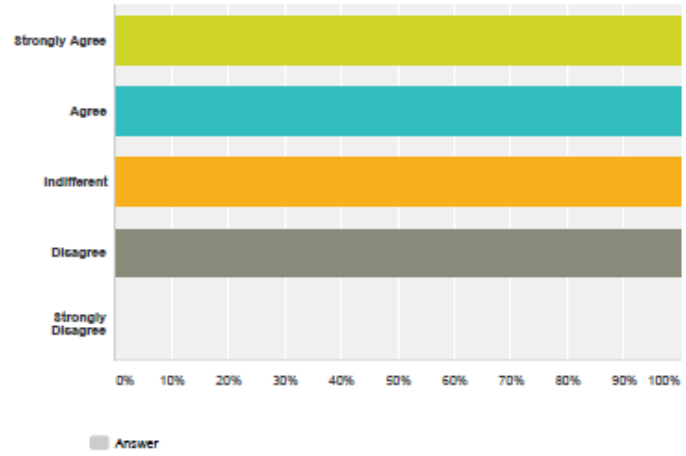
	Answer	Total
Strongly Agree	0.00% 0	0
Agree	100.00% 7	7
Indifferent	100.00% 1	1
Disagree	0.00% 0	0
Strongly Disagree	0.00% 0	0

PAGE 3

Q3 Customize Export

Do you feel the use of such a smart kitchen appliances for example a fridge or storage unit with a central monitoring system with calender display discourages impulse purchases and food wastage when shopping due to the ability to view real time status of current stock levels?

Answered: 8 Skipped: 1



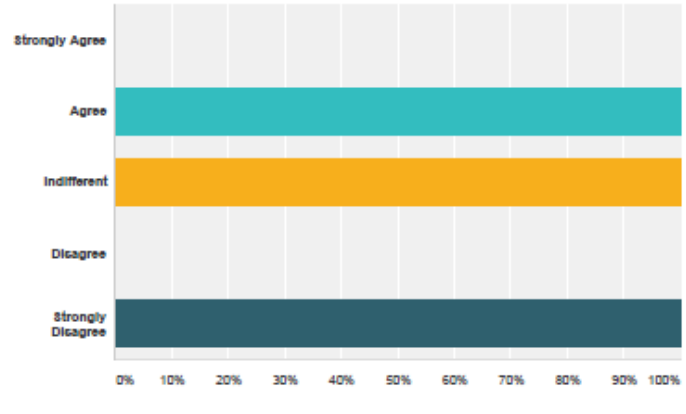
	Answer	Total
Strongly Agree	100.00% 2	2
Agree	100.00% 3	3
Indifferent	100.00% 1	1
Disagree	100.00% 2	2
Strongly Disagree	0.00% 0	0

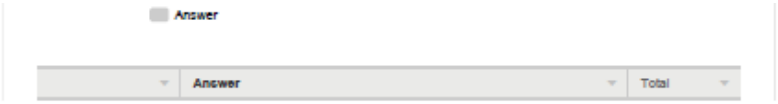
PAGE 4

Q4 Customize Export

Would you be comfortable with Intelligent learning systems that monitors user habits and preferences?

Answered: 8 Skipped: 1





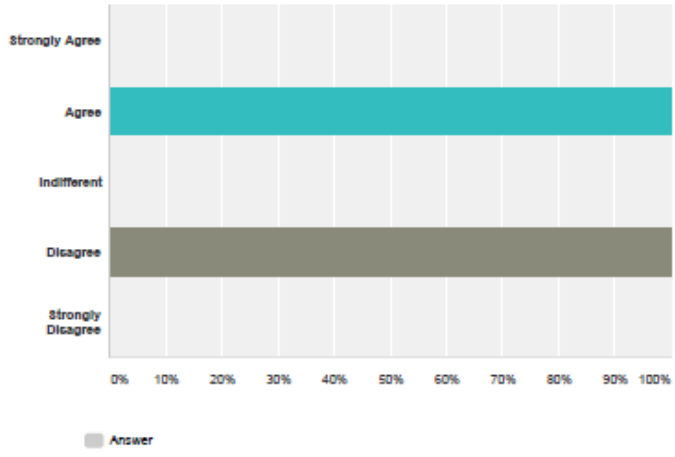
Strongly Agree	0.00% 0	0
Agree	100.00% 5	5
Indifferent	100.00% 2	2
Disagree	0.00% 0	0
Strongly Disagree	100.00% 1	1

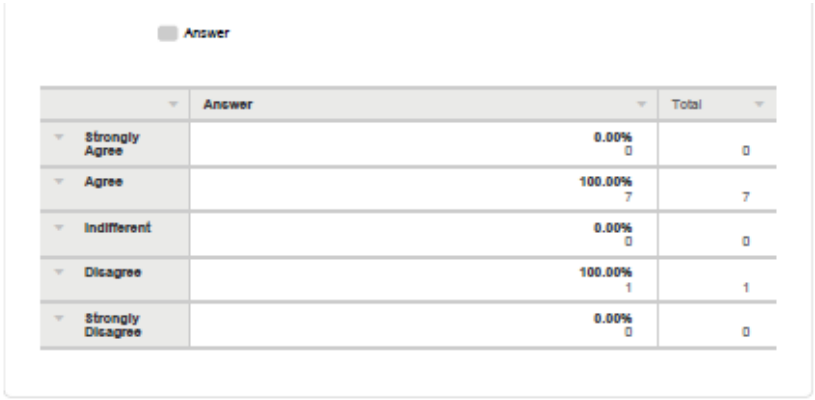
PAGE 5

Q5 Customize Export

What is your feelings towards a voice based communication system that provides updates and alerts?

Answered: 8 Skipped: 1



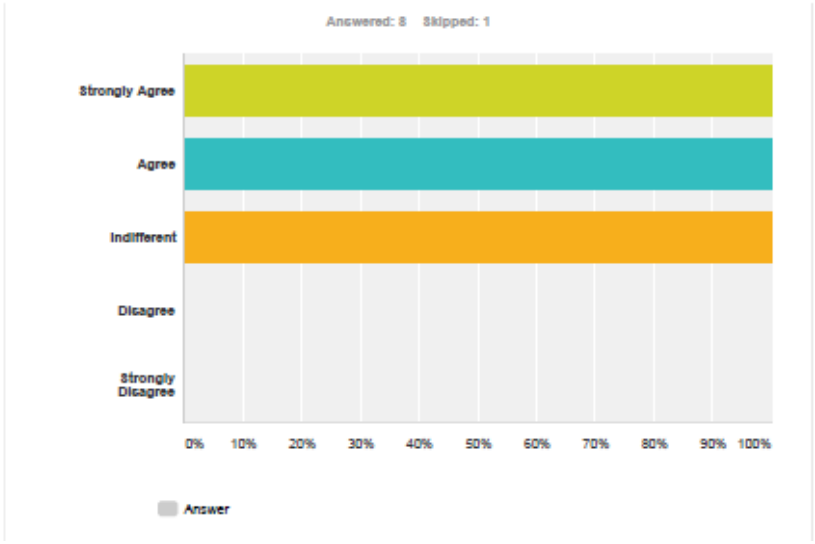


	Answer	Total
Strongly Agree	0.00% 0	0
Agree	100.00% 7	7
Indifferent	0.00% 0	0
Disagree	100.00% 1	1
Strongly Disagree	0.00% 0	0

PAGE 6

Q6 Customize Export

How would a Kitchen appliance such as a washing machine and dryer contribute energy savings by automatically operate during periods of low off peak energy usage?



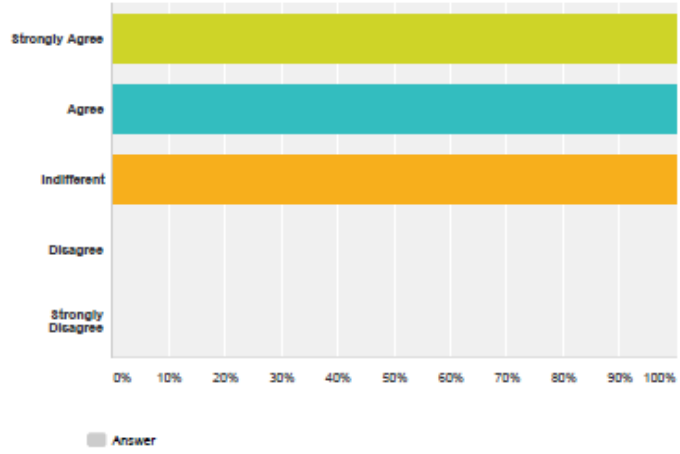
	Answer	Total
Strongly Agree	100.00% 1	1
Agree	100.00% 6	6
Indifferent	100.00% 1	1
Disagree	0.00% 0	0
Strongly Disagree	0.00% 0	0

PAGE 7

Q7 Customize Export

Would you consider buying a smart kitchen appliance that is connected and controlled through a PC, smart phone or other intelligent device?

Answered: 8 Skipped: 1



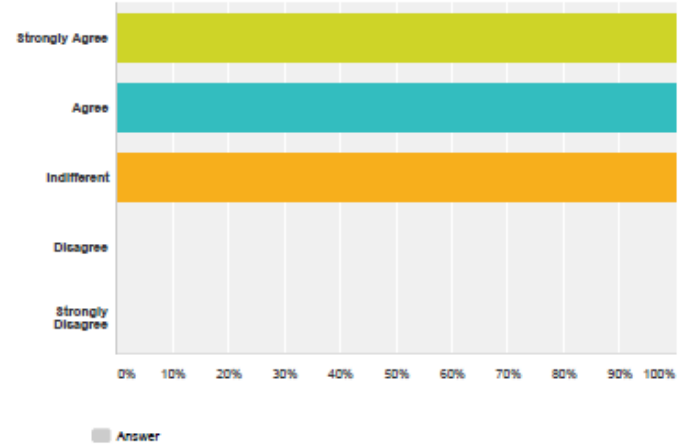
	Answer	Total
Strongly Agree	100.00% 3	3
Agree	100.00% 4	4
Indifferent	100.00% 1	1
Disagree	0.00% 0	0
Strongly Disagree	0.00% 0	0

PAGE 8

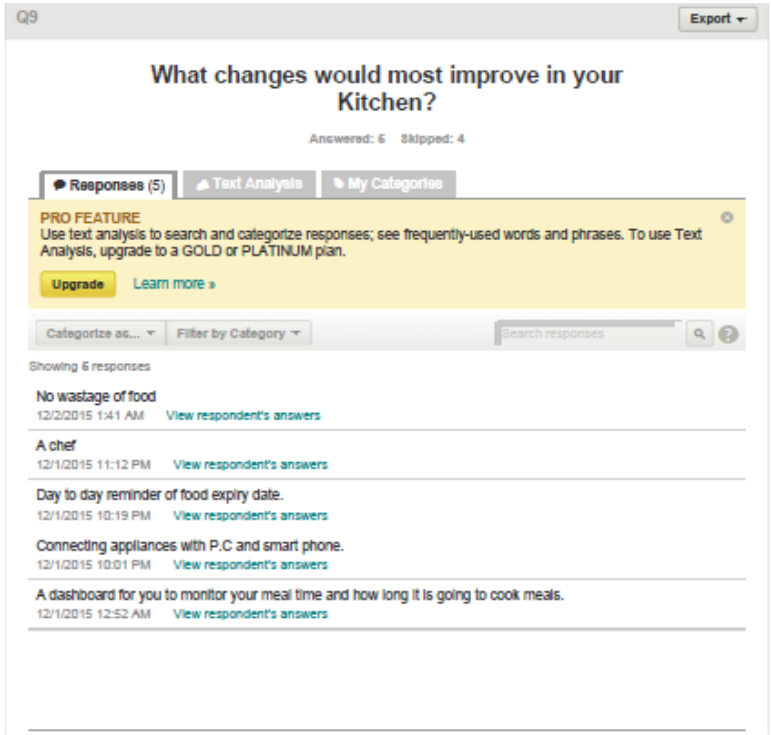
Q8 Customize Export

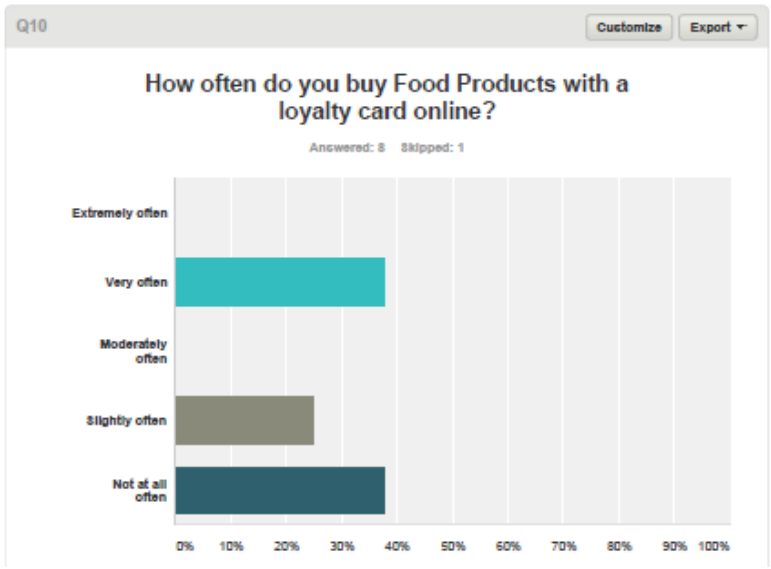
Would a smart kitchen appliance greatly increase the management and efficiency within the home by organising your menu for the upcoming days, such as meal planning recommendation applications, thus reducing food waste?

Answered: 8 Skipped: 1



	Answer	Total
Strongly Agree	100.00% 3	3
Agree	100.00% 4	4
Indifferent	100.00% 1	1
Disagree	0.00% 0	0
Strongly Disagree	0.00% 0	0


Q9
Export
What changes would most improve in your Kitchen?
Answered: 5 Skipped: 4
Responses (5)
Text Analysis
My Categories
PRO FEATURE
Use text analysis to search and categorize responses; see frequently-used words and phrases. To use Text Analysis, upgrade to a GOLD or PLATINUM plan.
Upgrade
Learn more »
Categorize as...
Filter by Category
Search responses
Showing 5 responses
No wastage of food
12/2/2015 1:41 AM View respondent's answers
A chef
12/1/2015 11:12 PM View respondent's answers
Day to day reminder of food expiry date.
12/1/2015 10:19 PM View respondent's answers
Connecting appliances with P.C and smart phone.
12/1/2015 10:01 PM View respondent's answers
A dashboard for you to monitor your meal time and how long it is going to cook meals.
12/1/2015 12:52 AM View respondent's answers


Q10
Customize
Export
How often do you buy Food Products with a loyalty card online?
Answered: 8 Skipped: 1
Extremely often
Very often
Moderately often
Slightly often
Not at all often
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

Answer Choices	Responses	
Extremely often	0.00%	0
Very often	37.50%	3
Moderately often	0.00%	0
Slightly often	25.00%	2
Not at all often	37.50%	3
Total		8