



Software Development Teach Yourself Series

Topic 6: Software Requirement Specifications Unit 3

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CASE STUDY



All Teach Yourself Series in this package will refer to the following case study.

Tariq Mulner is the manager of a school canteen. He manages how many lunches are going to be prepared each day. It is difficult to tell how many lunches will be sold, so he would like a software solution that students can use to order lunches. This application would provide him with a complete list of orders.

Most of the students have smart phones, so Tariq is suggesting the solution is a phone app that can read in the lunch order, and send it to his device so he can print out the order list.



Photo by Tirachard Kumtanom from Pexels used with permission

Software Requirement Specifications

The SAT requires that you prepare an Software Requirements Specification (SRS). This is an analysis document that will inform your designs. This is the structure you can use.

Introduction

Identify the problem the software is going to solve.

In the case study – the problem that Tariq is encountering is not knowing how many lunch items to prepare for staff and students at lunch time in the canteen.

Identify the purpose of the software solution you are investigating.

The Canteen App will provide students with an opportunity to order their lunch in advance which will ensure they always get their order. It will also provide Tariq with accurate numbers of items to prepare for lunchtime.

Intended Audience

Describe the end users and other stakeholders in terms of relevant characteristics such as age, experience, attitudes and background.

The end users of the Canteen App include Tariq who is young and eager to learn new skills. Some of the other canteen workers are older and are more fearful of the new system. Students are young and eagerly use mobile apps.

Identify the main end users and their needs.

Tariq is a main end user. He requires access to accurate totals for each item ordered by 11 am each day so he can prepare the food for the lunchtime rush. He may encounter students with poor memories who think they ordered and he may need to look up their ID number to see what their order was that day.

Students and Staff of the school are also main end users as they will be ordering their lunch each day through the App. They need to be able to order their items, be able to see if items are unavailable, and a total price they will need to pay when they pick up their lunch.

Identify any occasional and low-end users and their needs.

On occasion other canteen workers may need to use the software to access student orders to check if they are picking up the correct order.

Overall Description

Describe the results of data collection. Refer to all the collection tools and the results, which should be included as figures or in the appendix.

This is where you, the developer, must report on the data you collected from the client, and their customers. All the raw data and any figures can be stored in the appendix. Ensure the data is the result of a wide range of collection techniques and methods (interviews, observations, reports and surveys).

Describe the relationships between the data, users and the digital systems. Refer to analytical tools: Context Diagram, Use Case, Data Flow Diagram. Identify the Use Cases from the diagram in a table so they can be referred to in the Functional Requirements.

Operating Environment

Accurately describe all relevant aspects of the technical environment (hardware, software, networking capabilities) Technical aspects of equipment such as memory, speed, operating systems.

The Canteen Ordering System will operate in two environments: Tariq’s office and the student’s mobile devices.

Canteen Manager’s Office

Hardware	Office PC • Hard Drive (300GB) • Processor (3.4 GHz) • RAM (8GB)	School Server • Hard Drive (300GB) • Processor (3.4 GHz) • RAM (8GB)	Printer
Operating System	Win 10	Win 10	
Software Applications	Acrobat Word Excel	NOS	Printer Drivers

Customer’s Mobile Devices

Hardware	iPad iPhone	Android Table Android Phone
Operating System	iOS	Android
Software Applications	The Canteen App Apple App Store	NOS Google Play

Scope

Describe the scope in relation to the user needs. What will be included in the final software prototype. What will not be included in the prototype.

The Canteen Ordering System will:

- Enter student and staff numbers and check for passwords
- Enter student and staff order details (product and quantity)
- Produce a total cost for the order and an order number with the details as proof of order
- Add the order details to a tally for each product
- Cease to operate at 11.00am
- Produce a printable report that lists the total number of each product ordered
- The interface for the ordering App form will be compatible for all mobile devices including mobile phones and tablets.

Limited to Android OS mobile devices for this prototype

The Canteen Ordering System will NOT:

- Keep records on stocktake of ingredients
- Order from suppliers
- Keep records of items that require re-ordering
- Calculate profit and loss statements

Constraints

Describe the constraints to the development of the project in terms of skills, time, financial, technical, legal and social considerations.

Economic & Time Constraints: This solution is a prototype and will not be costed as a commercial product. However, there is a schedule for completion in 8 weeks with the deadline: Friday September 1st.

Technical Constraints: Input is limited to mobile network coverage and the network servers at the school. The capacity of the drives will limit how much data can be stored.

Social Constraints: Willingness to use new technology and inclusion for impairment need to be considered.

Legal Constraints: Privacy and Copyright laws need to be observed while the development takes place.

Functional Requirements

Ensure each requirement is allocated a key such as FR1 so it can be linked to evaluation criteria.

Make a detailed description of each requirement. Ensure you include each input and output as well as the processes and storage of data.

No	Requirement	Notes
FR01	Interface of the Customer's App allows a choice to select from all products available.	This may need to be organized into categories so as to limit the number of selections on the screen.
FR02	The Customer's App allows for quantities to be entered for ordered products.	
FR03	Customers will be provided with a statement of their order details along with an order number	This could be emailed or texted.
FR04	The app must store the order details in a file (ORDERS)	
FR05	The app needs to search the file (PRODUCTS) and add the order quantity to the TotalNumber of the ordered products	A multi-dimensional array
FR06	The App must provide access to the ORDERS file from the management interface.	
FR07	The app will sort the ORDERS file by name	
FR08	The App must provide access to the PRODUCTS file from the management interface.	
FR09	The app must be able to print the ORDERS and the PRODUCTS files.	
FR10	The App must cease to take orders at 11am	
FR11	App must inform customers that the orders have	Interface change

	ceased at 11am	
FR12	Validation to ensure empty orders are not placed through customer interface.	

Non-Functional Requirements

Ensure each requirement is allocated a key, such as NFR1, so it can be linked to evaluation criteria. Make a detailed description of each requirement. Ensure you relate each requirement to the factors that affect efficiency and effectiveness. Don't forget safety and security requirements. Add any notes to describe the requirement further.

No	Requirement	Notes
NFR01	Customer interface needs to attractively designed	School colours (Blue, Green, Gold)
NFR02	Customer interface needs to be robust – with validation in place to deal with unexpected and inaccurate input.	
NFR03	The customer interface needs to present responses to input as the orders are made.	As order is made an icon can add to the number of items in the cart.
NFR04	The customer interface needs to be easy to read and adaptable for portable devices. Optimized for touch screens.	
NFR05	Management interface to have details regarding updating product list	
NFR06	Clear buttons and other objects use designs that are easily recognisable in their use.	
NFR07	ORDERS and PRODUCTS files need to be easy to maintain and access.	Desktop icons or links from interface
NFR08	The report should be printable directly after 11am.	

Appendix

In the appendix you must place all the tools you used to draw your conclusions from:

- Data Collection Tools
- Collected Raw Data
- Context Diagram
- Use Case Diagram
- Data Flow Diagram.

It is important that each appendix is referred to in the text of the SRS.

Appendix 1: Data Collection Methods

Collection Method	Justification
CM1: Interview – one on one questions with Canteen Manager. Some are open questions to illicit ideas and unanticipated information.	To investigate the full requirements and scope needed by the Canteen Manager
CM2: Focus Group – a team comprising of students, teachers, general staff	To gain insight into the needs and issues relating to the solution and app usage at school

Appendix 2: Data Collection Tools

CM1: Canteen Manager Interview

Q1. What do you want this software to do?

The Canteen Manager, Mr. Phillips needs a solution to a growing problem in the management of his canteen. He requires a software solution that allows students to order their lunch before 11am so that Mr. Phillips can know what to cook for lunch time.

Q2. Do you need it to provide proof of ordering at POS?

Actually, Yes! That would be a good idea – just in case we have a situation where we run out of products and a student claims they ordered on.

Q3. Will other staff in the canteen need to access the system?

Occasionally I might need another staff member to print out the report or look up an order.

Q4. How many sales are you currently making – so we know what to expect in way of number of orders

Hard to say – about 200 meals a day, maybe more with a new system.

CM2: Focus Group Discussion Points (Students and Staff)

Point One: Would you use an app to order your lunch before 11am

- * Yes 35%
- * No 10%
- * Difficult to order when there is training in the mornings
- * Can't use phone at school after 8.30am

Point Two: What would stop you from using the app?

- * Mistakes in orders
- * Hard to use
- * Slow to use

Point Three: What do hate about apps you have used in the past.

- * Expensive
- * Buggy
- * Go round in circles when you can't enter data

CM3: SURVEY (students)

What do you use regularly each morning?

- iPhone 46%
- iPad 1%
- Android Phone 40%
- Other Tablets 1%
- Other Phones 2%

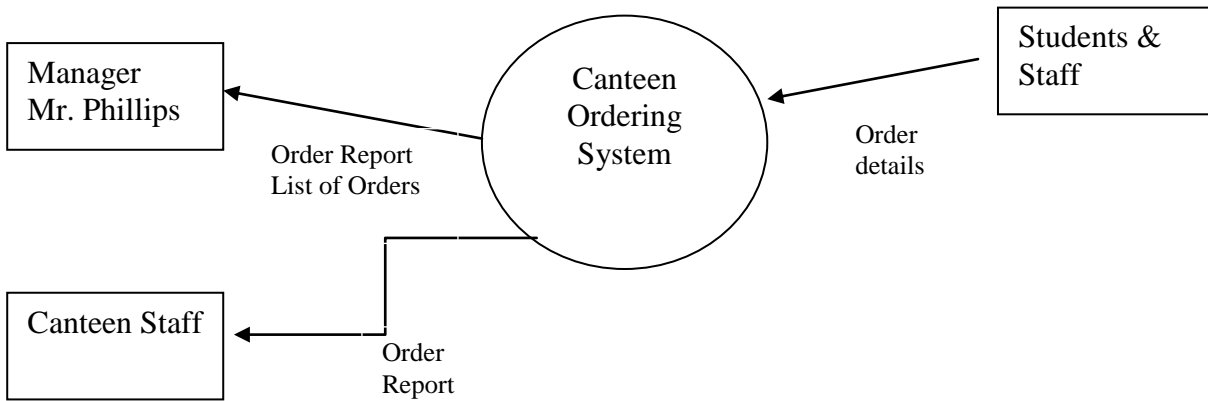
Would you use an app to order your lunch? YES (77%) NO (21%) Don't Know (2%)

When in the morning would you order your lunch?

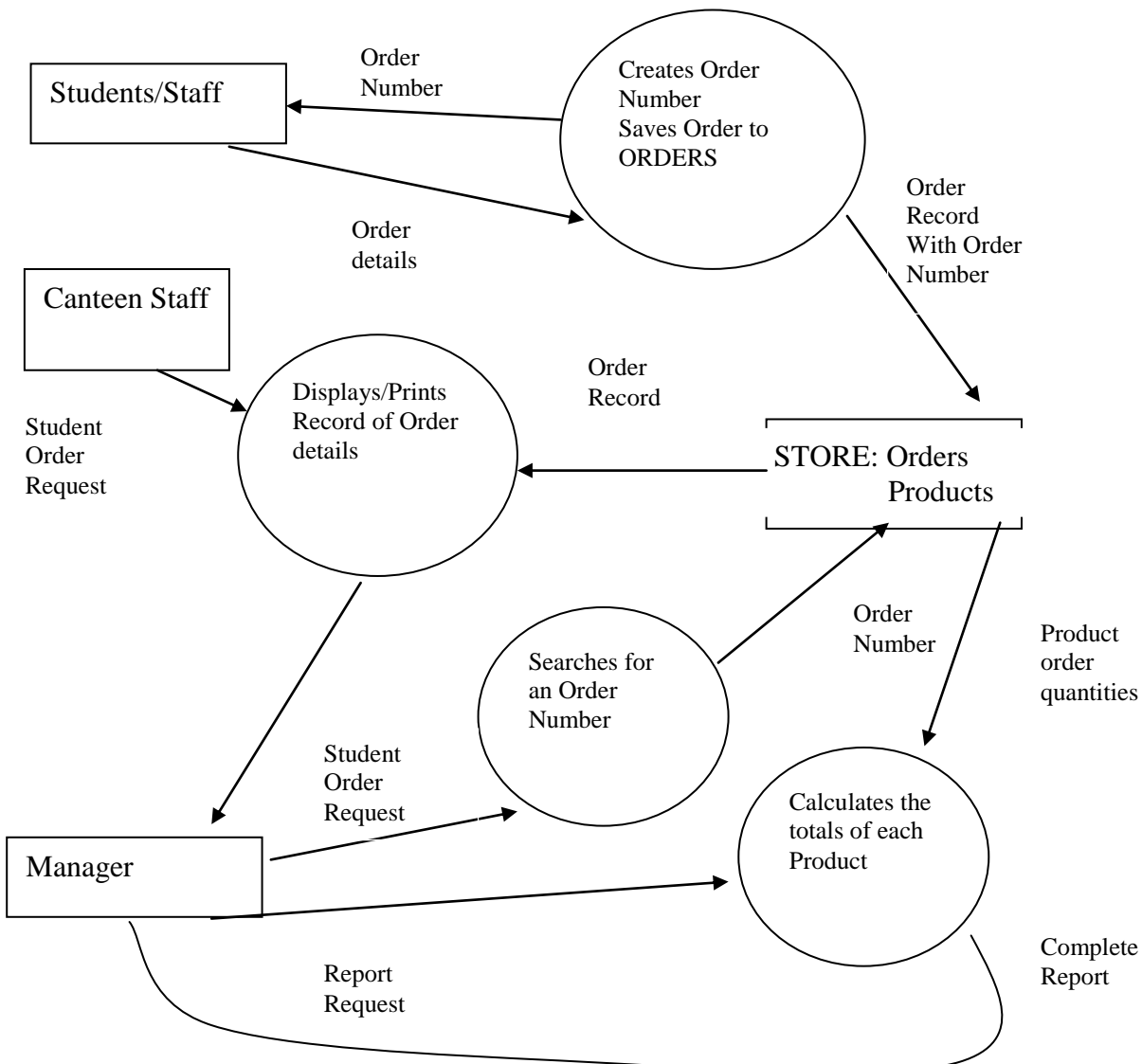
- 6am – 7am 12%
- 7am – 8am 61%
- 8am – 9am 23%
- 9am – 10am 4%
- 10am – 11am 0%

A2: Folio of Solutions

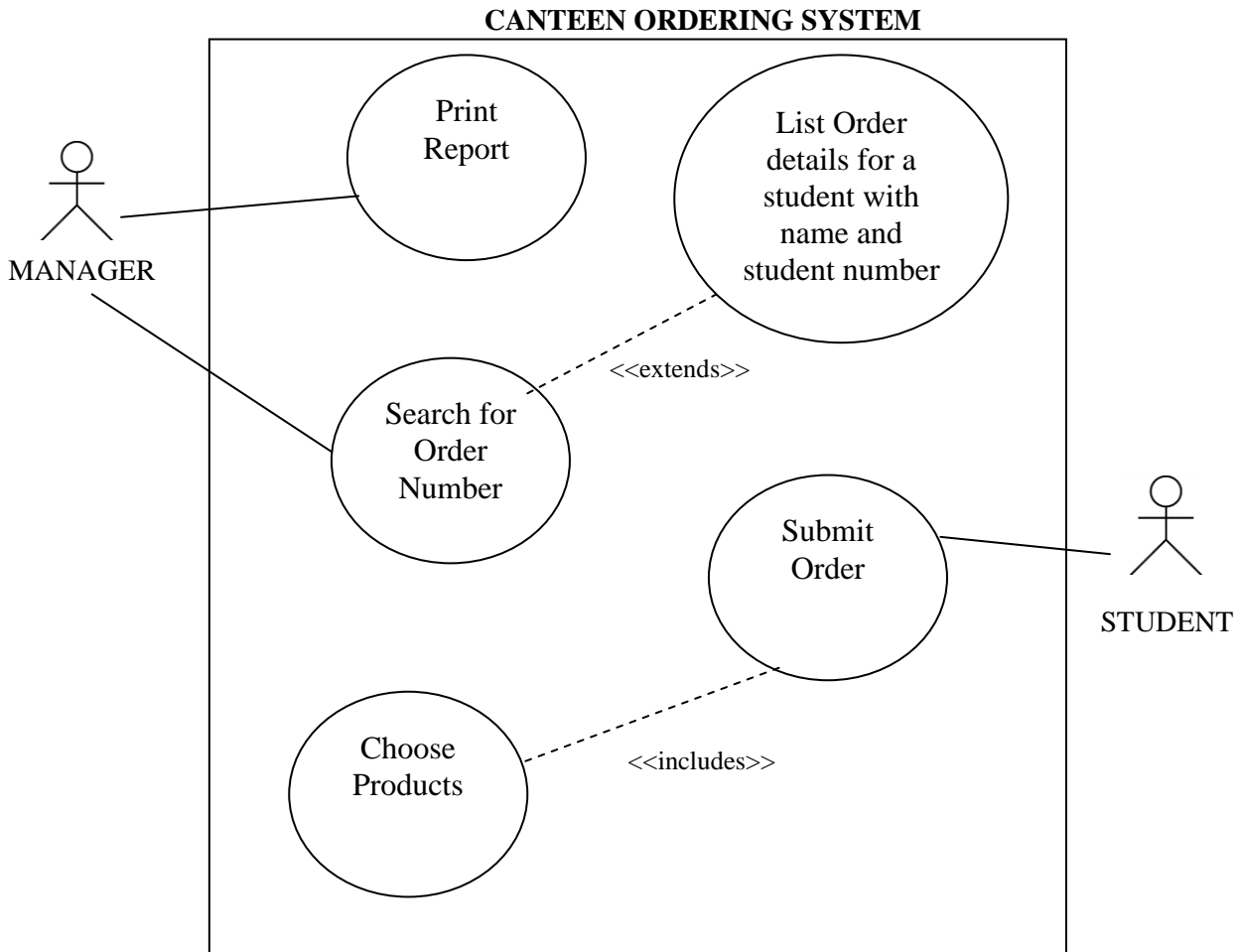
Context Diagram



Data Flow Diagram



Use Case Diagram



No	Use Case	Notes
UC01	Print Report	This report lists all the products and how many of each are required to be prepared.
UC02	Order Number Search	Returns a list of orders that is searchable to match order numbers at POS. <<extends>> If there is an issue the Manager can call up a particular order along with the Student details.
UC03	Order Submit	POS where customers order their lunch. <<includes>> options of different products under different categories to allow for choice.

Review Questions

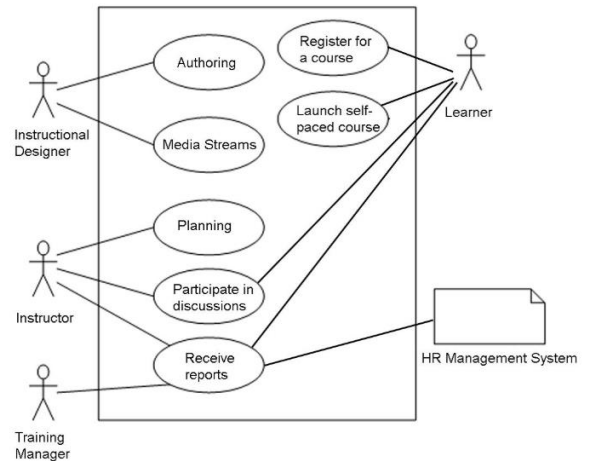
Applied Questions



Tariq has asked you to produce an app. The Analysis is available in TOPIC 1. You have 3 weeks to develop the app to hand over. Ideally Tariq should have the solution for 2 weeks before evaluation begins.

1. Describe the relationships between the data, users and the digital systems for Tariq’s Canteen App. Refer to analytical tools: Context Diagram, Use Case, Data Flow Diagram in the Appendix. (use the Appendix numbers)

2 Identify the Use Cases from the diagram below in a table so they can be referred to in the Functional Requirements.



3. Name FIVE relevant characteristics of software users that need to be taken into consideration.



Solutions to Review Questions

1. In the overall description you need to identify the data that each of the users will require and the digital systems used by them to process that data.

Users	Data	Digital Systems
Students/Staff (Customers of Canteen)	Student Login Student ID Lunch Item Selections Order Number Quantity of Items for Order Lunch Item Prices Total Cost of Order Lunch Item Availability	Mobile Application Mobile Phone Network Mobile Phone OS Mobile Phones
Canteen Manager	Lunch Item Selections Lunch Item Prices Lunch Item Availability Total Number of Orders per Item Lunch Order Report Student ID Order Number	Desktop Computer Windows OS Printer
Canteen Workers	Lunch Order Report Student ID Order Number	Desktop Computer Windows OS Printer

The table above illustrates the relationship between the digital systems required and the data with the users. In Appendix A2 The DFD shows that the customers of the canteen are expected to enter their order details. The manager requires the list of all the items orders and the total number of each item ordered. Both the Manager and the Canteen staff will require access to the lunch order report. In the case that a student has forgotten their order, or there is a mistake, both the manager and Canteen staff can look up the order with the Order Number and Student ID.

2.

Use Case Number	Use Case
UC1	Register for Course
UC2	Launch Self-Paced Course
UC3	Authoring
UC4	Media Streams
UC5	Planning
UC6	Participate in Discussions
UC7	Receive Reports

3. User Characteristics include:

- Age
- Gender
- Education
- Language and culture
- Computing skills
- Physical abilities and disabilities
- Other skills related to the work place.
- Job experience and competence
- Place in the organizational hierarchy
- Attitudes toward change and the use of technology
- Ongoing issues or problems relating to the user's tasks or activities