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Requirements capture exercises

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Abstract

Realistic scenarios are presented with contextual information. The exercises allow the process of requirements elicitation from brainstorming to be practised. Exercises are presented that involve user requirements and user stories.

1 Introduction

The purpose of these exercises is to practice requirements elicitation and analysis from realistic scenarios. A small group should read through the information that is presented for the scenario and create user requirements or user stories as requested.

2 Scenario: Cargo ship monitoring

Context

Large marine cargo ships take goods from one country to another. They need to be maintained and parts need to be replaced to allow them to continue to operate. Parts can take a long time to order and any time that is spent in dock waiting for parts to arrive is lost time at sea. To improve the utilisation of the cargo ships, parts should be ordered before a ship arrives at the next dock. Software is needed that interfaces with sensors that monitor key systems. Low-cost sensors and embedded electronics should monitor the diesel engines, pumps, thrusters and main propeller systems for wear. If any one of these systems is reaching the end of life or needs to be serviced, the software application should order a new part. This should allow the cargo ship to arrive in dock and have the part fitted on arrival.

The software that is running on the embedded electronics, which is connected to sensors, should send sensor readings across a local computer network to a master control system. The master control system should only allow connections from the embedded electronics on a computer network that is dedicated to monitoring data, preventing access from other devices that might have gained access to the monitoring network.

The master control system should analyse the monitoring data and compare it against wear profiles that describe when each part will fail. These wear profiles should be stored in a database, such that there is a wear profile per part. It should be possible to import new wear profiles with new part numbers.

The master control system should be connected to the ship's main computer network, allowing it to send requests for parts to a dock computer system. The data that are sent to the dock system should include a part name, serial number, status and expected arrival time of the ship. The dock system should reply to the ship's master control system to state that the information has been received. The dock system should provide the master control system with an order number that is associated with each part order.

The master control system should provide the captain with a display of the key parts and their status. The master control system should also allow the captain to view the status of any part orders. It should provide the captain with a web link to the order page, where the status of the part can be monitored.

Requirements capture

- Read the context and brainstorm user requirements in a small group.
- Create a table of user requirements.
- Classify each user requirement as either functional or non-functional.
- Add category information for each user requirement.
- Use the MoSCoW prioritisation for each user requirement.

3 Scenario: Outpatient monitoring

Context

Patients with chronic diseases often require visits to hospitals. Patients may be stable for a while and not require a hospital appointment. Therefore, routine hospital appointments may not be needed, if software can recommend action and inform remote medical staff. Likewise, more rapid action could be taken if a patient's vital signs suggest that it is needed.

A hospital trust has requested that a mobile application is written that enables remote monitoring of patients. The patient's mobile phone should interface with blood sugar, blood pressure, pulse, and oxygen saturation sensors over a bluetooth network. The software should be configurable, such that it can log blood pressure and pulse for those with heart conditions, blood sugar for those with diabetes, and oxygen saturation for those with breathing conditions. The software should allow doctors to set thresholds for each sensor, such that if a patient's vital signs are irregular or out of range, the doctors

are notified. The thresholds should be stored in a database on the patient's mobile phone. The software should connect to the hospital to download the thresholds when it is connected to a mobile data or local WiFi network. If the patient's vital signs are irregular, the patient should be notified and the hospital doctor should be informed. If the mobile phone does not have access via mobile data or a local WiFi network, it should request that the user connects via mobile data or a WiFi network. The software should send a report to the hospital doctor as soon as either mobile data or a WiFi network is available.

Requirements capture

- Read the context and brainstorm user requirements and user stories in a small group.
- Create a table of user requirements.
- Classify each user requirement as either functional or non-functional.
- Create a table of user stories, where at least one user story is related to each functional user requirement.
- Add the user requirement numbers to the user stories table.
- Add category information for each user story.
- Add story points to each of the user stories.
- Highlight the user stories that should be included in a minimum viable product.