# **Software Development 2012 Unit 3 – Outcome 1 (40 marks)**

**Description**: Analyse an information problem in order to produce software requirements specifications for a solution that operates within a networked environment.

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| ***Identify the key tasks involved in planning the solution.***  description of the intended **purpose** and **environment** for software  documents the key tasks associated with the **analysis stage of PSM**   * **Describe the requirements of the software solution** The requirements of the software solution will be able to be found during analysis as we will look at the current system and its inefficiencies of data flow. This and feedback from the personnel will be used to design and develop a new solution later on. * **Describe all relevant constraints on the solution** The constraints on the solution will need to be discovered as these will set what we can and can’t do later on down the track. Constraints may include time, cost and resources available. * **Determine the scope of the solution** As the IT Helpdesk is only a small part of the Beaconhills network, we will not only need to look at what the system needs to do, but also what it does not need to do. * **Describe any security vulnerabilities that will affect the design of the software solution** Security vulnerabilities have the potential to ruin any network and any system running on a network, so all potential threats have to be looked at. * **Identify the personnel and their role in the system** With multiple types of users going to be in contact with the Helpdesk, we need to look at all roles. Such users will include administrators, teachers and students and all of these will interact with the system in different ways. |  | / 2 |  |
| ***Propose a range of data collection methods.***   * onsite visits * questionnaires, surveys, interviews * a needs analysis of the client's business environment * observation of the current system * data gathering on the current system |  | / 2 |
| ***Describe the networked environment in which the solution will operate (including the type of network, hardware, software and protocols).***  Beaconhills’ network consists of 1Gbit fibre optic between all buildings and 100mbit to the desktop. This also allows it to be connected over longer distances, as UTP can only be cabled up to 100m.  The hardware used include wireless access points, switches, servers.  The wireless access points are used for devices such as laptops, tablets and mobile devices to connect to the network. Switches are used to connect all of the workstations in a classroom to the network.  The software used on the network is Windows Server 2010. This allows the administrators to control user access, create, modify and delete user accounts and run virus scans and backups. It allows users to access their files that are stored centrally on a server.  The two protocols that run within the network are *ethernet* and *802.11b/g*. Ethernet is used for communications via wired transmission media such as UTP, where 802.11b/g is used for connecting wireless devices and allowing them to communicate with the network.  The current system in place is very slow and inefficient as the students and staff must contact the IT technicians directly (in person) to notify them of a current problem which could potentially be very time consuming if they are not in their office and therefore must be sought after. |  | / 4 |
| **Use Case diagram**  **UCD-** Represent the relationships between the users, the network, including data flows, and the proposed solution diagrammatically. T**he system's functional requirements- high-level user goals/functionality.**  **Correct actors (roles- including systems)**  **Correct associations- used of arrows. Primary/Passive actors.**  **Correct includes- functionality of a use case is used in another use case.**  **Correct extends- indicate conditional activities**  **Correct system boundaries** – defines the limits of the system |  |  |
| * Correct use of symbols (actors, use case, system boundary, associations and any relevant includes or extends) |  | / 2 |
| ***Use case accurately represents the functions described in the organisation.*** |  | / 8 |
| **Data Flow Diagram (DFD)** |  |  |
| * Correct use of symbols (entities, processes, data flows and data stores). |  | / 2 |
| * DFD accurately represents the processes described in the organisation. |  | / 10 |
| ***Analysis of DFD (describe any inefficiencies or omissions that will need to be addressed in the design of the software solution).***   * Only teachers can log jobs – Students must tell teachers the issue and teachers must pass this on to the technician, which wastes a lot of time. * If technicians aren’t near a computer they don’t know about the issues |  | / 2 |
| **Requirements, constraints and scope** |  |  |
| ***Describe the requirements of the software solution including functional and non-functional requirements.***  The **functional requirements** (what it is required to do)  Lodging Service Requests- The inputs it will receive (problem details, hardware, log in issues,…) The output from the system The user that logged the job should be able to view its status and be informed when the problem has been solved.  Login- students, teacher, student IT and IT technicians- **Differentiating Administrative Rights**  Service Storage – saving the requests in the mobile |  | / 2 |
| ***Non-functional requirements of the solution (solution attributes and features) Software quality attributes***  **User-friendliness** As there will be a large number of personnel using the system, it needs to be intuitive and accessible to staff, students and technicians.   * performance levels/requirements * response rates, * robustness, * portability- * reliability – lots of users at once * maintainability * Project documentation * User documentation * Back Ups * **Security** |
| ***Describe all relevant constraints that affect the solution.*** The parameters of the solution (**scope**). defines where a solution’s responsibilities end  The conditions affecting the solution (**constraints**)  **Cost  time**  **Software run on the small screens**  **Level of expertise of users, middle school,**  **Legal requirements**  **Technical support staff**  **Security features**  This system will be used by the staff and students at the college to lodge service requests on their mobile which will be dealt with by the IT technician and volunteering students. The system will be used by these technicians to view the information (to be stored in a database) about the school’s IT issues (whether it be hardware or software). They will also post regular updates on the issue being looked at by the technicians to be read by the other users online. |  | / 2 |
| ***Describe any security vulnerabilities that will affect the design of the software solution.***  Security is not as good generally on wireless connections so they will need to make sure to use encryption, most likely WPA2.  A major problem that would waste time would be **fictional jobs** being logged by students. This can be overcome to an extent by making sure that a student is logged in to BeaconNet before they log the job, as it will identify which student has logged the job.  Viruses introduced |  | / 2 |
| ***Demonstrate an understanding of the personnel and their role in the system.***  **Students**  Students will no longer have to inform teachers about problems with the computers or their inability to log in. Students can now access the Helpdesk themselves and log a job for themselves. They will also be able to view the status of their logged jobs.  **Technicians**  Technicians will still need to respond to the jobs that have been logged. One change under the new system is that they will need to carry a mobile, web-enabled device to access the Helpdesk and view pending jobs. This will assist them as they won’t necessarily have to go back to their office to find new jobs.  **Teaching Staff**  Teaching staff will still be able to log jobs. They will have basically the same role as always, however it will be diminished as rather than have to log all jobs alerted by students, they will only need to log jobs they find themselves as students will be able to log jobs themselves. |  | / 2 |
| **Total :** |  | **/ 40** |

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| **User** | **Expertise** | **Functions to be used** | **Level of access** |
| Student | good enough to use the system effectively and their portable devices | They will need to be able to enter data about the IT problems into a form which gets sent to a database from a mobile device. They will also need to be able to check their email inbox for Beacon Net passwords and use Beacon Net to track the progress of the problems. | Basic level access |
| Teacher | good enough to use the system effectively and their portable devices | They will need to be able to enter data about the IT problems into a form which gets sent to a database. From a mobile device. | Basic level access |
| Student Volunteer Technician | Ability to program and understand the functions of the system | They will simply need to read the problems listed in the database and be able to update their progress on Beacon Net. | Medium level access |
| IT Technician | Ability to program and understand the functions of the system | They will simply need to read the problems listed in the database and be able to update their progress on Beacon Net. As a higher level technician however, they will have to email Beacon Net passwords to students and reset login details of the students (not a function of the system). | high level access |

# Use Case Diagram







