

Initial Plan



Title: District Nurse Call
scheduling problem

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(40 Credits)

Description:

A team of district nurses allocate their calls and then they have to individually organise their call list for the day. They have to go through each call and decide what time of day the call needs to be carried out, what equipment they need and based on distance between calls. They try and complete calls which are in close proximity in order to try and save as much time as possible. This scheduling can be a time consuming task which needs to be done a day in advance in order to gather correct equipment and in some cases other members of staff need to attend certain calls together. Some calls require multiple members of staff and therefore the time needs to be arranged in advance in order to coincide with all members of staff call lists.

In many cases calls need to be swapped among staff for many different reasons. Some calls need to be swapped because a member of staff may not have the right band level and skills to complete a call. Another reason could be due to time constraints for certain calls there may not be enough time to cover all calls given and therefore need to be shared out so all calls are covered by the end of the day.

This project will allow for a system to be created to assist a team of District nurses in the local areas with their call scheduling problem. This system will be available to nurses on the office computers. This system will allow an administrator to input data for patients and district nurses. Using this data the system will be able to calculate the most appropriate calls list for each staff member.

The system should optimize staff time within patient's houses and allow for more time to fill in important paperwork. This system will achieve this by providing all members of staff with an individual log in where they can access their call lists each day.

Aims & Objectives:

The main aim of this project will be to develop a system to assist a team of district nurses in the local area with their call scheduling problem.

The primary function for the system is to:

- Provide a set of calls for each district nurse
 - This will need to be carried out each day and depending on what level of staff are working and the type of patient calls.
 - These calls need to be equally distributed amongst the staff.
 - There will be a prerequisite list of patients and nurses within the system.
 - A certain number of calls which require bloods to be taken need be allocated to each member of staff in order for blood samples to be sent off by the deadline. This needs to be done before 12pm in order for the bloods samples to be sent off to the lab.
 - Calls should have short description in order to explain the procedure of a call, the equipment they will need and whether they need another member of staff/carer to assist with the call.
 - Provide an even estimate time for each call in order to calculate the amount of calls that can be completed in one day.
 - Calls to be allocated based on certain areas and proximity of calls. This can help reduce the amount of time staff spend in the car and optimise the amount of time staff can spend with a patient.
 - Provide details to staff members on how to access the property of each patient, for example some require key codes.
 - Should state to staff whether they need to arrange with family members if they wish to be present at a particular call.

Additional functionality:

The secondary function for the system is to allow for:

- Staff and patients data can be changed:
 - This could be due to staff changing details (for example, moved home or changed band level.) Band levels need to be correct in order for calls to be assigned to the correct members of staff.
 - Another reason could be patients not needing calls from district nurses anymore (for example, wounds could have healed or patients deceased.)

The tertiary function for the system is to take into account:

- Time constraints:

- Calls take different times depending on the type of call (for example, wound dressing would not take as long as Palliative care. Correct times to be added in order to calculate a more accurate call list.
- Some time needs to be allocated for time to be spent with the families of patients. Since some patients cannot communicate ably and therefore families members need to give permission for nurses to give care. For example people suffering with dementia and brain damaged individuals.

The quaternary function for the system is to take into account:

- Call reallocation:
 - Allow for the system to automatically create new calls lists immediately when a member of staffs calls in unable to complete a number of calls. The incomplete calls should be divided amongst the staff remaining on duty.

Deliverables of Interim Report:

The key deliverables for the Interim Report are:

- Give detailed analysis of the main problem.
- Research and give an evaluation of existing systems.
- Description of the approach going to be taken in order to address the problem.
- Design basic use cases for the system.
- Create a set of personas and user stories.
- A set of user requirements.
- Write functional and non-functional requirements.
- Write a set of benchmarks which can be used to determine whether an acceptable standard is reached at the end of the project, this is called Acceptance Criteria.
- Research and give an evaluation on research methodologies.
- Background research and give results of this.
- Create a set of basic user interfaces which can be used as a guideline for the final system.
- Develop algorithm to allocate calls.
- Evaluate appropriate programming languages to use.
- Provide an up to date time plan and ideas for future work.

Deliverables of Final Report:

The key deliverables for the Final Report are:

- Summary of updated user requirements and design since the interim report.
- Give overall findings and achievements of the project.
- Set of Test Cases to be used in order to test the running of the system.
- Database design.
- Architecture and data design such as more detailed use cases and class diagram.
- More detailed user interfaces and design a set of procedural designs.
- Explanation of the more challenging elements of implementing the system.
- Give an evaluation of the design, project management and methodologies used.
- Provide an up to date time plan and give a more detailed set of ideas for future work.

Week by Week Plan:

Autumn semester:

There will be a weekly meeting both with the client and moderator.

Week 1:

- Gather information from client in order to have clear view on what the client requires.
- Write up draft initial plan.

Week 2:

- Edit initial plan.

Week 3:

- Create Gantt chart.
- Finalise initial plan and hand in.
- Research background of the day to day running of district nurses.
- Research for project.
- Finalise what is required for the project to meet all requirements.
- Gather fundamental and non-fundamental requirements.

Week 4:

- Research waterfall and other models best suited for this project.
- Research any existing systems.
- Gather acceptance criteria and assumptions for the project.
- Explain the approach how the problem will be solved.
- Work out all users required for the systems.
- UML diagrams for primary functionality.

Week 5:

- Draw some templates of what the system could look like.
- Develop algorithm to allocate calls.
- Research programming languages to use.

Primary functionality:

Week 6:

- Start Implementation – Database design and familiarise with programming languages.

Week 7:

- Continue with Implementation – aim to have interfaces created and algorithm.

Week 8:

- Continue with Implementation – aim to have all interfaces created and begin working on creating databases.

Week 9:

- Begin to write up interim report.
- Continue with Implementation – Integrate databases and interfaces together.

Week 10:

- Continue writing up interim report.
- Finish basic functions of implementation.

Week 11:

- Submit report.

Spring semester:

Week 1:

- Create test cases for core functionality.
- Testing of core functionality.
- Continue implementing the system making sure functional requirements are working and move on to additional functionality.

Week 2:

- Update requirement of additional functionality and create UML diagrams.
- Continue implementing system.

Week 3:

- Continue implementing system making sure basic aspects of the system are on track.

Week 4:

- Continue implementing system making sure system is working correctly.

Week 5:

- Continue implementing system making sure the system is tested based on test case criteria.

Week 6:

- Test system and fill in test cases.
- Finalise implementation. Make sure the system is complete and ready to be fully tested.

Week 7:

- Edit system if any test cases fail.
- Begin writing up the final report.

Week 8:

- Write up Evaluation.
- Continue writing up the final report.

Week 9:

- Continue writing up the final report.

Week 10:

- Finish gathering work in order to finalise final report.
- Send draft to supervisor and moderator.

Week 11 (week ending 5th May):

- Finish final report and hand in.