**Assist Medical Care – Dashboard system**

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The requirements for the degree of

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By

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**Chapter 1: Problem Specifications**

**Introduction**

With the ever growing strain of the work demand escalating and the workforce shrinking, with less funds to employ staff and the stress of these growing demands is causing GP’s to the reduced amount of session or retire earlier (Dr Chaand Nagpaul, 2015). As Dr Chaand Nagpaul points out the scale of these demands “Sixteen times more patients will visit their GP surgery today compared to the numbers who’ll attends A&E” (2015). Consequently, the notion of the transitional family doctor who has known a patient and there family for years is becoming scarce. Although GP’s are committed to providing a high level of care to each and every patient under these conditions quality of care will be affected.

**Transitional family doctor vs current General Practices**

As Wendy A. Rogers and Annette J. Braunack-Mayer highlight the importance of the relationship between the transitional family doctor and patients. Rogers and Braunack-Mayer illustrates this by pointing out “Once a patient appears at a GP’s surgery, the GP is committed to providing care to that person, whether they attend the surgery frequently or infrequently, in good or ill health.”(2009, p.3). As specialties may be able to offer specific treatments it’s the general practice take into account a patients physical and psychological profile when treating them (Rogers & Braunack-Mayer, 2009, p.3). However, even though general practices follow a holistic approach this can be challenging as patients even with an ongoing illness, symptoms’ may not always be visible (Rogers & Braunack-Mayer, 2009, p.4). Consequently patients with serious diseases can seem to have more routine then it actually is (Rogers & Braunack-Mayer, 2009, p.4). Even with these challenges it is the GPs’ responsibility assisting patient decide and acquire appropriate medical care (Rogers & Braunack-Mayer, 2009, p.5). As highlighted for this holistic approach to operate there need to be a great wealth of knowledge not just of a patient’s current health but of theirs’s and even their families’ medical history (Rogers & Braunack-Mayer, 2009, p.27). The amount of information and the relationship between GP and patient evolves over time (Rogers & Braunack-Mayer, 2009, p.27).

Modern GPs’ still follow a holistic approach, viewing the patient as a whole by taking into consideration their physical, psychological and social needs (Dr Chaand Nagpaul, 2013, p.3). However, the relationships between is being disturbed by the growing challenges the NHS face. As Nic Paton mentions the “NHS has outlined the scale of some of the future public health challenges it is likely to face, including a combination of more people living longer with more complex conditions, rising costs while funding remains flat and rising expectation of the quality of care.” (Nic Paton, 2013, p.1). Dr Chaand Nagpaul argues that “More than ever before, general practice is under severe pressure.” (2003, p.3). The workload and expectations of the NHS is ever increasing without the increasing workforce to combat this (Dr Chaand Nagpaul, 2013, p.4). Becoming more efficient and cost effective is vital to the NHS survival as there is a predicted overspending of 30 billion between 2013/14 and 2020/21 (Nic Paton, 2013, p.1). There is great concern that these cut backs and increased workload will weaken GPs’ ability to continue building relationships with patients and instead there will a shift in focus to meeting targets than patient care (Dr Chaand Nagpaul, 2013, p.4).

**How does this effect patients?**

With the population and life expectance increase there is a lot of pressure on the NHS to meet demands. As patients get older they are more likely to have on going illness meaning more frequent visits to the GP (Dr Chaand Nagpaul, 2013, p.4). As Dr Chaand Nagpaul highlights “The average member of the public now sees a GP almost six times every year – twice as much as a decade ago.” (2013, p.3). With GPs having more consultations to deal with it is more difficult to give the same quality of care which would have provided previously. Also with greater numbers to see patients usual may not always be able GP. As even though another doctor would be able to provide the same amount of expertise as their usual GP would, the doctor would not have the same relationship with the patient as their GP would. Also their GP would know more about the patients’ medical history and even though a new doctor would have access to their medical records would be less likely to make the connection between past and present ailments if not previously aware. As a new doctor might not be aware of how many times the same or similar symptoms have reoccurred. Consequently a new doctor would be more likely to judge a patient’s on their current symptoms alone potentially missing an underlying cause or illness. In addition, because of a GPs’ commitment to all over their patients visiting and the sheer amount calls and consultations a GP has to deal with everyday means that GP will have to be as time efficient as possible to ensure every patient gets fair and equal treatment. With GP’s having more time restriction when investigate patients health and are consequently more likely to a patients symptoms to be caused by more routine kinds of illness and more likely to miss signs that an illness could be more serious than expected.

**What is already on the market?**

Since the objective is to still provide accurate care which best suits the patients’ needs there are products which can help aid the diagnoses process. For example, Isabel Healthcare offers a symptom checker which allows doctors to compare their results against the software’s. Rereinforcing already suspected causes and also suggesting other potential diagnoses. These symptom checkers take into account the patients age, sex, region and their current symptoms. Although current symptom checkers can offer advice to doctors on a patients’ current condition. They do not address the problem of making sure patterns in the patient’s health, which could determine if patients have more severe under lying illness, are not missed. To ensure that no pass illness are overlooked, all of the patients past conditions would need to be kept on record with a built in symptom checker. This ensures that signs of serious illness cannot pass as more mundane and routine illness.

**Conclusion**

To summarise, as mentioned the GP’s relationship with the patient is important to finding the correct diagnoses as a holistic approach allows the doctor to look at a problem from all angles. With recent cut backs the NHS is becoming more strained and with patients living longer they are more likely to need more care this means longer and more frequent consultations. Without more staff to balance the increasing workload it will become more challenging for a GP to continue building their relationship with each and every patient they see. As although software which could record and monitor symptoms cannot replace a GPs’ expertise it would be able to aid in the diagnoses progress.

**Chapter 2: Proposed solution and justification of development model**

Introduction

**Proposed solution**

As mentioned, in the last chapter the doctors relationship with their patients is important to the diagnostic process. As there needs to be an awareness of a patients history to fully understand causes for a patients current condition. Although a GP's intuition and expertise cannot be replaced by any diagnostic system a system could be implemented which could help monitor patients health. As with the aging population, with more patients to see, who are more likely to have more than one condition. A system which recorded patient’s symptoms, prescriptions, and if these symptoms reoccurred even with treatment, would lighten the burden of remembering each and every patient’s details. As software which records and monitors patient’s details would be able to take into consideration all signs no matter how seemly insignificant or long ago they may be. This system would have the potential to evolve. As the more informed it becomes of each patient and their families medical history the more likely the program would be capable of spotting potential signs. As a patient could be displaying the same set of symptoms a family member displayed before being diagnosed with another lying illness.

**How this program differences to similar ones on the market**

As mentioned in the last paragraph the main difference each online symptom checkers, which are already available, is that this diagnostic program will be recording the information as patient is being seen by the doctor and will taken directly from the patient's notes. So the program will have a fully record of the patient's medical history instead of only the symptoms the doctor deems nessassary or is aware of. So this program will have a greater depth of knowledge than conventional symptom checkers. However it not only how the information is rather makes this program stand out also how the information is displayed. Displaying the information dashboard interface will be the main focus of this project. As it is important that the information is conveyed in a clear and consist. As for the project to be successful the GP's need to fully understand the information being conveyed to them. Otherwise they will not be able to use the diagnostic program to its full potential.

The aim of this project is to create and implement a dashboard which is institute enough to clearly display it's meaning without direction. So a chart format will employed to convey when the symptoms first appeared and if the symptom persisted, clearly displaying the date of each occurrence. Using symbols and colour coding to display which symptoms indicate which illness and what the likelihood of the disgnoses is. Also a timeline will be displayed at the bottom to indicate over what time period these symptoms have been occurring. When a symptom reaches over a certain percentage there will be an alarm icon which will show to display that a pattern which may be concerning has formed. This icon will need to grab the professional users’ attention however be subtle enough not to concern any patient's who are able to see the screen. As even though a situation could raise where, the concerns of the system are similar to the GP's beliefs than the doctor might want to show the screen to the patient, to give a visual description of what signs lead to this verdict. Since the main focus of this project is to develop a dashboard GUI, developing and implementing a program which take in information from the patients notes would need left to further developments. However, it is worth the time to develop and implement code to record and receive patient notes to display how this program could potentially operate.

**Development model - Agile vs Waterfall**

The waterfall model consists of organising a software project into stages and to move on to nest the stage the completion of last stage must be confirmed (Hans van Vliet, 2007, p.48). Confirmation was obtained through a progress of Verification and Validation. Verification to ensure that the program is functioning correctly and validation to ensure that the program meets the clients’ requirements (Hans van Vliet, 2007, p.48). As Hans van Vliet explains “In each phase of the software development process, we have to compare the results obtained against those that are required. In all phases, quality has to be assessed and controlled.” (2007, p.48). This model focuses on perfecting the planning before attempting the implementation stage (Hans van Vliet, 2007, p.49). This attention to planning is to reinsure the software being developed meets the standards and requirements of the client (Hans van Vliet, 2007, p.49). Documentation is used to validate the clients’ requirements and to specific as much detail as possible (Hans van Vliet, 2007, p.49). However is not possible to completely identify ever user requirement so testing is carried out at the end of each stage (Hans van Vliet, 2007, p.49). This is to validate the product matches the clients’ requirements (Hans van Vliet, 2007, p.49). Although careful analysis of planning is reinsuring to the client and in theory should produce a product which satisfies the users’ requirements. However, this approach is very rigid and makes a change in direction more challenging (Hans van Vliet, 2007, p.50). Agile was introduced to provide a more flexible solution. The Agile model is designed with change expected (Hans van Vliet, 2007, p.50). The agile manifesto focus more on producing functioning software over lengthy documentation, opting for lightweight documentation (Hans van Vliet, 2007, p.50). Agile has a different attitude to dealing with the same problem the waterfall model aims to solve. In the same way the waterfall method uses extensive planning to not waste time in implementation stage, Agile opts not to produce an extensive design and architecture up front (Hans van Vliet, 2007, p.51). As Hans van Vliet describes “After all, it does not make sense to spend much effort on design if you know this will quite likely be a waste of time. It is more effective to only do the design as far as needed for the immediate next step.” (2007, p.51).

Since this software development project is an individual one and the waterfall method appears more suitable.

Despite the fact that agile is more adaptable to change and promises better productivity. As James Shore and Shane Warden argues “I don’t recommend adopting agile development solely to increase productivity. Its benefits—even the ability to release software more frequently—come from working differently, not from working faster.” (2008, p. 3). As it is important to access if agile is appropriate each project, as it may not always be the best suited approach (Shore & Warden, 2008, p. 3). Agile projects are more suitable for group projects as they help monitor progress and help organise a group. Since this project is an individual one there is less need for agile methods. Also since this is an academic project

Conclusion

**Chapter 3: Requirements analysis and specification (7.5 pages)**

This chapter should explain and justify the process by which the requirements have been elicited. It should then also clearly identify the requirements of your project, which can be later tested. Depending on the chosen development strategy this chapter may be written retrospectively. The student’s academic supervisor will provide additional advice on this where required. The following are some of the details which would be expected in this chapter:

* A clear and precisely defined data model
* A complete set of function definitions
* Details of error conditions

**Chapter 4: Design (7.5 pages)**

This chapter should describe, illustrate and justify the design of your proposed system. This should normally have two parts:

1. User Interface Design

2. Software System Design: the system should be decomposed into components with the interfaces between components and the role of each component described. A clear correlation should exist between your design and your specification.

**Chapter 5: Implementation (7.5 pages)**

The methodology used in the development of the proposed project has to be clearly described in this chapter with a description of the main functions of the software. It should include:

\* A precise specification of the most significant aspects of the systems implementation. This may include detailed descriptions of the implementation of important components, functions or algorithms.

\* Specification and justification of the testing strategies employed

In keeping with the principle of making the dissertation as readable and fluent as possible, it is not necessary to present all of the detailed program code in the main text. Some illustrative examples of the most significant sections of code would suffice. The remainder of the program code can be presented as a listing in one of the appendices. The program listing must be appropriately annotated with comments and each component should have a complete module header. Programs should be written in a clear style with good program structure and well-defined data structures. The program code should reflect its design.

**Chapter 6: Evaluation and Conclusion (7.5 pages)**

The evaluation chapter should demonstrate that the student understands the process of evaluation and testing in Software Development and can relate this to the project being developed. This section should include a general evaluation of the success of the project measured against the criteria stated in the introduction and/or requirements. An evaluation of the hardware/software environment and language used may also be presented. Suggestions for further work should also be discussed. Do not be afraid to be critical or to draw a negative conclusion; not all projects will be successful. This section should provide a thorough and honest reflection on the process followed in the project and the results of that process. To do this well, the student should not leave any blind spots in their reflection and should identify the most and least successful aspects of the project.

Conclusion chapter (have questionnaires which determine how effective the program was).

**References/Bibliography (p.1)**

<http://eds.b.ebscohost.com.queens.ezp1.qub.ac.uk/eds/detail/detail?sid=b41bcbf7-1e33-42b5-a25a-7c2124829cfc@sessionmgr112&vid=1&hid=111&bdata=JnNpdGU9ZWRzLWxpdmUmc2NvcGU9c2l0ZQ==#AN=467476&db=edsebk>

<file:///C:/Users/User/Downloads/BMA%20Developing%20General%20Practice%20report%20v2.pdf>

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Software Engineering:

Principles and Practice (Third

Edition) by Hans van Vliet

**The art of agile development / James Shore and Shane Warden**

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**Appendices (0)**

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Rules

50 pages