**APPRENTICESHIP COURSE WORK**

**Requirements Engineering and Management**

1. **INTRODUCTION**
   1. **Project Background: -**The ongoing project within University Hospital Plymouth NHS Trust is the preparation for the introduction of Electronic Patient Records (EPRs) that would aim to replace a significant number of current systems in the Hospital that are outdated, and inefficient. Patients are getting delayed and stay longer in the hospital than they may need to. Clinicians are getting increasingly frustrated with a huge number of systems and streamlining patient pathways. The old system is cluttered, and the response time is not fast enough. This includes the efficient sharing of patient details such as previous/ current treatments, and medications with other hospitals So, we need a new system replacement preferably electronic.

The new system will also allow the hospital to maximise a ‘virtual ward’ project to help safely facilitate discharges, reducing additional hospital visits by complex patients. This project is a result of legislation that was passed by the government in 2014 by the then Health Secretary Jeremy Hunt who asked NHS England to transition to a more digitalised patient management system that would be accessible to clinicians all over the Country whenever a patient is undergoing treatment, no matter the location.

In England, there is no known legislation governing Electronic Health Records (EHRs) or Electronic Patient Records (EPRs) specifically. There are legislations and regulations about health and medical practice that make references to medical records (both paper and computerised/electronic forms). There are however a few legislative provisions that apply specifically to electronic medium that dictates the type of IT systems that General Practice (GPs) can use in their practice or legislation about ePrescribing. GP and hospital records contain all relevant information relating to the patient's treatment and journey through the acute care pathway. Also, the National Health Service (NHS) introduced Summary Care Records (SCR) nationally in 2008 and it is used to store read-only PDF files on a central NHS computer called the NHS spine and is accessed nationally based on strict access control measures by authorised healthcare staff.

The government launched the development of the National Programme for Information Technology (NPfIT) NHS Care Records Service in 2002, which was intended to deliver an electronic health records system to help manage patient records from across the UK. There were problems with poor user requirement analysis, the failure to address patient confidentiality, overambitious timescales, and enormous cost overruns. A total of 189 NHS Trusts have now introduced new Electronic Patient Records(EPR), the government gave the deadline of December 2023 in the [Plan for Digital Health and Social Care](https://www.gov.uk/government/publications/a-plan-for-digital-health-and-social-care/a-plan-for-digital-health-and-social-care) which was published on the **29th of June 2022**.

NHS England is investing £ 1.9 billion to support hospital trusts to either adopt a new or improve their existing systems to ensure every hospital in England can benefit from digital transformation. Last year NHS England spent over £400 million to support 150 NHS trusts, and a further £500 million will reach trusts this year and University Hospitals Plymouth NHS trust will be one of them.

90% of NHS trusts were expected to have implemented Electronic Patient Records (EPR) by December 2023 and 100% by March 2025. Also, 80% of the Care Quality Commission (CQC) registered adult care providers with digital care records by March 2024 and ensure all health and social care settings have the right infrastructure and connectivity to work digitally. Increased cyber security capabilities, resilience, clinical safety, and accessibility.

The Government introduced The Health and Care Act which introduced significant reforms to the organisation and delivery of health and care services in England and received royal Assent in April 2022. The main purpose of the Health Care Act is to establish a legislative framework that supports collaborations and partnerships working to integrate services for patients. Among a wide range of measures, the Act also includes targeted changes to public health, and social care and the oversight of quality and safety. At the heart of the changes brought about by introducing the new Act is the formalisation of Integrated Care Systems (ICSs).

ICSs are partnerships that bring providers and commissioners of various NHS services across a geographical area together with local authorities and other local partners to collectively plan health and care services to meet the needs of the local population and that includes the creation of Integrated Care Board (ICB) and Integrated Care Partnership (ICP). After a rigorous process The University Hospitals Plymouth NHS Trust is teaming up with Torbay NHS Trust and Royal Devon & Exeter Hospitals NHS Trust to secure the Electronic Patient Records (EPR) called “**EPIC**” because most of our patients and service users are from the catchment areas of Devon, and Cornwall. But Cornwall is procuring a different Electronic Patient Record (EPR) which is called “**CERNER**” and we are in talks with our preferred provider “**EPIC**” to see if the systems will be able to talk to each other to avoid or limit the involvement of paperwork or printing of patient confidential documentation and it being misplaced while in transit. The system will be fully integrated with all the various dashboards that make work life easier for all the staff and stakeholders.

The entire Trust would have to undergo a lot of changes, including cultural (ways of working) and enhancements in preparation for the new system that would be coming in the next couple of years (2026). The preparation kicked off with the upgrade and design of the brand-new process models using process mapping to capture current states (As is) so that the procurement team and the business case team can have something to show when showing the providers to go with. In our case, there were over a dozen providers who were coming to pitch to our Trust what their service would look like what they could do and how the new system would integrate our existing systems into the new preferred system.

The change would also include the overhaul of the entire Trust computer systems, hardware capable of dealing with the software efficiently, and digitalised printers that match the new process. These changes will not only be carried out at our main site, but they will also be extended to our community levels which in this case are (**Tavistock Community Hospital, South Hams Community Hospital, and Mount Gould Hospital**) which are all under our management and umbrella.

**1.2 Business Goals/ Objectives: -** The benefit of the new system is that it would bring more visibility to the various stakeholders (Patients, Consultants, Nurses, Junior Doctors, and clinicians) by making work easy and more streamlined patient information down to the most required and making it much more efficient to manage and help the staff to handle workloads and patient appointments/pathways more effectively. This information, collected for all patients, can be used to provide better and more targeted healthcare for the individual, and collectively to provide the data needed to deliver care more efficiently and effectively to the population and to assist in creating new treatments and techniques. This includes the patient being able to have more information at their fingertips to manage their own care proactively. The new system will help the various stakeholders (consultants, Junior Doctors, Nurses, Matrons, Clinicians, and various clinical staff) to manage patient prescriptions, X-rays, Scans, and blood/urine test requests all in one system.

* 1. **Benefits/ Rationale: -** Electronic Patient Records (EPR) have become a major part of healthcare IT today. The approach to EPRs is likely the biggest technology decision my trust (University Hospitals Plymouth NHS Trust) has taken, and it has been in the planning stages for the past 6 years. It’s a huge investment that comes with consequences that will last for decades and going live is just a start. Some of the aims of electronic Patient Records (EPR) within my NHS Trust would include the following.

This new system will also our staff to manage patient pathways/treatments and visits more effectively to the site or virtually that need to be scheduled as well as surgeries. This will streamline the processes for patients, but also for the clinicians, Consultants and Nursing team.

I wanted to just briefly talk about how this will springboard our administrative pathway waiting list and referral functionality which runs in the background and tracks the patients against their target due dates. This makes it very convenient and easy to make sure that we're not missing those patients and that we're getting them scheduled in a timely fashion, as well as meeting government targets.

Electronic patient records (EPRs) will give clinicians and various medical staff access to vital patient information when and where they need it, alerting them to immediate risks and giving them more time to care for their patients promptly. This will help our trust to change the way we operate and allow for the use of more advanced technology systems for patient care while enhancing productivity and experience for staff members, as well as improving the flow of information between services, which in turn makes it easier to provide care.

**COVID-19** has shown that having digital and data tools at the NHS's disposal can be as important as having the right medicines. Whether through underpinning the initial operational planning, clinical research into treatments, and then the rapid, highly targeted NHS **COVID-19** vaccine rollout, data and digital technology have played a central, but largely hidden role in how the NHS has responded to the biggest public health threats.

**Supporting Independent Healthy Lives: -** Enhanced national digital channels will give patients and people more control over their lives. They will be able to interact easily with different health and social care providers, and access more resources for meeting their health and care needs when and where they choose. The digital transformation that focuses on building trust with people and their families will enhance but not entirely replace the health and social care systems. And for those who cannot access digital services, the traditional service of paperwork will still be available to them.

* **For patient:**

1. enhances individuals' experiences by removing the need for them to constantly provide the same information to multiple health and care professionals, with the risk of forgetting anything vital.
2. increases productivity by eliminating the need for unnecessary, repetitive tests.
3. enhances safety and experience by making comprehensive and trustworthy allergy, medication, diagnostic, and social context information available in all health and care settings, such as A&E or when an ambulance is summoned.
4. provides individuals with access to shared healthcare records, which promotes citizens' engagement and being proactive in their treatment and adherence to medication and care plans.
5. Putting NHS services in people’s pockets through digital channels by increasing the functionality of the NHS App and website to offer features that help patients stay well, get well, and manage their health.
6. Scaling digital health self-help, diagnostics, and therapies.

* **For clinical:**

1. enhances health and care professionals' comprehension of a patient's condition, allowing clinicians to create a tailored treatment plan if necessary.
2. may reduce unnecessary hospital admissions or encourage more appropriate hospital admissions by providing health and care workers with more information about the individual when making clinical decisions.
3. Save time by eliminating the need to request information manually.

* **Service providers and commissioners:**

1. Avoid redundant examinations or assessments, which saves money.
2. improves adult and child safety by exchanging alarms across numerous care settings.

* **Overall Benefits: -**

1. The services will be covering a lot of miles across Devon.
2. Patients can visit more hospitals with ease which includes community hospitals or community or specialist care.
3. This will be no repeat of data to the different staff members.
4. The same system will help us to mitigate the rurality of our local area through enhanced clinical sharing and virtual clinical input for example a shared patient record means that somebody who lives in X area could have a medication review with a consultant in big city remotely saving them a long journey and improving their experience of our services.
5. Up-to-date information on a range of devices.
6. Faster pace to build the EPR system and lower cost.
7. Benefits for patients’ outcomes and safety will be achieved sooner with this sharing of knowledge and insights.
8. Cost saving (reduced payments due to the reduction of multiple systems with the introduction of one system) as well as opportunities for shared IT services.
9. No need to have different EPR knowledge for staff – consistent ways of working.
10. Exploring oversight options with NHS England and the Care Quality Commission (CQC) which will aim to signal to the health and social care sector that digitalisation is a priority.
11. Identify the essential, non-negotiable standards of digital capability and explain how we will monitor and support compliance where appropriate.

* **Overall challenges: -**

1. The effect will be increased when the system is to be shared across two or more organisations. We need to have a proper Executive and project co-ordination/sign-off.
2. Engagement of the organisation - Implementing an EPR system is a significant transformation initiative. Behavioural change is required for clinical transformation. Organisational involvement is required for clinical and operational leaders to take ownership of the change and allow employees to participate in shaping it. When two or more Trusts are involved, everything becomes more complicated.
3. Information governance is putting in place the proper agreements to allow personnel to access and support a system that stores information on patients who have received care from both institutions. Data sharing and data processing agreements may be included. Patients may not expect their data to be shared across two trusts, thus steps must be taken to engage patients and communicate this. GDPR (General Data Protection Regulation) needs to be considered.

* **Lessons learned by the organisation.**

1. Determine additional expenses - there are significant savings, but there are some additional costs. When the new trust joins, the trust that is already on the EPR will have to re-test all its interfaces. Determine the costs and how the two trusts will share them.
2. Manage the change control process - a decision must be made about when the new trust should be included in the process of managing what modifications are made to the EPR and the impact on this. Can it be configured locally, or will there be a knock effect if it is a national change? The quickest method for a new trust to get the benefits is understanding the business and the gap of moving from ‘As Is’ to ‘To be’. Other factors will be discussed with the supplier and national changes can be made on the supplier’s roadmap.
3. Begin data migration work with a third-party supplier as soon as possible - transferring patient data into a system that is already in use necessitates extreme caution. Begin as soon as possible. Also, it could not be done in-house Use a third-party source with the necessary tools and knowledge.
4. Testing the system before go live.
5. Baselining – how the business works, but against each of the benefits expected from the project e.g. patient length of stay being reduced due to better visibility of patient information.

* **Benefits/ Rationale to Maternity Pathway: -** The new electronic Patient Records (EPR) For the care of patients, we can also monitor and track the on-time targets or the potential or the potential for breaches. This will give Clinicians and the nursing team quick access to the PTL report where I can track and manage all the active pathways. So reporting is key and being able to track and monitor can save our staff time because they do not have to re-enter this information in a separate PAS (Patient Administration System). Work cues are the basis for a lot of the follow-up care that needs to happen, whether that's a referral to a new speciality or a waiting list that needs to be booked.

The hope is we may be able to allow the patient to do some of their scheduling, especially in those cases where there might be additional things the patient needs to answer. So, we could group this by location and if we are collecting geolocation information, we can even display that here on how far away it is from the patient's home. Doing that calculation automatically We can see the patient instructions. We will also have access to that original order or request and any questions, comments or scheduling instructions that were filled out by the Clinician/consultant. A good example of this would be for plain film X-rays, requested by GPs. We can open up these types of appointments, as they are not seeing a clinician, they are just having the test. They can choose the location (we have multiple) and time appropriate for them and this would also reduce the number of administration staff needed to book the appointments. This should also reduce DNAs (Did not attend).

Below is another example of another dashboard where we would be able to track and manage things like the individual pathways and look at those breaches and long waiters.

Here we can manage our referrals and authorisations so that all the referrals that are waiting for triage are in this list and enable us to track and monitor the progress of the staff doing the triage. This will allow us to know those on the waiting lists for outpatient visits, as well as inpatient surgeries that need to be scheduled. The waiting list again is configurable on which waiting lists appear in which work list, so you can assign this out to different secretaries. This will allow us to modify and update the columns within the displays, making it easy to track, sort, and in some cases even philtre on some of the different information.

* **Benefits/ Rationale to Urgent Care and Emergency: -**

The new electronic Patient Records (EPR) will allow us to monitor real-time patients coming from emergency patients coming from those operating theatres as well as other direct admissions for patients who are coming in for their appointments. This could even include community facilities rehab or skilled nursing facilities. Part of the responsibilities of the new Electronic Patient Records (EPR) is managing our bed assignments across our hospitals.

**1.4 Stakeholders: -** Below is the list of various stakeholders with whom I will be interacting on the project along with elicitation techniques.

|  |  |  |
| --- | --- | --- |
| **Stakeholder** | **Role** | **Elicitation Technique** |
| Consultants | Clinician | Interview |
| Matrons | Patient Care | Workshop |
| Administrative Staff | Secretaries | Teams Meeting/ Road Shows |
| Porters | Patient movement | Interviews/ Road Shows |
| Anaesthetics | Patient Care | Interview/Shadowing |
| Pharmacist | Patient Medication dispensing | Meetings/ Shadowing |
| Bed Managers | Patient bed allocations | Interviews/ Shadowing |
| Senior Nurses | Ward managers | Interview/Shadowing |
| Midwives | Maternity Team | Interview |
| Discharge Case Managers | Patient Discharge Journey | Interview/ Shadowing |
| Radiographers | Sonographers | Interview/ Shadowing |
| Community Mental Health Team | Mental Health Nurse | Interview/ Teams Meeting |

* 1. **Constraints: -** University Hospitals Plymouth NHS Trust have over one hundred (100) clinical IT systems which consist of 30 core clinical systems and a further 70 other bespoke systems and they don’t integrate well with each other or with our regional and local partners which makes us heavily reliant on paper notes. It is difficult to share information, deliver integrated care, or transform care. Our IT infrastructure is ageing and needs constant investment and improvement to help maintain it. The digital knowledge of our clinical and operational staff is evolving and increasing, and we need to match this with the systems that we use as a Trust to enable the very best ways of working and better decision-making. The EPR IT system is co-designed by clinical staff which includes Doctors, Nurses, Midwives, Pharmacists, and allied health professionals to make sure it meets the needs of those who will use it. And bring real benefits to their patients in preparation for the new Electronic Patient Record (EPR) I was designated to design a business process model that captures patients' entire journey from point of admission to discharge in preparation for when the procurement team would be going out in search of the right product. I will be presenting my design to various stakeholders on the 29th of January 2024, and this will be for them to make any vital observations and amendments if any before I hand it over to the procurement team.
  2. **Dependencies: -** The entire trust will depend on one centralised system that will make life easier and also incorporate some of the vital in-house systems into the final product.

The system will be built to the specifications and requirements of the University Hospitals Plymouth NHS trust. We have in-house systems such as SeeEHR, EDischarge, Electronic Prescribing Medicine Administration (EPMA), and to list a few.

We will be looking for a system that all systems both in-house and the community can depend/rely upon for patient care, as we have over 50 thousand patients across Plymouth, Cornwall and Exeter axis who rely on our services for their healthcare treatments.

**2. REQUIREMENT:**

The new system will help the trust handle complex situations in terms of business processes, patient care and how patient treatments are carried out to guarantee patient safety and security. The new system will require new roles to be created along the way to accommodate the workloads that the new system would bring with it. The roles will include a lot of System Analysis, Information Analysis, Data Analysis and Change Analysis to help manage the information and patient data that will be collated when the new system is in place.

**2.1 In Scope: -** The new system will bring a huge change to the way we as an NHS Trust operate and how we look after our patients who are in our care with various types of healthcare needs. That is why I was tasked with capturing the current business process models (Current State or As Is) within the process map design of the various service lines and how they carry out their daily tasks so that we don’t leave anything unattended or captured before meeting with the preferred supplier. This process was not that straightforward because most of the stakeholders were not forthcoming with what their expectations were from the new system, which made it a bit difficult to understand what to capture in the process map and what should be left out. After a lot of rigorous pain and painstaking deliberations, we came to a consensus about the way all the needed modules would be captured in the final process modelling of the process mapping to keep all the various stakeholders happy with the final product.

* + Hospital at Night
  + Booking Centres Monitoring
  + Electronic Alert System
  + Pottering management and tracking
  + Easy Information Access
  + Medicine to take home monitoring tracker.

The process mapping was the most difficult part of the data collation process in preparation for the new system. The reason is that there are a lot of different service lines across the NHS trust to meet with and discuss their expectation regarding the design of the new **Electronic Patient Records (EPR).**

**2.2 Out of Scope: -** The business case for the new system has been drafted and is in the final stages of approval all the current business models (Current State) have been designed and presented to the various stakeholders and all corrections carried out and final versions signed-off by stakeholders. Then we realised that something was missing in the system that was not included in the original pitch. Still, we as an NHS Trust thought it would help us handle our cancer treatments and help us improve our cancer patient treatment experience **Oncology** module would attract extra funding that we didn’t plan for, which would run into 100 million of pounds. So right now, we are back to the drawing board to try and find extra funding to accommodate the module we desperately need to make life and work easier for our patients and service users and, for the various stakeholders to be able to carry out their duties perfectly well and accurately. Then looking back, we don’t want to purchase a product or system that doesn’t address all our concerns when it comes to patient journey and care, I have been tasked with picking up the designing of the current **Oncology** process model(As Is) and also meet with all stakeholders to have their input into the design process and also take on their contributions to the final design process and sign-off.

Below is the process model (Current State or As Is) captured in the Process map using Microsoft Visio.



**Oncology Cancer Inpatient Treatment Pathway**

**3. REQUIREMENT ELICITATION:**

**3.1 Elicitation Techniques: -** When conducting elicitation techniques various techniques can be useful, such as workshops, Brainstorming, Observation, and interviews.

|  |  |  |
| --- | --- | --- |
|  | **Advantages** | **Disadvantages** |
| **Observation**: By observation, we mean to look at the requirements for the developing system with full concentration | * It provides varieties to the stockholders[a]. * It provides us with the detailed information about the developing system[z] * How the user will interact with the system, so it gives this type of results in advance. | * The requirements may not be up to date. * These requirements always evolve and need revisions. * some requirements may not be implementable and need to be up to the facts and possibilities. |
| **Interviews**: Interviews are in-person meetings where the business analyst asks questions to get information from the stakeholders | * Good for a complex topic * The interviewer can deeply understand the interviewee's views. * In interviews high response rates are produced. | * inconsistent interviewer may affect the data. * This technique is time-consuming. * There are small people involved. * The interviewer may ask closed questions. |
| **Brainstorming:** Brainstorming is the name given to a situation when a group of people meet to generate new ideas around a specific area of interest. | * Brainstorming technique is low cost. * The group involved in this technique, does not need to be highly qualified. * It is a very easy technique to understand. * It helps you to create new ideas and get answers to old questions. * It provides widespread involvement throughout the group. * Brainstorming does not need more resources. | * If the group is not properly organised, it can take more time. * One can’t describe his opinion in front of the group. * Due to go into the detail that something does not use. * Some people are afraid to talk with leadership. * Not good for large groups which may cause some people to say at the same time. * There are repeat of opinions if the people don’t give attention. |
| **Workshops**: Workshops are the technique to share different ideas about different technologies by doing presentations and meeting people from different backgrounds. Collecting valuable feedback suggestions and business opportunities. | * Expanding social network among people from the same background. * Exchanging and sharing up-to-date knowledge. * Exploring new business opportunities. * Attracting investments for the business. * Making new customers. | * It involves travelling to other countries. * It consumes a week of business time. * It demands a lot of preparation and time. |

I conducted meetings with various stakeholders on various occasions by scheduling face-to-face meetings and they were very helpful all through the process from start to finish, by being willing to meet and discuss how the business situation analysis would help with clinical delivery within each ward. They contributed to the design and development of the new process systems. The stakeholders/stockholders have supported me with all projects reviewing all the business modelling designs and making corrections and meetings to discuss the future state of the business models. I wouldn’t be able to finish my projects without input from stakeholders. They are the end users of the finished project so they must have a say in the design until the rollout, as our job is to make sure they are looked after and satisfied with the product.

I had to set up meetings with all the stakeholders/stockholders (Senior Nursing staff, Consultants, Clinicians, Medical directors, and Matrons) to discuss what is expected in the system. I ask questions about the changes that need to be carried out in the new system to address them by collecting all the information, and data that would help me build and design the target state (Future State) and then compare both information and note the changes that this would address while also identifying the gaps that would be addressed.

The stakeholders' engagement (Nursing staff, ward Managers and clinicians) was very instrumental to my being able to carry out the design of the process modelling. The wards and clinical staff would rely more on this new system to help them understand and treat their patient better. I had to go to the wards to observe how things were done and ask questions about what to expect from the new centralised system.

I had to conduct individual and group interviews with ward staff and stakeholders to try and understand what is expected in the new system. I visited wards to spend a day with the ward Nurses to observe how things are done and how the new system would help consultants and clinicians manage their patients and workload effectively. The table below shows the list of all the stakeholders I met with on various occasions.

Below is the list of key stakeholders that I will be engaging with during this project along with the **Elicitation Techniques** that I used to gather my requirements from them: -

|  |  |  |
| --- | --- | --- |
| **Stakeholder** | **Role** | **Elicitation Technique** |
| Consultants | Clinician | Interview |
| Matrons | Patient Care | Workshop |
| Administrative Staff | Secretaries | Teams Meeting/ Road Shows |
| Porters | Patient movement | Interviews/ Road Shows |
| Anaesthetics | Patient Care | Interview/Shadowing |
| Pharmacist | Patient Medication dispensing | Meetings/ Shadowing |
| Bed Managers | Patient bed allocations | Interviews/ Shadowing |
| Senior Nurses | Ward managers | Interview/Shadowing |
| Midwives | Maternity Team | Interview |
| Discharge Case Managers | Patient Discharge Journey | Interview/ Shadowing |
| Radiographers | Sonographers | Interview/ Shadowing |
| Community Mental Health Team | Mental Health Nurse | Interview/ Teams Meeting |

Meeting with some of the main stakeholders I conducted via Microsoft Teams because most, if not all the stakeholders/stockholders had busy schedules that conflicted with each other. So, after a lot of consultations and agreement between the various parties, I agreed with most of them to conduct this virtually and it was a success which gave me a wonderful result to work with and produce a great dividend. The Consultants, Clinicians and medical staff were helpful and forthcoming with wonderful ideas on what to include and how to make the system work better for every stakeholder to enjoy.

The Community Nursing team was the hardest to track down because they are always very busy attending to the community needs, the only way we could make sure they had input in the process was to conduct meetings virtually. The emergency staff also were forthcoming with great ideas after looking through the process map.

A screenshot of a computer

Description automatically generated

**Meeting correspondence with one of the major stakeholders**

The validation process included sending process maps to stakeholders and setting up meetings with individual stakeholders on a one-to-one basis to try and picture what their concerns are about the functionality of the system. Also, make sure their concerns are captured in the final version of the process.

A screenshot of a computer

Description automatically generated

**Meeting requests to some of the stakeholders**

A screenshot of a computer screen

Description automatically generated

**Stakeholders Engagement Meeting**

A screenshot of a video conference

Description automatically generated

**Stakeholders Engagement Workshop**

**3.2 The Front-end Interface:** When designing the mock-up of the front-end I engaged with various stakeholders/stockholders and talked about how we can accommodate and make the portal accessible to a variety of our service users and staff members with various health issues and challenges such as physically, earing, and virtually impaired to be able to use the system as well and interact with through various buttons, text boxes, images, navigation menus and list boxes and voice recognition service on the home page. When it was time to discuss our expectations of the new system with the preferred supplier, all these points were made known to them. It is very important to our Trust to make provisions and accommodate all manner of users across the entire platform because our service users, patients and staff members are our number one priority as a healthcare provider. As healthcare providers/organisations, we need to accept and treat everyone who uses our services equally.

**3.3 Functional Requirements: -** This can be defined as the desired operations of a program or system in software development and systems engineering. The systems in system engineering can be either software electronic hardware or a combination of software-driven electronics. Functional requirements can also be referred to as part of requirements analysis (also known as requirement engineering), which is an interdisciplinary field of engineering that concerns the design and maintenance of complex systems. During the requirement elicitation, I made it very clear that I was gathering requirements, not solutions. The reason for this approach is that stakeholders would not necessarily agree on the functionalities that may be into the new system may have.

When gathering the requirements during the workshops I ensured that I was gathering clear requirements and some stakeholders insisted on a particular solution. However, I refrained from that because if you drive a particular solution forward, it may not cover all the requirements. For example, some of the solutions were conflicting and overlapped with each other i.e. some stakeholders in the Theatres wanted where they could monitor and dispense medications according to patient needs and not waste and I made it clear that this has already been addressed in the Inpatient design face which will be replicated across the board as a standard requirement for the final product. Even at that, I had to set up a meeting with all the stakeholders in one place to try and address their concerns and come to a consensus so that we can move forward together as a unit and a trust that is working towards the same goals in terms of our expectations concerning the **Electronic Patient Records (EPR).**

However, I made sure the requirements were clear and very easy for the various stakeholders to follow and also there were no ambiguous conflicting requirements i.e. wanting to have control of who they can admit to the Emergency Theatre for a procedure to was not visible and a lack of clarity on what was meant to go into the new system so I set up meetings with the top Theatre stakeholders to discuss where improvement can be made and there were disagreements with what should be included in the final process mapping which was not clarified and I had to set up a meeting with all the stakeholders involved so that we can come to an understanding and agreement on a way forward.

**3.4 Prioritisation Approach: -** During the requirement of the session process I utilised the prioritisation approach **MoSCow** which is also MoSCow analysis is a popular prioritisation technique for managing requirements. The acronym MoSCoW represents four (4) categories of initiatives which are Must-have, should–have, could-have, won’t-have, or will not have right now. The “W” can also mean “Wish”. As the diagram below explains

**A few different colored labels

Description automatically generated with medium confidence**

**(T, 2023)**

The reason I used the MoSCoW framework is that it has been defined in a way that allows the delivery of minimum usable requirements to be guaranteed. It is regarded as the most popular prioritisation technique for managing project requirements and also helps to contextualise the value of the task or future of the project. And provides a way to categorise users' requirements based on their priorities. It also helps develop a clear understanding of the Must Have, Should Have and Could Have categories while constraining the number of Must Have to those that could be completed within budget at a level of certainty chosen by the Trust.

**A diagram of a diagram of a mixture of different types of objects

Description automatically generated with medium confidence**

**MoSCoW rules at play: a) During planning, b) in execution**

**3.5 Non-Functional Requirements: -** This can be defined as a set of specifications that describe the system’s operation capabilities and constraints. These are the requirements that outline how well the system operates, which can include things like speed, security, reliability, and data integrity. Though the system will still work as expected, it won’t address all the stakeholder's expectations or the needs of the entire system.

Non-functional requirements also help keep functional requirements in check. Attributes that make the product/ system affordable, easy to use, and accessible, come from non-functional requirements.

**Examples of Non-Functional Requirements:**

1. **Performance Requirement:** Performance defines how fast a software system (or its component) responds to certain users’ actions under a certain workload. It’s the core type of nonfunctional requirements no system can do without. In most cases, the performance metric explains how long a user must wait before the target operation happens (the page renders, a transaction is processed, etc.) given the overall number of users at the moment. But it’s not always like that. Performance requirements may describe background processes invisible to users, e.g., backup. But let’s focus on user-centric performance.
2. **Scalability Requirements:** Scalability assesses the highest workloads under which the system will still meet performance and usability requirements. Importantly, scalability refers to the capacity of the system to handle growth in terms of both data volume and user load.
3. **Portability Requirements:** Portability determines if a system or its elements can work in different environments. It usually includes hardware, software, or other usage platform specifications. In other words, it establishes how well actions performed via one platform are run on another. Also, it prescribes how well system elements may be accessed and may interact from two different environments.
4. **Compatibility Requirements:** Compatibility defines how a system can coexist and interact with another system in the same environment. In other words, these requirements specify how *compatible* the software product is with other programs. For instance, software installed on an operating system must be compatible with its firewall or antivirus protection. A lack of compatibility can lead to poor performance, errors, or data loss.
5. **Reliability Requirements:** Reliability specifies how likely the system, or its element would run without a failure for a given period under predefined conditions. Traditionally, this probability is expressed in percentages. For instance, if the system has 85 per cent reliability for a month, this means that during this month, under normal usage conditions, there’s an 85 per cent chance that the system won’t experience critical failure.
6. **Maintainability Requirements:** Maintainability defines the time needed for a solution or its component to be fixed, changed to increase performance or other qualities, or adapted to a changing environment.
7. **Availability Requirement:** Availability describes how likely the system is accessible to a user at a given point in time. While it can be expressed as an expected percentage of successful requests, you may also define it as a percentage of time the system is accessible for operation during some period. For instance, the system may be available 98 per cent of the time during a month.
8. **Security Requirements:** So, the nonfunctional requirements part will set up specific types of threats that functional requirements will address in more detail. But this isn’t always the case. If your security relies on specific standards and encryption methods, these standards don’t directly describe the behaviour of a system but rather help engineers with implementation guides.

**(engineering, 2023)**

**4. FUNCTIONAL REQUIREMENTS: -**

**4.1 Priority: -** The main priority of the new **Electronic Patient Records (EPR)** is to address the shortcomings of the current system that is in place within the trust and make maximum use of the opportunity to change and include some new ideas and new ways of doing thing into the new system.

|  |  |  |
| --- | --- | --- |
| **M** | Must have | * **Improving flow and capacity:** EPR indicates to ward staff the type of bed clean based on the departing patient's clinical status- improving patient flow, bed capacity and efficiency across our wards. Real-time bed status information is available allowing for the management of high occupancy areas and planning of upcoming patient discharges. * **Hospital at Night:** Hospital at Night allows ward nurses to request jobs overnight or out of hours to a central point of access, coordinating clinical action In Basket is the EPR’s message-based task management system, which our clinicians use to streamline communication and coordinate clinical action across the trust with instant communication using the Electronic Patient Records secure messaging system. * **Improved antenatal and postnatal support:** Time-saving and beneficial for patient care as well as easier for staff. * **Booking centre:** The central booking office is now much more streamlined. EPR benefits the patients and the hospital. * **Rapid access to information:** EPR will allow staff to quickly access all of the patient's health records on one system (crucial for efficient emergency care). |
| **S** | Should have | * **Medicine take-home improvements:** EPR has improved the process for creating and writing medicine orders. Helping speed up the discharge process. * **Pottering on the go:** The 'Rover' device helps with allocating porters to their next job. Porters will not be held back waiting for paperwork due to EPR, Virtual wards: providing care on the go and a general overview of the wards, and frailty success and ward overview and reduce the risk of infection by tracking every step of the patient care/journey. Medical devices directly connected to EPR automatically and continuously recorded directly into that patient's health record on EPR. * **Electronic alerts:** Frequent ED attender and attendees with an emergency plan. |
| **C** | Could have | * **Fast Pass success:** Fast Pass allows patients to request an earlier appointment on **MyFrimleyHealth Record** when cancellations or rebooking become available. Recording care at the bedside using mobile devices. * Medical devices directly connected to EPR automatically and continuously recorded directly into that patient's health record on EPR. * **Smartcards**: Use of smartcards synced to NHS Spine to automatically pull nationally held information about a patient into our EPR system. * **Virtual Fracture Clinic:** Help with service demand and improve patient care and experience. |
| **W** | Want to have/  Will not have this time | * **Clinical letter dictation:** Dragon Medical One (DMO), a state-of-the-art voice recognition system that converts voice to text directly in EPR. (The speed of patients receiving their letters is faster). |

**4.2 Requirement: -** These is the system requirements that very essential and must, should and could be included in the new system. The table gives a suggestive list that we have given to the system supplier to make sure that the system meets the entire specifications that would last more than a decade:

Below are examples of some of the requirements:

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Requirement** | **Related**  **Non-Functional Requirement** | **Priority** |
| **FR-#TTAs** | EPR has improved the process for creating and writing medicine orders. Helping speed up the discharge process | NFR## | M |
| **FR-#HaN** | Hospital at Night allows ward nurses to request jobs overnight or out of hours to a central point of access, coordinating clinical action In Basket is the EPR’s message-based task management system, which our clinicians use to streamline communication and coordinate clinical action across the trust with instant communication using the Electronic Patient Records secure messaging system | In Basket is the EPR’s message-based task management system, which our clinicians use to streamline communication and coordinate clinical action across the trust. | S |
| **FR**  **#FP** | Fast Pass allows patients to request an earlier appointment on **MyFrimleyHealth Record** when cancellations or rebooking become available. | The central booking office is now much more streamlined. EPR benefits the patients and the hospital. | C |
|  | EPR indicates to ward staff the type of bed clean based on the departing patient's clinical status- improving patient flow, bed capacity and efficiency across our wards. Real-time bed status information is available allowing for the management of high occupancy areas and planning of upcoming patient discharges. | Improved communication between the patient and all staff involved. Improved pathways between teams and accountability for complex cases. Accessible app for patients known as MyFrimleyHealth Record. Able to message the midwifery team on the app. |  |
|  | BCMA- ensuring that the right medications and the right doses are given to the right patients and that the medication is recorded in the patient’s health record in our electronic patient record system. | Allergy information available on EPR improves safety for our patients. |  |
|  | Secure chat system for porters to relay queries and messages directly to the team coordinators (speeding up the process and not requiring them to go physically and check with the team coordinators) | Benefits of the EPR system on our community site. |  |
|  | In Basket is the EPR’s message-based task management system, which our clinicians use to streamline communication and coordinate clinical action across the trust. | Created a dashboard within EPR to give a complete view of the current bed states across all inpatient areas. |  |

**4.3 User Stories: --** Below are examples of some of the User stories:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ID** | **As a …** | **I want to be able to …** | **in order to …** | **Priority** |
| **NFR**  **#Chat** |  | Have a secure chat for porters to relay queries and messages directly to the team coordinators (speeding up the process and not requiring them to go physically and check with the team coordinators). | Speed up the process and not require them to go physically and check with the team coordinators). | S |
| **NFR**  **#1-2-1** |  | Following the main group discussion, they go straight onto a computer to read the handover and view their patients' records. | A simple handover process that doesn’t take too much time from patient care | M |
|  |  | Self-service kiosks allow patients to check-in to their outpatient appointment themselves  helping receptionstaff during busy periods and easing patient flow in these areas | Nurses use handheld devices called ‘Rover’. Workstations-on-wheels are used primarily by our doctors to record information during ward rounds. |  |
|  |  |  | Medical devices directly connected to EPR automatically and continuously recorded directly into that patient's health record on EPR. |  |
|  |  |  |  |  |

**5. NON-FUNCTIONAL REQUIREMENTS: -** Below are examples of some of the non-functional requirements:

|  |  |  |
| --- | --- | --- |
| **Category** | **ID** | **Requirement** |
| Security | NFR | Data security is, firewall against cyber-attacks that can help prevent any unwanted phishing that may occur. |
| Usability | NFR | How user-friendly is the system and can it work on tablets and smartphones mobile devices to be available 24/7 and |
| Performance | NFR | Response time must be less than 1 minute and autosave of data input while completing a task. |
| Availability |  |  |
| Capacity | NFR | Unlimited cloud storage capacity for the amount of data that will be handled across all the sites. |
| Accessibility |  |  |

1. **REQUIREMENT ANALYSIS, VALIDATION & TRACEABILITY: -**
   1. **Requirements Documentation Approaches: -** We tend to use the Microsoft Workload Planner to list the progress made at every stage of the project, the disadvantage we encounter is I can’t add notes in detail. This is why we as a team also make use of Microsoft Excel to create a table with taps that represent the various stages of the project's progress which makes it easier for us to tick off every stage of the project that has been completed or signed off while also allowing us to add new project or remove completed projects. The disadvantage of using Microsoft Excel is the file can be corrupted and the data/ information stored is lost which can be painful and mentally exhausting.

I believe there are other prominent project management software that can help structure and organise every step/ phase of the project life cycle, such as

**JIRA:** Jira is a software application developed by the Australian software company Atlassian that allows teams to track issues, manage projects, and automate workflows.

|  |  |
| --- | --- |
| **PROS** | **CONS** |
| • Built for Agile and Scrum management • Excellent issue management for bug and issue tracking • Instant ticketing abilities to streamline problem-solving | • Can be complex to use • Collaboration features are extremely limited  • Might not be the best fit for all teams (engineering and software development focused) • Higher barrier to entry • Load times can lag |

One way of documenting project requirements is by using the Microsoft Excel spreadsheet which is our go-to place for project documentation this process helps us make sure all the steps and phases of the project are captured promptly in a spreadsheet with taps that represent all the projects that we are working on and this helps us manage meetings and keep track of all our stakeholders/stockholders engagement meetings. During the project, I trace requirements with the use of a Microsoft Excel Spreadsheet which I designed to keep track of all the modifications and updates that are carried out during the project lifecycle using project ID so that when someone makes some changes I know who the source was and also when a change is to take place on the project I will make sure all the changes are recorded on the checklist to keep a record of all modifications and upgrades. I wanted a situation where if am not in the office or move jobs someone can pick up the spreadsheet look through it and make some changes where needed.

A screenshot of a computer

Description automatically generated

**Project Tracking Checklist the Inpatient Design Phase**

But Excel spreadsheet comes with a lot of pros and cons which I have listed in the table below: -

|  |  |
| --- | --- |
| **ADVANTAGES AND DISADVANTAGES OF USING SPREADSHEETS FOR PROJECT DOCUMENTATION** | |
| **ADVANTAGES** | **DISADVANTAGES** |
| 1. **Familiarity and Ease of Use**  Excel’s widespread adoption in various industries is one of its greatest strengths for project management. Its intuitive interface and familiar functionalities make it an accessible tool for professionals at all skill levels. This ease of use reduces training time and allows teams to focus more on project execution than learning new software.   * **User-Friendly Interface**: Excel’s layout is intuitive, with tools and features easily accessible, making it simple for users to navigate and use. * **Minimal Training Required**: Most professionals have a basic understanding of Excel, reducing the need for extensive training. * **Quick Adaptation**: Teams can quickly adapt to using Excel for project management, thanks to its familiar environment.   2**. Flexibility and Customization:** One of the key strengths of Excel in project management is its remarkable flexibility and capacity for customization. It allows project managers to create a setup that precisely fits their projects’ unique requirements and complexities. This adaptability ensures that Excel can be tailored to meet your specific needs, whether you’re tracking a simple task list or managing a complex project with multiple dependencies.   * **Tailor-Made Solutions**: Excel enables users to design spreadsheets that cater specifically to the demands of their project, whether it’s for tracking milestones, resources, or budgets. * **Adaptability for Various Projects: Its versatility makes it suitable for various** projects, from small-scale plans to large, multi-faceted endeavours. * **Customizable Templates and Formulas**: With various templates and the ability to create custom formulas, Excel provides endless possibilities for personalizing project management approaches.   3. **Cost-Effectiveness:** Excel proves to be a highly cost-effective solution for project management. Many organizations already have Microsoft Office Suite, which includes Excel, eliminating the need for additional investments in specialized software. This affordability makes it particularly appealing for small businesses and startups with limited budgets.   * **No Additional Software Purchase**: Excel is often already part of the existing software suite in many organizations, requiring no extra expenditure. * **Reduces Overhead Costs**: Companies can allocate resources elsewhere by avoiding the costs associated with purchasing and maintaining specialized project management tools. * **Ideal for Budget-Conscious Projects**: Excel’s affordability makes it an excellent choice for projects where keeping overhead low is a priority.   4. **Advanced Data Analysis Capabilities**  Excel’s advanced data analysis capabilities are a significant advantage for project management. It offers a range of features like PivotTables, conditional formatting, and complex statistical functions, enabling managers to analyse project data deeply and make data-driven decisions.   * **Comprehensive Data Analysis Tools**: Features like PivotTables and advanced charting allow for detailed data analysis and visualization. * **Support for Complex Calculations**: Excel can handle complex statistical functions and calculations, which is crucial for data-intensive projects. * **Data-Driven Decision Making**: Analysing trends and patterns empowers managers to make informed decisions based on real-time data.   5. **Integration with Other Microsoft Products:** Excel’s seamless integration with other Microsoft Office applications like Word, PowerPoint, and Outlook enhances its utility in project management. This compatibility allows for efficient data transfer and communication, streamlining various project management processes.   * **Effortless Data Sharing**: Easy import and export of data between Excel and other Microsoft applications facilitate a smoother workflow. * **Unified Communication**: Integration with Outlook allows for efficient communication and scheduling within project teams. * **Enhanced Reporting**: The ability to incorporate Excel data into PowerPoint presentations and Word reports simplifies the creation of comprehensive project documents.   6**. Scalability:** Excel’s capability to handle large datasets makes it a scalable tool for project management. Whether managing a small team or a large enterprise project, Excel can adapt to the increasing complexity and volume of data.   * **Handles Large Volumes of Data**: Excel’s robust framework supports large datasets, which is essential for big projects. * **Flexible for Project Growth**: Excel scales up to accommodate additional data and complexity as projects expand. * **Adaptable for Various Team Sizes**: Excel can be efficiently used by small and large departments, maintaining its effectiveness across different scales.   7. **Real-time Collaboration (with Office 365):** With Office 365, Excel supports real-time collaboration, allowing multiple users to edit the same spreadsheet simultaneously. This feature promotes teamwork and ensures all team members access the most current project data.   * **Simultaneous Editing**: Teams can work on the same document, improving collaboration and efficiency. * **Access from Anywhere**: With cloud-based capabilities, team members can access and update project data from different locations. * **Live Updates**: Real-time updates ensure that all collaborators work with the most recent data, reducing the risk of errors or outdated information.   8**. Robust Reporting Features:** Excel offers robust reporting features that enable project managers to generate comprehensive and visually appealing reports. These reports can track project progress, analyse performance, and communicate effectively with stakeholders.   * **Customizable Reports**: The ability to create tailored reports allows for more effective communication of project status and outcomes. * **Visual Data Representation**: Excel’s charting and graphing capabilities help present data in an easily understandable format. * **Detailed Performance Tracking**: Managers can track project performance against key metrics and timelines, improving project control.   9. **Automation through Macros and VBA:** Excel’s macros and VBA (Visual Basic for Applications) scripting offer automation capabilities, reducing manual effort and increasing efficiency. This feature is handy for repetitive tasks and streamlining project management processes.   * **Time-Saving Automation**: Automate repetitive tasks like data entry and formatting, freeing time for more critical project management activities. * **Custom Scripting Options:**VBA allows the creation of custom scripts and enhances Excel’s functionality to suit specific project needs. * **Error Reduction**: Automation minimizes the risk of human error in repetitive tasks, ensuring higher data accuracy.   10. **Wide Range of Templates and Resources:** Excel’s vast array of templates and online resources make it an even more powerful tool for project management. From Gantt charts to budget trackers, templates are available for almost every aspect of project management. | 1. **Limited Collaboration Capabilities:** One significant disadvantage of using Excel for project management is its limited collaboration capabilities. Consider a marketing team working on a product launch in a real-life scenario. The team uses Excel to manage their project timeline and tasks. However, with team members unable to work on the file simultaneously, updates become challenging, leading to miscommunication and delays. Excel’s lack of real-time collaboration tools means that team members often work with outdated information, resulting in inefficiencies and potential errors. To overcome this, businesses can adopt project management tools that offer real-time collaboration features, allowing team members to work concurrently on the same project ensuring that everyone is always on the same page.  2. **Poor Handling of Large Datasets:** Another major drawback of Excel in project management is its poor handling of large datasets. Imagine a construction project involving hundreds of tasks, resources, and timelines. Using Excel to manage such vast data can be cumbersome and error prone. Excel struggles with performance issues when dealing with large files, leading to slow load times and increased potential for data corruption. Switching to project management software designed to handle large datasets efficiently is advisable to address this. These tools offer robust data processing capabilities, ensuring smooth and reliable management of extensive project data.  3. **Lack of Integrated Project Management Features:** The third disadvantage is the lack of integrated project management features in Excel. For instance, a software development team using Excel cannot effectively track issues or bugs within the same platform where they manage their project timelines. Excel does not offer built-in tools for critical aspects of project management such as issue tracking, risk management, or resource allocation. To resolve this, integrating specialized project management software that includes these essential features can significantly enhance the management process, providing a more holistic and efficient approach to project execution.  4. **Vulnerability to Human Error:** Excel’s vulnerability to human error is another significant disadvantage. When a financial analyst manages budget allocations for a project in Excel, a simple mistake in formula or data entry can lead to substantial financial miscalculations. Excel lacks the advanced error-checking features found in specialized project management tools, making it prone to errors that can have far-reaching implications. Adopting software with built-in error-checking and validation mechanisms can help mitigate these risks, ensuring more accurate and reliable project management.  5. **Limited Visual Project Tracking Tools:** The fifth disadvantage revolves around Excel’s limited visual project tracking capabilities. Excel’s basic charts and graphs provide insufficient visualization for effective tracking for a project manager overseeing a complex project with multiple dependencies and milestones. Excel lacks advanced visual tools like Gantt charts or Kanban boards, making it challenging to get a comprehensive view of the project status. Implementing project management software that offers a range of visualization tools can dramatically improve the tracking and presentation of project progress, facilitating better decision-making and communication.  6. **Absence of Automation Features:** Excel’s lack of automation features is a significant drawback. When a project manager needs to update project status regularly, doing this manually in Excel is time-consuming and prone to errors. Excel does not offer automation capabilities for repetitive tasks like data entry, status updates, or report generation. Adopting project management tools with automation features can save valuable time and reduce the likelihood of errors, allowing project managers to focus on more strategic aspects of their projects.  7. **Inadequate Security for Sensitive Data:** The seventh disadvantage concerns Excel’s inadequate security features for sensitive project data. For example, a healthcare project handling patient data in Excel faces a high risk of data breaches due to Excel’s basic security measures. Excel does not provide robust security features such as user access controls, encryption, or audit trails, essential for managing confidential data. Implementing project management tools with enhanced security features is crucial for protecting sensitive information and ensuring compliance with data protection regulations.  8. **Limited Integration with Other Tools:** A critical limitation of Excel is its inability to integrate seamlessly with other tools and systems. Consider a logistics project that requires integration with external inventory and shipping systems. Excel’s limited integration capabilities make synchronizing data across different platforms challenging, leading to inefficiencies and data discrepancies. Transitioning to project management software with robust integration capabilities with other tools can streamline processes and ensure consistent and accurate data flow across systems.  9. **Limited Scalability for Growing Businesses:** The ninth disadvantage is Excel’s limited scalability. Excel’s capabilities may not scale accordingly as a business grows and its projects become more complex. Excel cannot efficiently manage the increased project size and complexity for a rapidly expanding company. This limitation can hinder the growth and scalability of project management processes. Upgrading to scalable project management software can accommodate the growing needs of a business, ensuring that project management capabilities evolve in line with the company’s growth.  10. **Lack of Dedicated Support and Updates for Project Management:** Lastly, Excel’s lack of dedicated support and updates specific to project management is a notable disadvantage. For instance, a project team encountering issues with Excel will find limited support options tailored to project management needs. Excel does not provide such targeted support, unlike specialized project management software that offers ongoing support and regular updates focused on improving project management functionalities. Opting for project management tools with dedicated support and continuous updates can ensure smoother project execution and access to the latest features and improvements. |

* 1. **Requirement Validation: -** The validation I carried out was done by having workshops across the Trust and inviting staff members to come through with suggestions and feedback on what they think of the idea and the benefits of the new system. I validation process I used was to send the process maps to the service lines for them to review and then get back to me with their preferred date so that I could send out meeting invites through Microsoft Teams so that we could get the stakeholders' views and contributions while encouraging stakeholders' engagement in the process. This allowed me to showcase the process modelling (Process Mapping) diagrams that I designed using Microsoft Visio so that I could get inputs from the stakeholders' concerns. This was an opportunity for me also to understand what their expectations were regarding the new system and how to address it without leaving any vital steps and information out in the final design. Even though it was not an easy task.

A screenshot of a computer

Description automatically generated

**Project tracking checklist for Inpatient**

A screenshot of a computer

Description automatically generated

**Project tracking checklist for Theatre**

* 1. **Requirements Management: -** This can be defined as the process of documenting, analysing, tracing, prioritising, and agreeing on the requirement and then controlling change and communicating to relevant stakeholders. This means for the electronic Patient Records (EPR) project to be successful we must aim to be result-driven. In today’s competitive environment within the Healthcare sector, there is no room for failed projects or stale performance. The goal for University Hospitals NHS Trust is to be successful long term which is becoming more difficult because of the fast global expansion within the Healthcare sector than ever before.

Requirements management keeps all the teams involved in sync with one another and helps provide visibility into what is needed or happening and when it is happening throughout the entire project life cycle. It is also very important for the team to understand what the goal of the project is. **Change Control** or let me say **Uncontrolled changes** can cause many different problems such as additional rework, lack of first-time quality, unpredictable schedule deviation and cost issues. Following a change process can make requirements changes very easily to deal with. The requirement change process must be able to propose, analyse, improve and implement any changes within a requirement during any part of the project. **Traceability-** allows for the University Hospitals NHS Trust to manage the entire life of the project requirement. This will help us understand how traceability helps ensure accurate delivery of the stakeholders' needs and expectations.

The tracing is more related to system development and would help add value to the project. Traceability will help improve the scope management within the project and potentially prevent the team from overseeing an identified requirement. Missed requirements can sometimes lead to huge cost increases if it is implemented late or if there is a slight delay in the implementation stages. This is why T**raceability** can help provide the ability to track the priority of all the requirements and their changes. We know it can be difficult to implement without the right tools or resources we can run into a cost overrun and not worth the benefit we originally assumed. This is why we use Excel spreadsheets to keep track of all the steps and procedures of the project life cycle and make amends as we go along. This in turn gives me a good understanding of where the gaps are so that I can correct them in good time for the final episode of the project.

During the project, I trace requirements with the use of a Microsoft Excel Spreadsheet which I designed to keep track of all the modifications and updates that are carried out during the project lifecycle using project ID so that when someone makes some changes I know who the source was and also when a change is to take place on the project I will make sure all the changes are recorded on the checklist to keep a record of all modifications and upgrades. I wanted a situation where if am not in the office or move jobs someone can pick up the spreadsheet look through it and make some changes where needed.

A screenshot of a computer

Description automatically generated

**Project Tracking Checklist the Inpatient Design Phase**

A screenshot of a computer

Description automatically generated

**Project tracking checklist for Theatre**

Changes to the system or let me say upgrades will be done within the ten-year lifespan of the final project, and this will be managed in phases to limit service disruptions across the Trust and also make sure there is Business as Usual (BAU) while the upgrade is being carried out across all the sites.

I have been involved in the change preparations for the forthcoming system. I know the question everyone will be asking is “**How can you determine the change when the new system has not yet been implemented?”.** I would say you are right to question this because it is too early to determine the changes that may occur, but I am looking into the future and what would be needed to change during the piloting phase rollout. This will be the period to take stock of what is working and what needs to be corrected to have a smooth and easy system that won't fail in a few months. In the preparation stages for the **Electronic Patient Records (EPR),** I plan on taking the step of preparing Microsoft Excel Spreadsheets that will be updated regularly about the changes that we think will happen during the launch and piloting phases of the project. Something similar to my project tracking spreadsheet that I have put a screenshot above.

1. **Benefits Realisation and Management: - When** delivering a project of this nature one thing to consider is the benefits this will bring to the trust and the management process in place to help understand the benefits which are highlighted at the start of the document. The benefit realisation metrics will help us understand all the positives and the negatives which will be managed by a team of benefit realisation experts who will monitor, document and generate reports within the first three (3) months of the go live. The benefits that will come from the implementation of the new system in this case will include the following:

1. **Virtual Fracture Clinic:** This will help with service demand and improve patient care and experience.
2. **Rapid access to information:** EPR will allow staff to quickly access all of the patient's health records on one system (crucial for efficient emergency care).
3. **Electronic alerts:** Frequent ED attender and attendees with an emergency plan.
4. **Smartcards**: Use of smartcards synced to NHS Spine to automatically pull nationally held information about a patient into our EPR system.
5. **Single source of truth:** Since EPR has all the patient information on the system which would also be the most updated information it would be a single source of truth (making it easier for quicker, safer and better care**).**
6. **Real-time information for effective management:** EPR benefits us by providing real-time updated information on the patient through dashboards.
7. **Using digital technology to identify and treat sepsis quicker:** Benefits of EPR on detecting sepsis (early detection and faster response) **Barcode medication administration:** BCMA- ensuring that the right medications and the right doses are given to the right patients and that the medication is recorded in the patient’s health record in our electronic patient record system.
8. **Allergy improvement:** Allergy information available on EPR improves safety for our patients.
9. **Referrals to our community sites:** Benefits the EPR system on our community site. **Smart Tools:** Smart Tools are time-saving shortcuts that our staff can use to pull various information into their documentation.
10. **Automation of vital patient data from medical devices** directly connected to EPR automatically and continuously recorded into that patient's health record on EPR.
11. **Recording care at the bedside using mobile devices:** Nurses use handheld devices called ‘Rover’. Workstations-on-wheels are used primarily by our doctors to record information during ward rounds.
12. **Patients do not stay in the hospital for longer than necessary**: Processes have become faster, discharge summaries are completed within EPR, and doctors can remotely provide care and prescribe medication without needing to be with a patient.
13. **Improving flow and capacity:** EPR indicates to ward staff the type of bed clean based on the departing patient's clinical status- improving patient flow, bed capacity and efficiency across our wards. Real-time bed status information is available to manage high
14. occupancy areas and plan upcoming patient discharges.
15. **Recording care at the bedside:** Wows are moveable devices that allow clinicians to use the EPR while also spending face-to-face time with the patient. This allows for real-time recording of patient information, medication, and demographics.
16. **Making Everyday Matter:** Help our patients at home as safely and quickly as possible. Also able to use 'In Transit' (virtual waiting area).
17. **Patients do not stay in the hospital for longer than necessary:** Processes have become faster, discharge summaries are completed within EPR, and doctors can remotely provide care and prescribe medication without needing to be with a patient.
18. **Improving flow and capacity:** EPR indicates to ward staff the type of bed clean based on the departing patient's clinical status- improving patient flow, bed capacity and efficiency across our wards. Real-time bed status information is available to manage high occupancy areas and plan upcoming patient discharges.
19. **Medicine take-home improvements:** EPR has improved the process for creating and writing medicine orders. Helping speed up the discharge process.
20. **Pottering on the go:** The 'Rover' device helps with allocating porters to their next job. Porters will not be held back waiting for paperwork due to EPR, Virtual wards: providing care on the go and a general overview of the wards, and frailty success and ward overview and reduce the risk of infection by tracking every step of the patient care/journey.
21. **Hospital at Night:** Hospital at Night allows ward nurses to request jobs overnight or out of hours to a central point of access, coordinating clinical action In Basket is the EPR’s message-based task management system, which our clinicians use to streamline communication and coordinate clinical action across the trust with instant communication using the Electronic Patient Records secure messaging system. **Fast Pass success:** Fast Pass allows patients to request an earlier appointment on **MyFrimleyHealth Record** when cancellations or rebooking become available.
22. **Fast Pass success:** Fast Pass allows patients to request an earlier appointment  
    on **MyFrimleyHealth Record** when cancellations or rebooking’s become available.
23. **Instant communication:** The benefit **of Electronic Patient Records (EPRs)** is secure messaging within its system.
24. **A new way of check-in:** Self-service kiosks allow patients to check in to their outpatient appointments themselves helping reception staff during busy periods and easing patient flow in these areas.
25. **Responding to deteriorating patients:** EPR benefits from the way the Rapid Response Team works.
26. **Productivity and efficiency:** Benefits of EPR improving productivity and efficiency at the hospital.

**How all the Benefits would be managed: -**

In other to manage some of the benefits for example **Benefit 2 “Rapid access to information”** after a couple of months we would check to see if there are any data discrepancies how best to manage it and how it has been delivered the way we expected it to. This is where **benefit number 4 will** be useful “**Smartcards”** This will help Sync with the nationwide NHS spine for pulling nationally held information on patients. **“Instant communication”** This feature can help the clinical team keep each other updated about the patient's treatment journey and what next to do when it comes to the treatment plan. “**Improving flow and capacity”** This can improve patient flow on the wards and help the ward team keep track of what type of cleaning is needed when a patient is discharged before a new patient is admitted to the ward while understanding and keeping patient flow at a 100% turnaround.

* 1. **Stakeholders' feedback on the benefits of Electronic Patient Records (EPRs):** Below is an example of some of the feedback I got from various stakeholders regarding their benefit expectations.

|  |  |
| --- | --- |
| **Stakeholders Names:** | **Feedback:** |
| **Hannah Nunn:** | No longer have lengthy one-to-one handovers. Following the main group discussion, they go straight onto a computer to read the handover and view their patients' records. |
| **Charlotte Foster:** | The benefit of not having to share one hard copy of notes. |
| **Claire Tolliday:** | Created a dashboard within EPR to give a complete view of the current bed states across all inpatient areas. |
| **Mark Lepine-Williams:** | Secure chat system for porters to relay queries and messages directly to the team coordinators (speeding up the process and not requiring them to go physically and check with the team coordinators). |
| **Vicky Gentry:** | Benefits of EPR on infection incidents. |
| **Phil Earl:** | Staff viewpoint of benefits of EPR for the Rapid Response team. |
| **Tanya Santacaterina:** | The appointment templates we use within the Snap board feature ensure all patients receive a fair and appropriate time allocation. |
| **Vicky Gentry:** | Benefits of EPR on Infection Incidents. |

1. **CONCLUSION: -**

In conclusion, during the investigation and information gathering, I ***learnt***that in most cases the stakeholders/ stockholders are very sure what they want the new system to address and what should be included in the business model and processes captured in the design phase of the process mapping stages for them to see.

The visuals are designed so that modules can be added, and corrections done in the future, and the future state has not yet been decided or what to include in the future state when designing the process model/future state. Even with this, I still learnt that “**NOT**” all information gathered was relevant and a lot would be changed and not allowed in the future state/desired situation because of the financial implications and there are also modules that would have to be added on which I am capturing the business process model via process mapping using Microsoft Visio.

The process modelling/mapping of the current state of the inpatient journey is ***What went well*,** even though I was apprehensive about it during the presentation to stakeholders/stockholders’ expectations and changes in the final process mapping, and I was so glad that I met all expectations. On the other hand, the Theatre patient journey was the hardest one for me because the current state/current business practice was more complicated for me due to many stakeholders/stockholders coming up with different ways of doing things within their service lines which was mentally draining for me because of the back and forth, but the support I got from my team leader and colleagues got me through it and also gave me the boost I needed to push through. Even though I am still chasing some of the stakeholders to put their final stamp of approval on the finished design. It made me realise my patience and strength of being able to weather the storm of rejection in terms of the stakeholders accepting my first process modelling of the desired state.

I had to schedule new meetings with the stakeholders (Consultants, Matron, Nurses, and Secretary) to understand what the new process is supposed to address so as to not make mistakes or have it rejected again. ***What I will do differently*,** is make sure that I meet with all the stakeholders/stockholders more than regularly to get their input till the very last design and make sure I send the sample design to them after every stage of the design is completed as many times as possible for them to look at and make corrections before I design the desired situation/future state process model.

**References:**

* [The Health And Care Act: Six Key Questions | The King's Fund (kingsfund.org.uk)](https://www.kingsfund.org.uk/insight-and-analysis/long-reads/health-and-care-act-key-questions?gad_source=1&gclid=Cj0KCQjw2a6wBhCVARIsABPeH1sYbqG0XNqVZsdEe8LIXNWpLvtA8znraxRsgQU39Af_6eWnVZcHSeAaAm5wEALw_wcB)
* [The Electronic Health Records System In the UK | Centre For Public Impact (CPI)](https://www.centreforpublicimpact.org/case-study/electronic-health-records-system-uk?utm_term=&utm_campaign=United+Kingdom+-+Dynamic+Search+-+How+We+Help?&utm_source=adwords&utm_medium=ppc&hsa_acc=9564221613&hsa_cam=1641146868&hsa_grp=68170737292&hsa_ad=314833667704&hsa_src=g&hsa_tgt=dsa-527069888850&hsa_kw=&hsa_mt=&hsa_net=adwords&hsa_ver=3&gad_source=1&gclid=Cj0KCQjw2a6wBhCVARIsABPeH1v2Ke3eTdvVx2k_JlX7AEfB_qKDMUWcZk_5tvuXbzQGRcMIIArzHTQaAuyBEALw_wcB)
* [Interim Report prepared by Milieu Ltd for the European Parliament under Service Contract IP/C/PETI/IC/2008-042 (europa.eu)](https://health.ec.europa.eu/system/files/2016-11/laws_united_kingdom_en_0.pdf)
* [90% of NHS trusts now have electronic patient records - NHS England Digital](https://digital.nhs.uk/news/2023/90-of-nhs-trusts-now-have-electronic-patient-records)
* [A plan for digital health and social care - GOV.UK (www.gov.uk)](https://www.gov.uk/government/publications/a-plan-for-digital-health-and-social-care/a-plan-for-digital-health-and-social-care)
* [NHS England hits 90% target for electronic patient records | Computer Weekly](https://www.computerweekly.com/news/366560172/NHS-England-hits-90-target-for-electronic-patient-records)
* [What is functional requirements? | Definition from TechTarget](https://www.techtarget.com/whatis/definition/functional-requirements)
* [What is Jira? | Definition and Overview (productplan.com)](https://www.productplan.com/glossary/jira/)
* [Microsoft PowerPoint - Requirements Engineering v5.1 All days (estio.co.uk)](https://elms.estio.co.uk/file/64a7b362062551fb41f6a49f31ffb98d/RE%20Slides%20All.pdf)
* [Writing Effective Requirements (estio.co.uk)](https://elms.estio.co.uk/file/fa35a72eb27c75e4b8812df81e0151cb/Writing%20Effective%20Requirements.pdf)
* [Nonfunctional Requirements: Examples, Types and Approaches (altexsoft.com)](https://www.altexsoft.com/blog/non-functional-requirements/)