**Team Concept Proposal**

**Team - No Name**

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**Introduction**

With the development of science and technology, the future content of the development of medical treatment in human life will need to get more attention, mainly to provide better medical services to improve the quality of human life. Therefore, in telemedicine, how to use the existing technology to intervene in advance the user's health problems or in the later stage through some technical means to help patients treat and record personal treatment status will be a problem worth thinking about in the future. At present, the team wants to do later intervention measures for the user's information. Help patients record each examination information, and authorize the transmission of past cases to rehabilitation doctors through scientific and technological means. In order to help the communication between patients and doctors. Quickly synchronize the information in a short period of time. So as to provide patients with good welfare health and other medical services.

**Domain/Problem Space**

The chosen domain was changed from the initial domain of mental health to public health as we felt that the mentally ill target audience was hard to contact within this period. The proposed problem still exists within the domain as it could be experienced by anyone that visits a medical institution. The proposed problem space was that shared information regarding previous health conditions/issues of patients are not being exercised by medical institutions, which could lead to inaccurate data that can prove detrimental to one’s health.

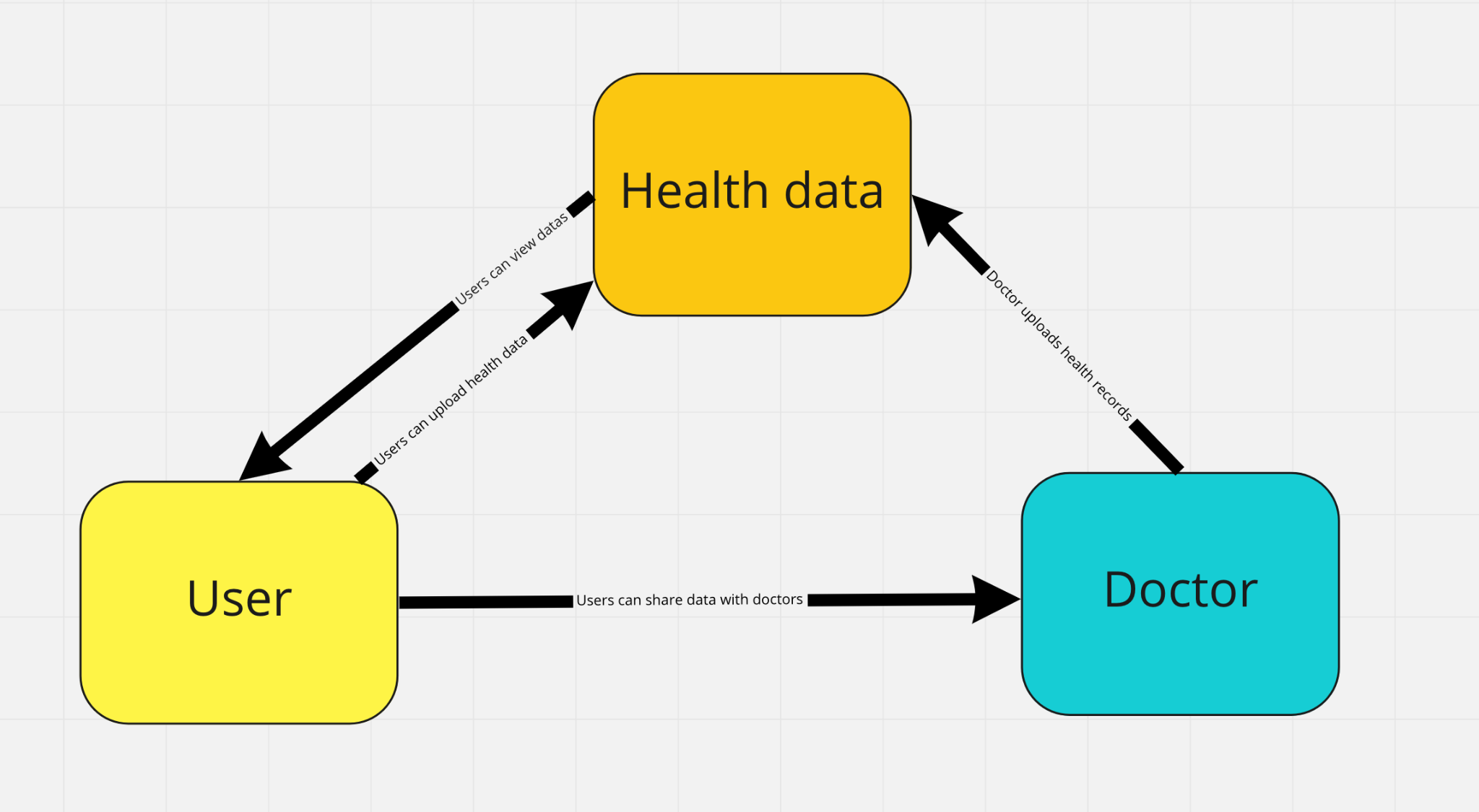
To further verify the proposed problem, interviews were conducted to understand the general consensus among the public regarding the social securities of shared information. However, we realised that the general public may be too broad of a target audience and thus decided to focus specifically on adults in their mid 20s early 30s. The results from the interviews proves that the problem is at large, that medical institutions do not share patient information among each other, and that security wouldn’t be an issue if done properly complying with standards. Interviews with doctors would have yielded greater understanding on the proposed problem however it was hard to contact them with short notice. Doctors are critical stakeholders as they are at the front-line combating medical issues, and ideally should provide qualitative insights regarding situations within the medical industry.

Furthermore, a research paper that explored the implementation of a patient-centred hospital information system suggests a model that would benefit the patients whilst also complying with international specifications and standards of interoperability and security [5]. This research paper uses international experiences from Australia and Denmark to examine eHealth strategies as it is believed to be two representative cases of the importance and the utility of eHealth national strategy establishment. From the insights gathered, it does seem that global implementation of patient-centred hospital information systems has yet to become the norm, despite the research paper listing benefits such as providing patients with easier access to “good and equal health and welfare” and improving the quality of patient care, ultimately understanding and meeting their needs.

**Design Opportunity**

Through research and interviews, our team found that medical institutions did not use shared information about patients’ previous health conditions and problems. This situation may cause doctors to not fully understand the patient’s medical history and lead to misdiagnosis. In domain research, we found some potential design opportunities and initial concepts. When consulting a doctor, patients may encounter problems that it is difficult for them to describe their symptoms. For doctors, they need to know all the information accurately [1]. Through research, our team believes that we need to use mobile application technology to help patients collect their health information and share this information with the patient's attending physician. In another paper, a patient-centred application for recording health records was proposed. Doctors can directly view the patient's medical records, which can prevent patients from missing important information when communicating with doctors [2]. Furthermore, it is mentioned in the paper that in the field of medical care and related fields, new technologies can be applied to monitor the state of the body, that is, blood sugar level, eye condition, heart rate, etc. Cloud storage and real-time data exchange technologies allow people to monitor their physical health anytime and anywhere [3].

Based on the results of our team’s interviews and research, our team believes that we can design an application for patients to store patient medical and health records. Users can choose to share their medical records and health data with their doctors, so that doctors can better treat patients by obtaining complete records of patients. The basic principle of the application is that users hold their own health data through mobile phone storage, and users can view their own health data anytime and anywhere. When the user goes to the doctor, she can choose to share her medical history with the doctor, and the doctor will obtain the patient's health data. After the doctor's diagnosis is completed, the doctor can input the diagnosis result and treatment plan into the application so that the patient can view or share the data with other doctors in time.



*Figure 1: Fundamental*

In the design of the application, we will consider how to align our conceptual model with the user's mental model. The paper mentions that the patient’s cognition is taken as the main consideration, through visualized visual symbols, pictures and videos to help patients understand the concept of health and the state of health [4]. The application of our group will express the health status of patients through visual symbols in different colors. Red usually represents danger and green represents health. In addition, after the doctor enters the diagnosis information, the application will provide pictures or videos to help users understand complex disease concepts.

**Concept and Justification**

Firstly, because the interviewee mentioned that when he went to a new hospital for reviewing his health condition, the doctor would ask about his health issue again. This answer implies that when they change to another new hospital and they need to re-describe their health condition, people would feel inconvenience. As a result, it is necessary to generate a system that helps patients and doctors save their consultation time. This system allows patients’ information to be shared among hospitals. If a patient changes another hospital to see the doctor, the doctor can use this system to extract the patient’s previous cases, thereby saving the efficiency of the patient’s treatment.

Sharing is the biggest difference between our approach and existing approaches. Existing approaches to patient medical data recording mainly include traditional paper medical records and Internet-based electronic medical records. These products cannot realize the sharing of medical information among medical institutions. But we will build a safe and efficient sharing application for electronic medical records based on mutual consent. It can share information with doctors in multiple medical institutions, so it contains information from all doctors involved in patients' treatment. This approach can facilitate the easy sharing of medical information among stakeholders, and the information moves to various medical institutions with patients. Authorized medical professionals can consult the records of patients according to their duties and clinical needs. This approach provides medical care with the ability for multiple parties to participate in the exchange of information. Generally speaking, our shareable electronic medical records is different from traditional medical records and improves theInternet-based general electronic medical records.

However, in the following answers, we found that interviewees would also be concerned about information security when they asked about data sharing questions. The paper discussed online medical records for patients, in the implication of this paper, it mentioned about the information security issue for patients[6]. Because in this paper, the system is used by hospitals, patients’ medical records would be shared between hospitals. It means when people change to a new hospital, people are willing to use a more efficient way to help them save more time, but if their data would be shared between hospital institutions, they would be concerned about their information security issue. Even if people do not mind that their information would be shared between hospital institutions, they would still worry that their information would be leaked to others. Thus, based on the answers from interviewees and the paper, we found that we need to pay more attention to the information security aspect for this system, a patient-oriented system is required for our system to better protect patients’ information security.

Additionally, as for the way to present this system, we decided to generate a mobile app. Because our target users are patients who are from 20 to 30 years old, we need to ensure that people are comfortable using our system. Nowadays, each young person has a mobile phone, compared to generating a website, a mobile app would have higher usability for the target users. So, we choose to generate a mobile app for dealing with the problem space.

In summary, as for our design concept, we will try to create a patient-oriented mobile app that allows patients to store their own medical records online, and this app supports patients to share their medical records between different hospitals with information privacy protection.

**Plan of Work**

The following is the work plan designed by our team.

**Initial Requirements & Design (Week 7)**

* User research/survey

We will use interviews with doctors and patients and invite them to fill out questionnaires to discover the most distressing problems for them. In addition, on-site observations will be used to find problems.

* Form user personas and scenarios based on initial surveys and questionnaire data to understand how to design for our ideal users.
* Gathering data from more research sources (exploring past solutions and similar concepts to see what could be pitfalls to avoid or learning for our own solution).
* Preliminarily determine the function of the product

Summarize the information obtained through interview questionnaires and field observations, and determine the function of the product.

* Design a wireframe to describe how the product interacts

**Prototype & Initial Evaluation (Week 9)**

* Making up Initial prototyping

We will use Design Walkthrough, Think Aloud and Time on Task methods will be used on testees of various backgrounds to simulate varied user testing.

* Summarize the test results and improve the prototype

Summarize the results of user testing, improve the initial prototype and add or delete design functions.

**Iteration & Formal Evaluation (Week 11)**

* Generate new high-fidelity prototypes based on previous user feedback.
* Cognitive walkthrough and Usability testing will be conducted with a new prototype for evaluation.
* Gets us valuable (final) feedback about our more developed prototypes.

**Final Prototype (Week 12)**

* We will use Cognitive Walkthrough and Usability Test methods to test the prototype.
* Prepare for final delivery at showcase

**Suitable methods for further investigation and evaluations:**

**in-depth interviews:** Taking learnings from domain research articles, in-depth interviews are a good discovery-oriented method to have open-ended answers from interviewees, to get detailed insights about our solution from stakeholders.

**online surveys/questionnaires:** is an efficient and low time investment method of gathering statistical data about our target audience. This research method has also been heavily used in domain research to get demographic data and also to understand user’s needs

**paper prototyping:** paper prototyping is an effective form of early-stage usability testing and also for testing proof-of-concept in the initial stages of our product iteration

**usability testing:** This is an effective mid-late stage iteration testing tool which focuses on user-centered interaction design in order to evaluate how real users will use our system. All our prior domain research articles that involve user testing will include this method will goes to show the importance of it in ensuring the adequate feedback is received and ensure higher satisfaction with our solution

**review of existing solutions or previous plans to design for the space (case studies):** We can use previous findings and learnings of similar solutions in this space to avoid mistakes that others have committed.

**Team**

**Yuanchao Jiang -** My strengths are design skills and report writing. I can provide the team with many different design ideas, and can skillfully apply design principles to improve prototype design. Since the course has a lot of writing work, the advantages of being good at writing reports can also help the team better. My shortcomings are communication and programming. My communication skills are weak, and I hope to improve my communication skills through this group. I will communicate more actively with my teammates in the next work to ensure the smooth progress of the project. I will also learn from my teammates who are good at becoming so as to improve my programming skills.

**Jordan Lean -** My strengths are that I am able to efficiently problem solve, whether it’s in code or ideation and will not hesitate to provide my opinions/constructive criticism during any meetings. My weakness is that I may take a while with coding. My aim is to contribute with high standards to work ensuring that the team completes tasks in an orderly and timely manner. Providing a prototype that is impactful and beneficial towards society, hopefully contributing to a solution. For project delivery, I will ensure full communication with every team member when an issue arises or when a submission is taking place (code or ideas). I will contribute to discussions when an issue arises during the production/designing process and try to help if possible (doing more research, giving suggestions). If an issue arises for me, I will not hesitate to communicate the problem to the team members. Hopefully by the end of this course, I will be able to think critically to provide a solution that can change lives, and if not learn the skills to do so.

**Raymond Chan -** My strengths are in programming so I can likely help with any of the prototypes that the team is planning to create. I am also fairly comfortable with report writing and research so I can help in that regard if any of my team members need help. My weaknesses would mainly be communication and idea generation. I hope that from this project, I am able to further develop my strengths and use them to help my team, and also take the opportunity to improve on my weaknesses by practicing them in the project.

My main goal is to be able to contribute meaningfully to the project and also create an idea and solution that our team is happy with at the end of the project.

**Xiaodan Liu -** My strengths are that I can come up with various ideas, so I can help the team efficiently generate ideas and provide effective opinions and suggestions at all stages of the project. I am also very good at UI/UE design and can help the team in this aspect. My weakness is that it is difficult to code. I hope that through this project, I can develop excellent interaction design and graphic design skills and use my strengths to help the team complete the project. At the same time, I hope to improve my weaknesses. My goal is to complete the task in time and make a meaningful contribution to the project, and be able to provide a prototype that is beneficial to the health field at the end of the project.

**Yu Bai -** My strength is writing reports and providing good design ideas. In the design process, I can provide the team with good design ideas and contribute to the team in writing reports. My weakness is code writing, because I haven't learned much programming knowledge, so my ability to write code is relatively weak. I hope I can give full play to my strengths and work hard to make this design well. And through this project, I can improve my aesthetic and design abilities.

**Xinkai Tang -** I have the following strength: 1. For product solutions, I can quickly focus on the user's pain points and help the team find the design direction efficiently. 2. Due to a long period of work experience, I can quickly criticize and make decisions based on different opinions. 3. At the same time, I am also good at design. I can quickly complete the work with proficient UI/UX technology in the progress of the project. 4. I can have better progress control for the project and clearly understand what work and iterations need to be done in each stage. My weakness is code content. Because there is no better code foundation, I can not undertake more code work. My goal has two stages: 1. I can complete the division of labor in a timely manner in the project and help the team members to complete the task. 2. I hope to truly provide a product that can help users improve their quality of life.

**Tianchang Sun -** My strength is writing reports and generating various ideas for the design. As for creating the prototype, I am good at UI/UX design, I have learned some UI/UX skills in the previous courses, I could use UI/UX technologies that I learned before into the team project. My weakness is coding, I only learned about basic python knowledge, so I prefer to be responsible for the design part of the team project. I hope this project could help me improve my weakness. My goal is to improve my weakness and apply my UI/UX knowledge into our teamwork for achieving our team goal.

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**Appendix**

**Interviews**

**1. What are your thoughts on medical institutions sharing your patient information regarding health issues so that no matter which institution you went to they would know your medical record?**

A: I am not comfortable with data sharing, but since this is related to health issues it would make sense that medical institutions would share data with other institutions. This can provide a more convenient way for medical staff as well as patients. Although I would presume that medical staff should still question patients about those health issues.

**2. Have you ever been to a new medical institution that knew what your previous conditions were?**

A: I personally have not.

**3. What do you think about the security of sharing this patient information? Could you elaborate further?**

A: Like I said previously, as long as it is shared within the medical institutions, I don’t see a big issue. It’ll probably help with providing patients a more speedy and effective solution since medical staff would know about their conditions.

**4. What are the ways you use to provide information to these medical institutions?**

A: Usually, I am asked by the doctors themselves, however things like blood tests are usually sent to the prescribed doctor from the script. Another way was to fill in forms.

**-Prompted question from 4-**

**How would you describe these forms?**

A: Well, they ask a lot of general stuff like allergies and previous visits, however the doctor would then ask the specifics when you enter his office/workplace.

**5. Have you had any experiences where you were frustrated when providing information to multiple medical institutions?**

A: Usually, it’s not a huge issue providing information. I don’t think I’ve ever gotten frustrated because it is important that the doctors know the exact condition I am in.

**6. What sort of technology (app, web, etc.) would you think might be best for storing and transmitting data? Can you elaborate on that?**

A: These days everyone’s on their phones and I’ve seen some medical apps on the apps store. Potentially an app but it would require some networking with the medical system to relay the data to them.

**Research paper abstract**

[ArabWIC 2019: Proceedings of the ArabWIC 6th Annual International Conference Research Track](https://dl-acm-org.ezproxy.library.uq.edu.au/doi/proceedings/10.1145/3333165)March 2019 Article No.: 10 Pages 1–6 <https://doi-org.ezproxy.library.uq.edu.au/10.1145/3333165.3333175>

**Abstract:** In Morocco, most Hospital Information System projects undertaken by the Moroccan health sector are technical-oriented and executed as independent projects, with a focus on the management of administrative and financial activities above patient needs and the importance of business process improvement. This paper aims to fill this gap by proposing a global architecture for a Moroccan 'Patient-centered Health Information System' and a method to deploy it. This proposal is based on national and international eHealth experiences and provides a clear and comprehensive view of what a Moroccan Health Information System should look like. This paper focuses on describing the main requirements that should be implemented to enhance the quality of Moroccan patient care.