

Patient Monitoring System

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Abstract—The innovations and research in technology led to smaller sensor technology. There have been various attempts to increase the quality of life for humans all around the world utilizing small sensors. Especially the healthcare sector benefit a lot of that technology. Nevertheless the healthcare industry in our modernized world lags behind giving a good medical assistance to patients and doctors. The main problem of current systems is the lack of efficiency when it comes to usability and automation. There is especially room for improvement regarding independent execution without the frequent need of medical staff.

I. INTRODUCTION

The characteristic of any Patient Monitoring System (PMS) is the continuous measurement and observation of physiologic parameters like heart rate, oxygen saturation, respiratory rate and so on. It is crucial that such systems react very accurate in real-time to ensure effective care for an critical ill patient. Monitors are used to display data next to the patients bed. This physiological data has to be stored and analyzed either by the system itself or/and by the medical staff. Especially for intensive care units(ICUs) or operating rooms(ORs) Patient Monitoring Systems are significantly important for modern and successful health care.

The first thoughts which come in mind when you here the term Patient Monitoring System are a system which watches and warns about serious and life-threatening events. It should also provide guidance for care of the critically ill.

The system which will be highlighted in this report should be specialized especially for old people which often suffer from high blood pressure or diabetes. Since such patients are not necessarily on ICUs or bedridden the system should be also portable. So called mobile patient monitoring (MPM) is very helpful for patients which suffer from chronic diseases like diabetes. Chronic diseases lead to high health care costs and decreased productivity of humans in society [1]. Especially diabetes is responsible for 15 percent of national health care budgets [2]. Patient Monitoring plays a significant role for ensuring the quality of care and thus the quality of life.

Many hospitals today are fully occupied due to staff shortage. So it is even more important to design a portable system to have the opportunity that a patient can take it at home. This would provide the opportunity of remote medical diagnosis from a doctor. Mobile health is an important aspect for overcoming barriers of health service personnel, continuous access to health information and to prevent delays and errors in suitable treatment.

When it comes to designing such a system many decisions have to be made. First you need to decide which functions should be covered. Of course the initial thought of the perfect system would cover every use-case, would monitor every physiologic parameter and would assist for many medical treatments. The result of such a solution would be very expensive, complex and thus maybe also vulnerable for errors since the meet of many components can lead to unpredictable conflicts (noise, heat..). Third world countries often cannot afford enough of such expensive systems which makes the cost factor even more important since these countries lag already behind regarding health care. In addition to that depending on the patients medical condition many functions would be redundant. The better approach is to design PMSs which are sufficient for a more specific use case or patient case.

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II. CONCEPT

Image of the concept with all main elements/components
- Text explaining the concept

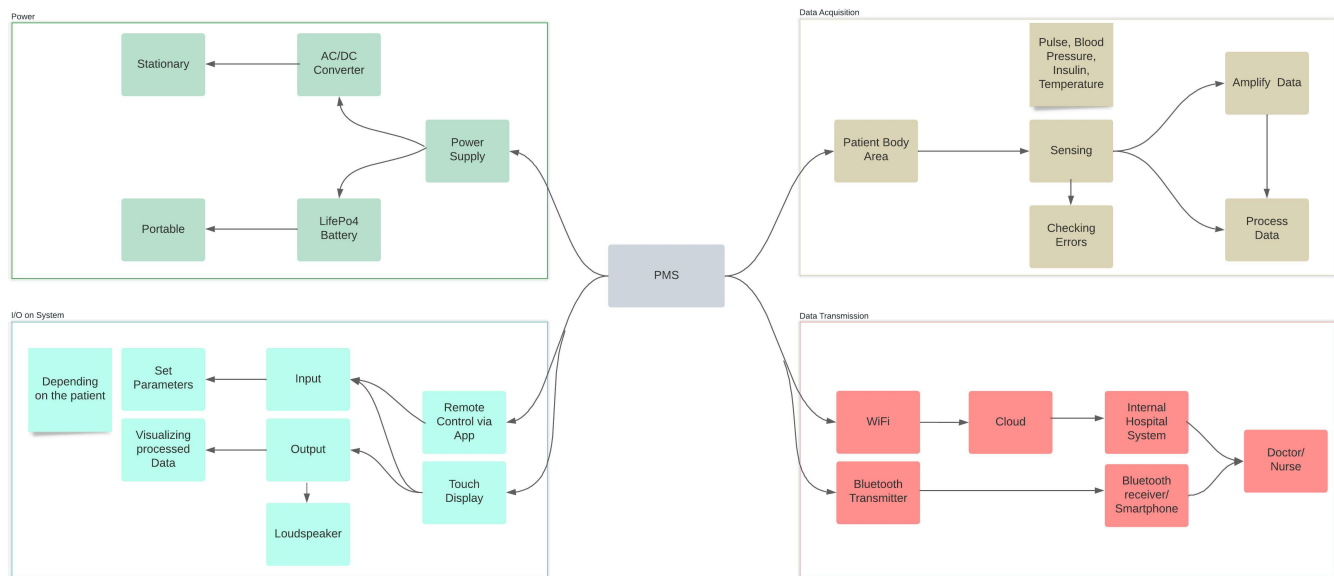


Figure 1. Concept Map

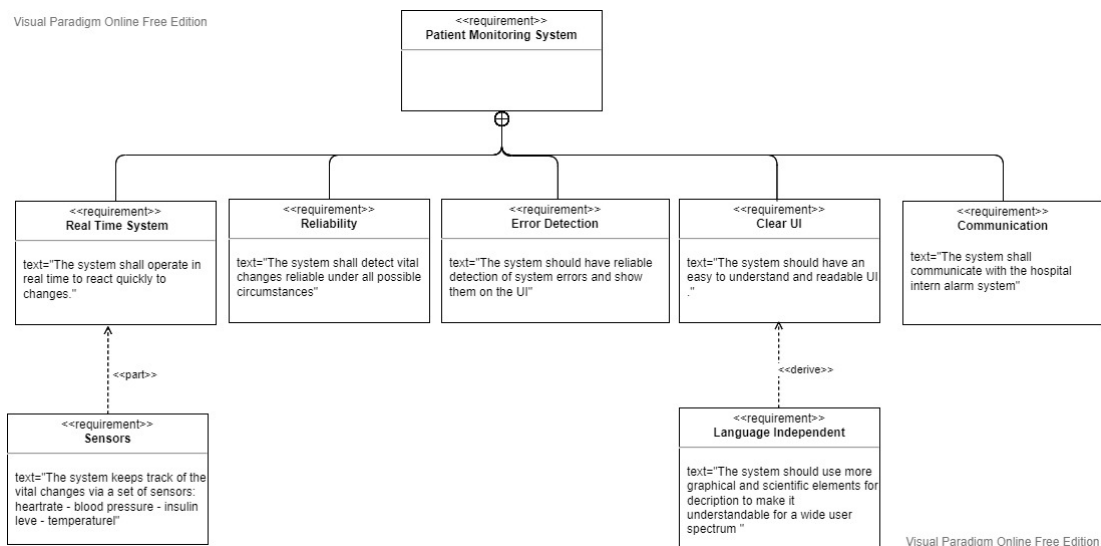


Figure 2. Concept Map

III. DESIGNING OF THE CONCEPT

Requirements

Models (Use case, activity...)

Hardware

Critical-based parts of the system (redundancy, “safe state” when crashing...)

User interface (how users can interact with the system)

IV. DISCUSSION

What your concept covers so far

Does it solve the initial problem?

Points that you have improved on your concept during the exercises/lectures

V. CONCLUSION

Short overview of the project and the main conclusions

VI. FUTURE WORK

Future directions

REFERENCES

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