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An Introduction to Pervasive Biomedical Informatics

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I. Introduction:

In recent times a lot of smart technologies have been developed worldwide to make the world smarter. There are different scopes of development where smart e-healthcare is one of the most concerned topics among them. To make the world health healthier and more manageable we should think about it in more depth technically [1], [2].

II. Coining a new term:

Pervasive Biomedical Informatics (PBI) is a novel domain of research that is combined of pervasive computing, biomedical engineering and informatics. In this article we coin the "Pervasive Biomedical Informatics" to design and imply a new area that could bring a new horizon in smart healthcare system. To know about this term first we should know about each part of this term. Pervasive means anything at anytime, anywhere. It helps to make effective communication in every useful device like laptop, mobile or smart devices by using computational method to minimize the need of interaction with computer. Pervasive computing devices are network connected and constantly available. Pervasive computing is energy constraint, consumer safe and logistics [3]. It is widely applied in healthcare system. Biomedical Engineering is the field where the engineering principles are applied and design concepts to medicine and biology for healthcare purposes. In this context, the informatics would involve processing, analytics, management, and prediction of clinical or pervasive biomedical data. Further, Internet of Things (IoT), big data, and machine learning (ML) shall be incorporated within this proposed field of PBI to enhance the qualitative and predictive measures of aforementioned pool of data. This proposed applied field

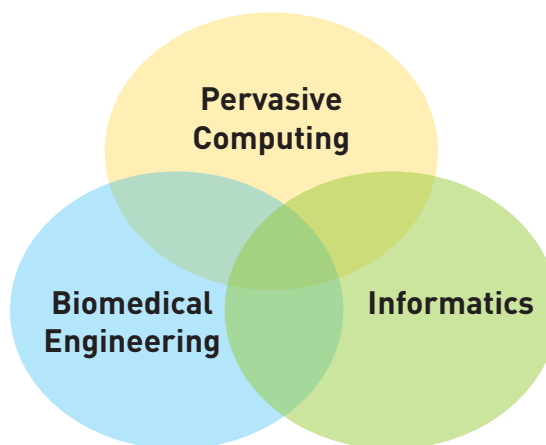


Fig. 1: Three major fields of Pervasive Biomedical Informatics

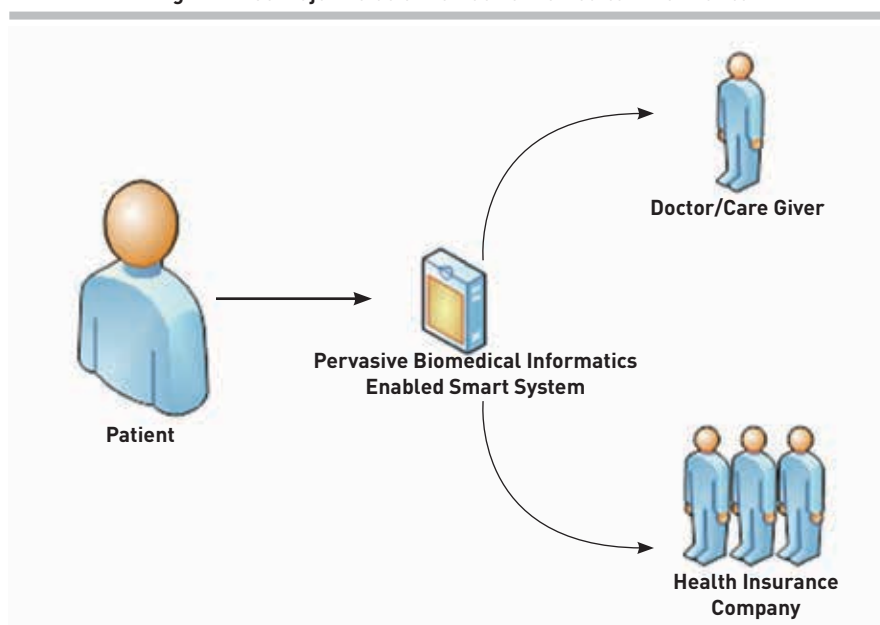


Fig. 2: A schematic representation of Pervasive Biomedical Informatics system

shall establish the interaction between humans and information alongside the construction of interfaces, organizations, technologies and systems.

III. Objectives:

We are trying to make these three fields come together for the sake of healthcare[4], [5]. The aims of this proposed area are a) to make health

awareness among the individuals through high quality information processing system, b) make the resource constraint and low time consuming system, c) use of easily accessible devices like low cost smart devices, mobile, laptop, d) to predict the health condition of a patient by using data science, machine learning and telecommunication and alarming the doctors or care givers for taking necessary action [6], [7]. The main reason to coin this area to make a smart healthy society. It may improve the whole infrastructure of healthcare system.

IV. Possible applications:

A glucose monitoring device can be used as a PBI enabled smart system. The working principle of this device works biomedically that means this device can monitor the blood glucose level by using the biomedical kit strip by self-help [8]. If this device is being improvised with machine learning process and incorporated with data science interpreter system then this biomedical device may act as pervasive computing device along with information processing capability. When the patient or the smart user constantly monitor his/her blood glucose level then each output will be saved in data processing center of that monitoring device [9]. Those real-time blood glucose level data through a year or more or less will be processed and analyzed accordingly. This system shall predict the upcoming health condition and shall aware the patient as well as the connected doctors about the condition if necessary. If the condition needs serious health checkup

and surgery then the interconnected health insurance company also get informed which may assist the condition economically [10], [11], [12]. Hence, a complete health care can be monitored and possibly cured through Pervasive Biomedical Informatics. This new field will definitely enlighten us towards the smartest healthy society [13], [14].

V. Conclusion:

This is the new genre of healthcare society which involves pervasiveness along with biomedical applications and data informatics. If this three fields can successfully come together then it may help the whole society to keep healthy and aware.

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