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Smart E-Health Records using IoT

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ABSTRACT

Aging population and the increase in chronic diseases demands efficient health care solutions for maintaining well being of people . The research focus is on remote health monitoring system based on internet of things (IOT) technology. This paper explores the use of iot based applications in medical field and proposed an approach for maintaining hygiene in hospital.

INTRODUCTION

The Internet of Things (IoT) is defined by International Telecommunication Union (ITU) and European Research Cluster on the Internet of Things (IERC) as “a dynamic global network infrastructure with self-configuring capabilities based on standard and interoperable communication protocols where physical and virtual things have identities, physical attributes, and virtual personalities, use intelligent interfaces and are seamlessly integrated into the information networkThe e-Health concept is used to describe the new "model centered on consumer" of health systems, that combine the health science and technologies with information and communication technologies that can be used as a key solution to provide significant health benefits at individual level as well as at society level

In the context of Internet of Things (IoT), the research is concerned with the development of applications for end-user devices, i.e. devices through which the end-user directly interacts with systems. The complexity of such applications is partly due to network intricacies, and partly because GUI (Graphical User Interface) development is generally complicated and time consuming. This research employ a middleware framework called PalCom to manage the former, and focus our research on the problems of the latter, by expanding the scope of PalCom to also enable GUI development.

In particular, the research goal is a more efficient GUI development approach that does not require program code to be written. To enable end-users with little or no programming experience to participate in the GUI development process, this research eliminate the need for programming by introducing a new development approach. This research view this approach as “transpose” in that the development focus is on presenting functionality from an application model as graphical components in a GUI, rather than on retroactively attaching functionality to manually added graphical components. The transpose GUI development approach is supported in two steps. First, this research design a language for describing GUIs, and implement interpreters that communicate with remotely hosted application models and render GUI descriptions as fully functional GUIs. Second, these researches implement a graphical editor for developing GUIs in order to make the language more accessible.

The presented solution is evaluated by its application in a number of research projects in the domain of E-health. From the GUIs developed in those projects, these researchers conclude that the GUI language is practically viable for building full-blown, professional grade GUIs. Furthermore, the presented graphical editor is evaluated by direct comparison to a market leading product in a controlled experiment. From this, these researchersconclude that the editor is accessible to new users, and that it can be more efficient to use than the commercial alternative.

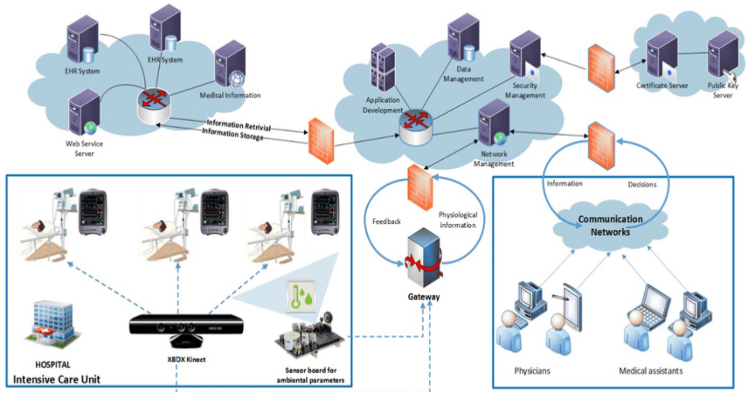


Fig 1. Architecture of the health care system for monitoring of patients at risk in smart Intensive Care Units.

PROBLEM STATEMENT

This research work is concerned with the development of applications for end-user devices in IoT systems. Devices can be any type of hardware, from simple devices such as temperature sensors, to complex ones such as tablet computers. Furthermore, devices can be distributed across multiple networks, and communicate by sending data packages (messages). An end-user device is any device through which the end-user can directly interact with the system in some way.Graphical user interface includes the functionality needed to enable the end- user to graphically interact with the application. Application logic includes the core functionality of the application. Depending on the application domain, this can include any type of functionality, from patient data management to handling sensor readings. Network interface i n c l u d e s the functionality needed to enable the device to communicate with other devices in the system.

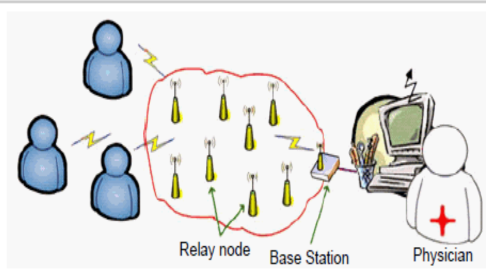
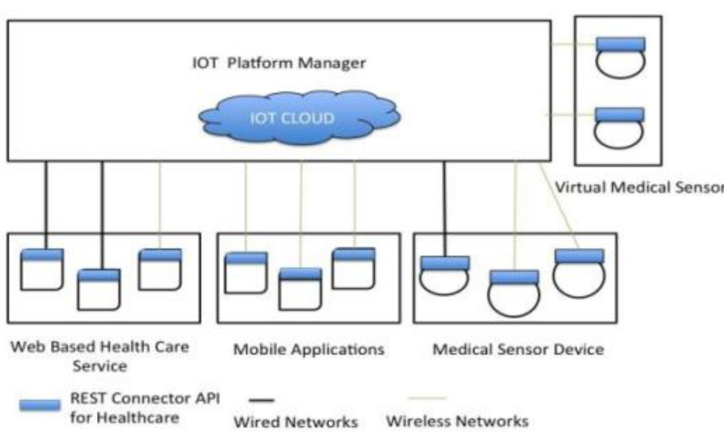


Figure 1: Architecture for proposed healthcare system in hospital.

Figure 2. 1. Architecture for proposed healthcare system in hospital

LITERATURE SURVEY



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In a visionary paper, ubiquitous computing is described as "a new way of thinking about computers, one that takes into account the human world and allows the computers themselves to vanish into the background" [3]. The concept shifts focus from ordinary desktop and laptop computers, and instead envisions a world this research all devices in the environment – big and small – are connected to each other. With such large amounts of computing devices, it is not feasible for devices to demand attention from the user, or even for the user be aware of them: they have to vanish into the background. This researcher made a comparison to the amount of motors in a modern car. There are motors for starting the engine, turning the windshield wipers, etc. The user of a car does not have to be aware of, or pay special attention, when using these motors. In the same way, ubiquitous computing envisions a world where the user should not even notice when she is using a computer; they will be integrated in all aspects of life, virtually invisible to the user[4]. The technologies that support this are referred to as calm, in that they are proactive and avoid disturbing the user [5].

This researcher outlined three key challenges for realizing ubiquitous computing [6]:

– The need for wireless bandwidth will be substantial. Even assuming modest bandwidth requirements per devices, the sheer volume of devices will amount to a collective demand that is challenging to meet.

– Support for mobile infrastructure must be provided once it becomes norm, rather than exception, that computers migrate from network to network. This researcher mentioned that protocols such as TCP/IP need to be reworked for mobile scenarios.

– With system interactions happening on many different types of devices, user interfaces that can migrate from one screen to another must be supported; the users must not be limited by the capabilities of individual devices.

These challenges this research at the time significant and, as time would tell, far ahead of their time in terms of any sort of Ubiquitous computing, pervasive computing and Internet of Things are three terms that, while different from a historical perspective, are nevertheless used interchangeably to refer to a world where interconnected devices fill our surroundings. To technically support this, a middleware can be considered – This project presents PalCom and has been used in a number of research projects resolution.

Since the time this researches first described ubiquitous computing, many projects on the subject emerged at universities and in industry. By 2001, ubiquitous computing had also become known by the name pervasive computing [7]. The idea was to re-evaluate the concepts of ubiquitous computing based on roughly a decade of hardware progress; elements that this research exotic in 1991 this research by then becoming commercially viable, e.g. handheld computers and wireless networks. The refined vision of pervasive computing can be summarized in three precepts [8]:

– A device is not a mere container of applications that mustbe managed by the user. Instead, a device is a window into the computing environment.

– Applications are designed to assist the user in performing a specific task, not merely to exploit the hardware capabilities of devices.

– The computing environment is used to enhance the surroundings of the user. It should not be limited to storing data and running software. In pervasive computing, devices are hence seen from a perspective of possibilities rather than limitations. A device is a window to external functionality, and should not be limited by device hardware. The last precept restates the original vision of ubiquitous computing this research, putting focus on the user experience in the computing environment, and de-emphasizing the focus on traditional software.

Pervasive computing is closely related to, and builds upon, results of the related research fields of distributed computing and mobile computing [9, 7]. Distributed computing arose in order to bridge the gap between personal computers in local area networks. In distributed computing, system components are distributed across multiple networked computers – nodes – that communicate

by sending network messages. By using this approach to system design, goals beyond the capabilities of any single node can be accomplished. The concepts of this field, e.g. remote communication, fault tolerance and security, are essential to pervasive computing; they are this research covered by the literature, e.g. [10]. A related field is mobile computing, which was conceived when researchers had to confront the challenges of building distributed systems that include mobile devices.

METHODOLOGY

Johannesson and Perjons [13, 16] define the goal of empirical research as describing, explaining and predicting the world. This must be done faithfully and with great attention to detail, and always without regard to personal interests and biases. In contrast to empirical research, Johannesson and Perjons define design research as going beyond describing, explaining and predicting: it aims to change and improve the world. To achieve this goal, novel artifacts are conceived and created. Furthermore, the authors state that in contrast to plain design, design research also seeks knowledge about the artifacts, their use, and their environment. The overall research methodology applied for the research in this dissertation is design science, a special strand of design research. Design science aims to “create innovation in the form of ideas, models, methods and systems that support people in developing, using and maintaining IT solutions” [14, 15]. In our work the focus lies on simplifying the process of creating GUIs, ultimately to the point where even non-programmers can engage in the activity. As such this research have implemented and evaluated a number of artifacts to learn of their impact on the user. Johannesson and Perjons describe the six main activities of design science, which is outlined and related to this research are as below.

Explicate Problem: This activity is about investigating and analyzing a practical problem, where the problem should be of some general interest. The activity precisely formulates and motivates the problem by highlighting its significance in some practical setting. This research have in this chapter presented our problem and why it is relevant, and formulated specific research questions.

Define Requirements: The explicated problem is further processed in this activity by proposing artifacts that could solve the problem. The artifacts are defined in terms of requirements that can be traced back to the demands from the problem statement. For research, to start from an initial set of requirements based on research questions and the context-of-use for proposed artifacts. Additional requirements this research subsequently collected iteratively based on experience and feedback from using the artifacts in their intended practice.

Design and Develop Artifact: In this activity, the explicated problem is addressed by creating one or several artifacts that satisfy the defined requirements. In developing artifacts, related solutions in previous work have been an important resource of inspiration. Conventional computer science and engineering principles are to be used for the implementation of work.

Demonstrate Artifact: This activity serves as a soft evaluation (proof-of-concept) to determine whether the created artifacts are practically viable. For this purpose, the artifacts are used in illustrative or real-life cases. In the latter, the activity also serves to communicate the solution to the intended users.

Evaluate Artifact: I n this activity; the artifacts are evaluated to determine to which degree they solve the explicated problem, based on the defined requirements.

BMI Algorithm

The BMI algorithm consists mainly the combination of BM algorithm with the preprocessing and the pattern matching. The preprocessing process mainly performs to calculate jump shift function OneChar(x) and TwoChar(x).

The BM algorithm scans the characters of the pattern from right to left beginning with the rightmost one and performs the comparisons from right to left.

Assume that a mismatch occurs between the character P[i]=b of the pattern and the character T[i+j]=a of the text during an attempt at position *j*.

Then, P[i+1…m−1]=T[i+j+1…j+m−1]=u and P[i]≠T[i+j]. The good-suffix shift consists in aligning the segment T[i+j+1…j+m−1]=P[i+1…m−1] with its rightmost occurrence in Pthat is preceded by a character different from P[i].

The maximum shift distance of BM algorithm is *m* characters. But the maximum shift distance of BMI algorithm is (m+l) characters. The basic idea behind the BMI algorithm is to achieve the maximum shift distance in the event of a mismatch.

Assume that now P[0]…P[m−1] correspond to T[i]…T[i+m−1]during the attempt. If a mismatch occurs, the shift right position will be calculated with function Onechar(x) and TwoChar(x).

Though the difference is small, the frequency of occurrence of the maximum shift distance have larger different. There are also larger different on the number of window comparing. The most important influencing factors on efficiency of algorithm are the occurring probability of the maximum shift distance and the number of window comparing. Because the occurring probability of the good-suffix function is lower, its role is often ignored. Therefore, when a character in text aligning with last character in the pattern doesn't occur in pattern, BM algorithm will occur the maximum shift distance.

When next character of a character in text aligning with last character in the pattern doesn't occur in pattern, BMHS algorithm will occur the maximum shift distance. BMI algorithm will occur the maximum shift distance under below situations. When Next-Character doesn't occur in pattern; Or when Last-Character doesn't occur in pattern; Or when the combination of Last-Character with Next-Character doesn't occur in pattern.

Therefore, the occurring probability of the maximum shift distance in BMI algorithm is large than others. Under best performance the time complexity of BM and BMH algorithm all are O(n/m), the time complexity of BMHS and BMI algorithm all are O(n/m+1), but the average time complexity of BMI algorithm is better. Synthetically considered above factors, the BMI algorithm has some advancement over increasing matching speed than other algorithms.

POSSIBLE OUTCOMES

- The Graphical PML Editor uses metadata in PalCom to make qualified suggestions of graphical components that can represent the functionality components (commands, parameters, etc.) selected by the user.
- Solution on the PalCom framework to handle the network-oriented problems of such development
- An efficient approach for developing GUIs for Pal Comsystems
- Truly enable end-users to build GUIs for the systems they assemble.

CONCLUSION

This paper outlined health issues that traditional health care models are facing problems such as increase in chronic diseases and rise in hospital services. To decrease pressure on hospital system and healthcare providers, improve the quality of care and to keep hospitals hygiene.This paper reviewed recent IOT studies and presented ICT solution for solving the HAI problem.

FUTURE WORK

The current work can also extend further to the rate infections level more accurately and to monitor patients diseases caused by infections.

REFERENCES

[1]. S.Balachandar , R.Chinnaiyan (2018), Centralized Reliability and Security Management of Data in Internet of Things (IoT) with Rule Builder, Lecture Notes on Data Engineering and Communications Technologies 15, 193-201.
[2]. S.Balachandar , R.Chinnaiyan (2018), Reliable Digital Twin for Connected Footballer, Lecture Notes on Data Engineering and Communications Technologies 15, 185-191.
[3]. S.Balachandar , R.Chinnaiyan (2018), A Reliable Troubleshooting Model for IoT Devices with Sensors and Voice Based Chatbot Application, International Journal for Research in Applied Science & Engineering Technology,Vol.6,Iss.2, 1406-1409.
[4]. M. Swarnamugi ; R. Chinnaiyan, “IoT Hybrid Computing Model for Intelligent Transportation System (ITS)”, IEEE Second International Conference on Computing Methodologies and Communication (ICCMC), 15-16 Feb. 2018.
[5]. M. Swarnamugi; R. Chinnaiyan, “Cloud and Fog Computing Models for Internet of Things”, International Journal for Research in Applied Science & Engineering Technology, December 2017.
[6]. G Sabarmathi, R Chinnaiyan (2019), Envisagation and Analysis of Mosquito Borne Fevers: A Health Monitoring System by Envisagative Computing Using Big Data Analytics, Lecture Notes on Data Engineering and Communications Technologies book series (LNDECT, volume 31), 630-636. Springer, Cham
[7]. S. Balachandar, R. Chinnaiyan (2019), Internet of Things Based Reliable Real-Time Disease Monitoring of Poultry Farming Imagery Analytics, Lecture Notes on Data Engineering and Communications Technologies book series (LNDECT, volume 31), 615- 620. Springer, Cham

[8]. M Swarnamugi, R Chinnaiyan (2019), IoT Hybrid Computing Model for Intelligent Transportation System (ITS), Proceedings of the Second International Conference on Computing Methodologies and Communication (ICCMC 2018), 802-806.

[9]. G. Sabarmathi, R. Chinnaiyan (2016) , Big Data Analytics Research Opportunities and Challenges - A Review, International Journal of Advanced Research in Computer Science and Software Engineering, Vol.6 , Issue.10, 227-231