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ELECTRONIC NOTICE BOARD USING RASPBERRY PI

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Abstract: *Notice sheets can change the route correspondence with one another, utilizing notice sheets is a valuable technique for elevating significant data to countless individuals. Notice board is in a perfect world valuable apparatus for sorting out and showing data, these are utilized in large number of organizations, for example, schools, universities, emergency clinics, railroad station, bus stop, lodgings, shopping centres and so on .As they can be utilized again and again to show significant notification or promote prospective occasions or meeting. In this paper, we proposed an early notification load up in which whenever we can include or expel or adjust the message as indicated by our prerequisite. The primary point of this proposed venture is to radically diminish the cost in question, devour littler measure of intensity and help in accomplishing nature of administration. For this we need a PC/PC as a transmitter, Raspberry PI 3 model B as a recipient, Wi-Fi for information transmission and a LCD screen as a showcase.*

Keywords **-** Raspberry pi card, Light Emitting Diode (LED), Liquid-Crystal Display (LCD), Wireless Fidelity (Wi-Fi).

1. INTRODUCTION

Notice sheets can change the route correspondence with one another, utilizing notice sheets is a productive technique for elevating significant data to countless individuals. Notice board is in a perfect world valuable device for arranging and showing data, these are utilized in huge number of organizations, for example, schools, universities, emergency clinics, railroad station, bus stop, inns, shopping centers and so forth. As they can be utilized again and again to show significant notification or publicize expected occasions or meeting. Numerous new correspondence advancements have been created over the most recent few decades. Sharing data is the fundamental aphorism of any correspondence innovation. A section from sharing data, innovation has developed so that, the work areas and electronic apparatuses are gotten to remotely. Notice Boards are a significant vehicle for showing data and keeping individuals mindful. The customary notification blocks include the sticking of printed or written by hand data on a board.

The computerized hardware notice board is rapid option than the customary sort of notice board. This thought can show different notification at once to the quantity of clients. This thought with a plan to build the ease of use of electronic notification sheets, manages remote gathering and show of notification utilizing Raspberry-Pi. Notice-board is a thing that can be utilized in different spots like any establishment or open utility spots. The best approach to digitize the notification board is important in light of the fact that conventional notification board required, separate individual for sticking or staying sees on the board and wastage of paper printer-ink and so forth. Right now have proposed a framework which will empower individuals to remotely transmit sees on notice board utilizing Wi-Fi. It require less time because of quick information transmission through Wi-Fi. Less expense and spare the assets like paper.

The table 1 condenses the key contrasts between the three short range remote advancements. Wi-Fi gives higher information rates to interactive media access when contrasted with both Zigbee and Bluetooth which gives lower information move rates. Zigbee and Bluetooth are proposed for correspondence (about 10m), while Wi-Fi and Zigbee is intended for WLAN about 100m.

Table 1: Comparison of Bluetooth, Zigbee and Wi-Fi Protocols.

Standard	Bluetooth	Zigbee	Wi-Fi
Application Focus	Cable replacement	Monitoring and control	Web, E-mail and Video
Frequency Band	2.4 GHz	868.915MHz, 2.4GHz	2.4GHz, 5GHz
Max Signal Rate	1Mb/s	250Kb/s	54Mb/s
Nominal Range	10m	10-100m	100m
Channel Bandwidth	1MHz	0.3/0.6MHz,2MHz	2.2MHz

2. PROPOSED METHOD

Basic outline gives a raised level graphical point of view on the application plan and helps with perceiving applications, parts, databases and organizations. It is portrayed as key structure. The compositional arrangement of Digital Notice Board involves executive, who has the advantage to make a record, update sees and eradicate a record while the recommender/approver propose the notice of endorsed customer and asserts the warning of affirmed customer. Affirmed customer makes the warning and appropriates the notice resulting to getting support from the recommender/approver. Watcher has advantages to see sees from the affirmed customer. The watcher (Actor) is any individual who intends to examine notice on the Digital Notice Board. As showed up in the Block layout, the checked

customer has a full choice to send information, (for instance, Notices, Images, Videos, etc.) to the database. The Raspberry Pi gets the significant information in the database and introductions it on the specific LCD shows or screens

The proposed structure is executed by the building layout showed up in Fig.1. It contains 3 areas specifically the graphical UI, functionalities and the database the board structures. We hope to run the Digital Notice Board as a program that can be seen cautiously with no specific zones. For the way that the warning board program runs on PCs related.

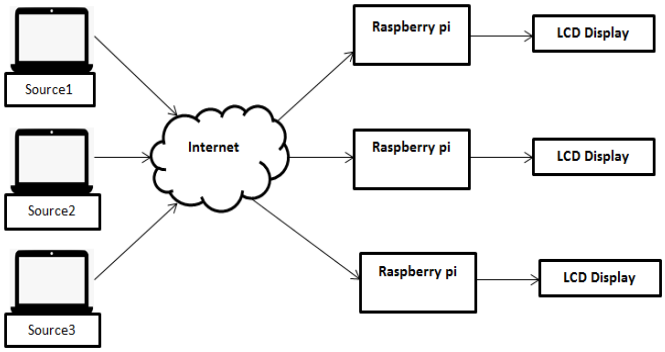

Figure 1: Proposed system.

The arrangement that we have embraced comprises of the misuse of the Raspberry pi card. It is a solitary nano PC card ARM processor planned by planner David Braben computer games, as a major aspect of its establishment "Raspberry pi". The accompanying photograph presents the Raspberry pi card. This PC has the size of a Mastercard, permits the execution of a few variations of the free working framework GNU/Linux and good programming. It is provided uncovered (single motherboard, without lodging, power gracefully, console, mouse and screen) with the intend to diminish costs and empower the utilization of recuperation hardware. Around the focal part, there are various connectors for interfacing gadgets to cooperate with the PC and scope of associations offered by GPIO Pins.

The Raspberry-Pi has two video yield choices composite (Radio Corporation of America - RCA) and High-Definition Multimedia Interface (HDMI). Show screens with VGA port can likewise be utilized by utilizing HDMI OUT of the Raspberry pi with a HDMI to Video Graphics Array (VGA) convertor. Hence, the proposed technique is adaptable as for show choices. The working framework utilized in Raspberry-Pi is Raspbian.

The most famous programming language for Raspberry Pi is Python. It is an elevated level language and in this way lesser coding exertion is required when contrasted with utilizing low level computing construct for other microcontroller sheets. Along these lines, the strategy proposed in this paper has a few favourable circumstances over the common techniques used to offer a similar usefulness.

This will be a moving message show, which may be used as the computerized notice board, and in addition a Wi-Fi handset, that can't avoid being that the latest development used for correspondence between the portable and furthermore the inserted gadgets. Framework can work like once the client wants to show or update the notification board, that is impossibly helpful to show the hangouts, step by step events, plans are to be appeared. By then the WI-FI will get the message in notice board framework, the Raspberry Pi chip has been inside the framework is customized in such away that when the coding is written in inserted framework Language gets any message it will peruse the message structure sequential port through WI-FI handset, on the off chance that the message is writing in any PC, at that point it will start showing the data inside the presentation framework. The messages are shown on the fluid precious stone showcase. This framework is to decrease the time wastage and update with whenever is to awfully essentially. The sequential WI-FI has been used it tends to be utilized to transmit a data from sequential port correspondence. It infers that to show the data from to a little piece at once to get the notification load up then stores it, messages are then shows it in the LCD module.

3. FRAMEWORK

- Here Laptop/Computer is utilized to send the notice, the Raspberry Pi gets the notification through web and it is utilized to show up on the LCD show up.
- Wi-Fi or Ethernet interface is utilized for Data transmission.
- The required upbraiding are transmitting from the evident source to the raspberry pi through web and put aside it in a particular envelope.
- Raspberry pi is changed to show the record put aside in express envelope, consistently continually with fitting time opening on LCD show up.
- The record put aside in show facilitator is composed by a program.

4. HARDWARE REQUIREMENTS

Raspberry pi 3 model b

The raspberry pi is a movement of minimal single-board pcs made in the assembled realm by the raspberry pi establishment to propel the training of key programming building in schools and in making countries. The course of action that we have gotten involves the abuse of the raspberry pi card. it is a singular Nano computer card arm processor organized by organizer david braben pc games as a segment of its foundation raspberry pi.

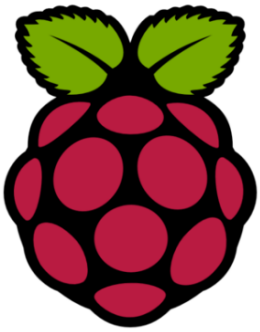

Figure 2: Raspberry Pi Model

A few times of raspberry pis have been released. its depiction seems as though a raspberry normal thing as showed up in figure 2. the principle raspberry pi 1 model b was released in february 2012. it was trailed by a less infuriating and unnoticeable model a. in 2014 the foundation released a board with an improved structure in raspberry pi 1 model b+. These sheets are generally credit card surveyed and address the standard mainline structure factor. improved a+ and b+ models were released a year later. a register module was released in april 2014 for introduced applications and a raspberry pi zero [5] with humbler size and decreased data/yield I/o and all around huge information/yield GPIO limits was released in november 2015 for us$5. The raspberry pi 2 which included more beat was released in february 2015. Raspberry pi 3 model b released in february 2016 is bundled with locally accessible wi-fi bluetooth and USB boot limits. As of january 2017 raspberry pi 3 model b is the freshest mainline raspberry pi. single motherboard without housing power deftly comfort mouse and screen with the hope to reduce costs and interface with the utilization of recovery gear. around the central part there are different connectors for interfacing contraptions to connect with the pc. the level of affiliations offered by the raspberry pi card is given by the going with figure4.

Figure 3: Raspberry Pi 3 Model B

Figure 4: Pin Diagram of GPIO Pins

The hardware diagram of Raspberry Pi 3 Model B is shown in Figure 3. A brief description of the components on the Pi is given below. Figure 4 Pin Diagram of GPIO Pins Most computers have an I2C bus, presumably for some of the purposes listed by Wikipedia, such as interfacing with the RTC (real time clock) and configuring memory. However, it is not exposed, meaning you can't attach anything else to it, and there are a lot of interesting things that could be attached pretty much any kind of common sensor (barometers, accelerometers, gyroscopes, luminometers, etc.) as well as output devices and displays. We can buy a USB to I2C adapter for a normal computer, but they cost a few hundred dollars. We can attach multiple devices to the exposed bus on the pi.

Wi-Fi Router

Far away consistency wi-fi is an improvement that licenses electronic gadgets to interface with a distant LAN WLAN compose the most part utilizing the 2.4 gigahertz 12 cm uhf and 5 gigahertz 6cm SHF ism radio social occasions. a WLAN is normally riddle express ensured about yet might be open which permits any gadget inside its range to get to the advantages of the WLAN arrange .the wi-fi switch is appeared underneath in figure 5.

Figure 5: Wi-Fi Router

The Wi-Fi Alliance characterizes Wi-Fi as any "remote neighbourhood" (WLAN) item dependent on the Institute of Electrical and Electronics Engineers' (IEEE) 802.11 norms. Nonetheless, the expression "Wi-Fi" is utilized as a rule English as an equivalent word for "WLAN" since most current WLANs depend on these measures. "Wi-Fi" is a trademark of the Wi-Fi Alliance. The "Wi-Fi Certified" FF trademark must be utilized by Wi-Fi items that effectively complete Wi-Fi Alliance interoperability accreditation testing. Gadgets which can utilize Wi-Fi innovation incorporate PCs, computer game consoles, PDAs, computerized cameras, tablet PCs and advanced sound players. Wi-Fi perfect gadgets can associate with the Internet by means of a WLAN arrange and a remote passageway. Such a passageway (or hotspot) has a scope of around 20 meters (66 feet) inside and a more prominent range outside. Hotspot inclusion can be as little as a solitary live with dividers that square radio waves, or as extensive the same number of square kilometres accomplished by utilizing various covering passages.

SD Card

A SD card is imperative to present the OS and extra the data got from sender.

Figure 6: SD Card

Liquid-Crystal Display (LCD)

A Light Emitting Diode (LED) show is a level board show, which utilizes a variety of light-producing diodes as pixels for a video show. Their splendor permits them to be utilized outside in store signs and boards, and as of late they have likewise gotten ordinarily utilized in goal signs on open vehicle vehicles. Driven presentations are equipped for giving general enlightenment notwithstanding visual showcase, as when utilized for stage lighting or other beautiful (instead of instructive) purposes [6]. A Liquid-Crystal Display (LCD) is a level board show or other electronically tweaked optical gadget that utilizes the light regulating properties of fluid precious stones. Fluid precious stones don't emanate light straightforwardly, rather utilizing a backdrop illumination or reflector to deliver pictures in shading or monochrome.

Figure 7: LCD Display

LCDs are accessible to show discretionary pictures (as in a universally useful PC show) or fixed pictures with uninformed substance, which can be shown or covered up, for example, present words, digits, and 7-section shows, as in a computerized clock. They utilize a similar essential innovation then again, actually discretionary pictures are comprised of countless little pixels, while different presentations have bigger components. Any HDMI/DVI screen and any TV appeared in Figure 7 should fill in as a showcase for the Raspberry Pi.

USB Keyboard and USB Mouse

The USB Keyboard and USB Mouse are used initially for installing the OS into SD Card.

PC/Computer with Windows OS

Here just a PC/Computer with Windows OS can be utilized as transmitter on the grounds that the PSCP programming underpins just Windows OS on the Server side.

Power Supply

The Power Supply is an essential prerequisite for the venture work. The necessary DC power flexibly for the base unit just as for the reviving unit is gotten from the mains line. For this reason place tapped optional of 12V-012V transformer is utilized. From this transformer we get 5V power flexibly. In this, +5V yield is a controlled yield and it is planned utilizing 7805 positive voltage controller. This is a 3 Pin voltage controller, can convey current up to 800milliamps. Amendment is a procedure of rendering an exchanging current or voltage into a unidirectional one. The part utilized for correction is called 'Rectifier'. A rectifier

grants current to stream just during positive half patterns of the applied AC voltage. In this way, throbbing DC is gotten to acquire smooth DC power extra channel circuits required. The force flexibly comprises of a stage down transformer, full wave rectifier, capacitive channel, 7805 controller.

Hardware Setup

- Connect the Ethernet cable from the Ethernet connector of the raspberry-pi to router. Internet connection should be working. We need to do this only first time when setup raspberry-pi, so that program can update itself to the latest version. Updates are enabled by default and can be disabled later when we want.

- Connect the HDMI cable from the HDMI connector on raspberry-pi to the HDMI connector on TV.

- Plug the SD card into slot on the slot on the underside of the raspberry-pi. SD card should pushed all the way in so that it is making a good contact with the connectors.

- Plug the adaptor from keyboard touchpad media controller into a USB port on raspberry-pi. Finally, insert the micro USB power supply. This will automatically boot the raspberry pi up. It shows raspberry-pi logo after successful installation.

5. SOFTWARE REQUIREMENTS

Python

Python is a universally useful, significant level programming language. Its plan accentuates code meaningfulness, and punctuation permits software engineers to communicate ideas in less lines of code. Python highlights both a unique kind framework and programmed memory the board. Python underpins different programming paradigram. It highlights programmed memory the executives and has a standard library. Python translators are accessible for establishment on many working frameworks. Python was intended to be profoundly extensible.

Raspbian OS

The objective of Raspbian is to turn into the main OS of decision for all clients of the Raspberry Pi. This objective has been to a great extent accomplished. There are still some unpleasant edges yet these are commonly increasingly identified with the Pi's equipment and part than Raspbian itself. Raspbian attempts to remain as near to Debian as sensibly conceivable. Debian is utilized by a huge number of clients around the world regularly and there is a huge store of information and documentation about utilizing Debian over the web. Any data you find that applies to Debian will more likely than not make a difference to a similar variant of Raspbian. Data for prior forms of debian will frequently apply as well yet may require a few changes similarly as it would when use it on a more up to date form of debian. Debian is a free working framework for your PC and incorporates the fundamental arrangement of projects and utilities that make your PC run alongside a large number of different bundles.

6. GUI FOR RASPBERRY PI

Adding a GUI to your program lets the customer associate with it using gets, menus, content boxes, and other common UI features. We use successive request line and programming PuTTY to give a request in the Raspberry Pi. we will use Remote Desktop Connection as our interface to program Raspberry Pi. We regardless of everything need PuTTY programming to set up a WiFi dongle and access the Raspbian request brief.

Here we are using the phase for GUI Interfacing is VNC server Virtual Network Computing (VNC) is a graphical work a zone sharing structure that uses the Remote packaging support protocol(RFB) to distantly control another PC It transmits the comfort and mouse events beginning with one PC then onto the going with, moving the graphical screen animates back the other way, over a system.

Vitural Network Computing VNC Server.

VNC is stage self-ruling there are clients and servers for a few GUI-based working structures and for java. Different clients may interface with a VNC server at the same time. Notable uses for this development consolidate distant specific assistance and getting to reports on ones work pc from ones home pc or the opposite way around.

VNC was at first advanced at the Olivetti and oracle research lab in Cambridge United Kingdom. The first VNC source code and various forefront auxiliaries are open source under the gnu general public license. there are different varieties of VNC which offer their own particular convenience; e.g. some smoothed out for Microsoft windows or offering archive move not part of VNC authentic etc. many are great without their extra features with VNC real as in a watcher of one flavor can connect with a server of another; others rely upon VNC code anyway not great with standard VNC.

- The VNC server is the program on the machine that shares some screen and allows the client to share control of it.
- The VNC client or watcher is the program that addresses the screen data starting from the server gets revives from it and evidently controls it by lighting up the server with respect to assembled neighborhood input.

- The VNC show is clear considering transmitting one reasonable rough from server to client and event messages from client to server.
- Genuine VNC server
- Home free enlistment and commencement required professional business version furnished towards home or private endeavor customers with check and encryption far off printing visit and record move
- Enterprise business version furnished towards attempts with improved approval and encryption far off printing visit record move and request line sending.

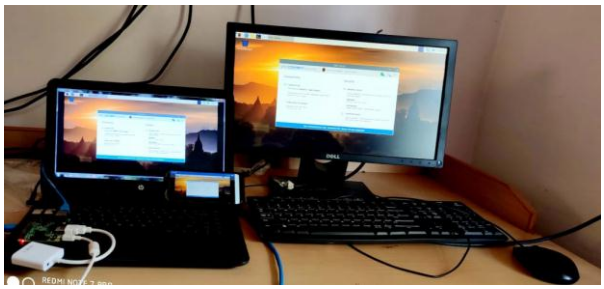

Figure 8: VNC server for remote accessing control

PDF Viewer

Various people these days lean toward using PDF records considering the way that various on-line reports and books by and by come in structure PDF archives. In this manner getting a PDF watcher that tends to your issues is basic.

QPDF is a program that does essential, content-sparing changes on PDF records. It could have been called something like pdf-to-pdf. It is like manner gives various supportive abilities to designers of PDF-making programming or for people who essentially need to look at the innards of a PDF archive to get comfortable with how they work. With QPDF, it is possible to copy things from one PDF record into another and to control the once-over of pages in a PDF archive. This makes it possible to solidification and split PDF reports.

Image Viewer

Display Images In the Terminal Using FIM, FIM represents FBI Improved. For the individuals who don't have a clue, FBI is a Linux frame buffer image viewer. It utilizes the framework's frame buffer to show pictures straightforwardly from the order line. Of course, it shows bmp, gif, jpeg, Photo CD, Png, ppm, tiff, and xwd from the Terminal itself. For different arrangements, it will attempt to utilize ImageMagick's proselyte. The FIM utility draw my consideration, since it is lightweight contrasted with most GUI picture watcher applications.

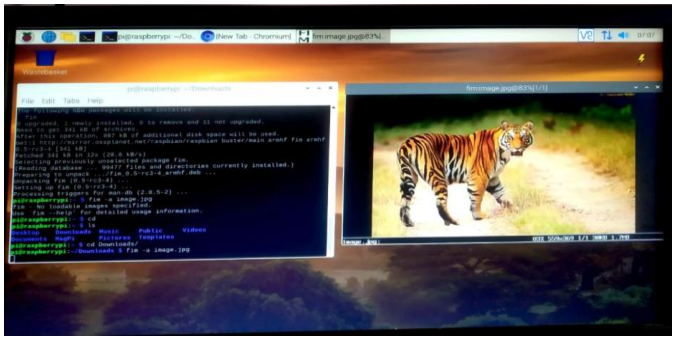

Figure 9: Image displayed on monitor

7. CONCLUSION

By utilizing the idea of this innovation in the field of remote correspondence we can make our correspondence efficient and quicker. We can show the messages with less mistakes and better effectiveness. Time utilization and paper wastage is decreased. This technique can be utilized proficiently in foundations like innovative eateries to provide the request, in shops offer limits can be shown, at all branches in schools the understudies and staffs can be educated at the same time simultaneously. Likewise it very well may be set up at open vehicle places like railroads, bus stop, air terminal and furthermore at street side for traffic control and in crisis circumstances like medical clinics, sanctuaries and so forth. Its expense is low and it tends to be dealt with without any problem. Utilizing this application we can maintain a strategic distance from the utilization of papers consequently cutting of trees with the end goal of papers is significantly decreased.

8. EXPERIMENTAL SETUP AND RESULTS

The proposed structure was totally developed and attempted to display its feasibility and sufficiency. In this paper, we have used the PC as transmitter to send the notice and Raspberry Pi 3 model is used as gatherer. Exactly when both the transmitter and recipient are related with a comparative framework, by then the notice are appeared on the screen.

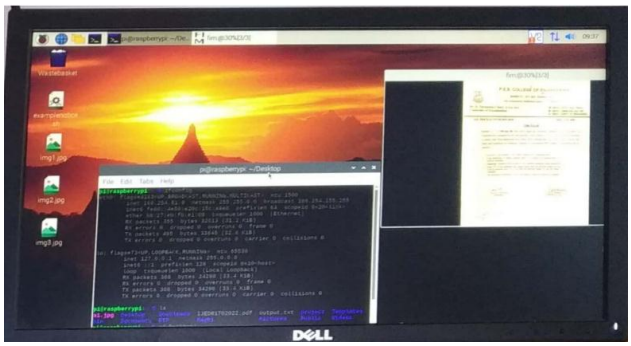

Figure 10: Experimental Setup

They are appeared in a consistent movement following 5 seconds delay. We can incorporate or oust the notice at whatever point. The Raspberry Pi is related with the screen through HDMI to VGA converter as showed up in the figure. The deftly to the Raspberry Pi is furthermore given. From the start comfort and mouse are used to work the screen show.

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REFERENCES

[1]N. Villar, K. VanLaerhoven, H.-W. Gellersen. "A Physical Notice Board with Digital Logic and Display", (Demo). In Adjunct Proceedings of the European Symposium on Ambient, 2007.

[2]Jeff Brown, Bill Shipman and Ron Vetter, ―SMS: The Short Message Service‖, IEEE Computer Society, pp.106- 111, December, 2007.

[3]Jesus Ibanez, Oscar Serrano, David Garcia, and Carlos Delgado-Mata, ||Memetic Board: A Notice Board with Spatio-temporal Memory, Edutainment, 2008.

[4]S. W. Ambler, "The Object Primer: Agile Model Driven Development with UML 2", Cambridge University Press, 2004.

[5] Michael Baha, James Rumbaugh, Object-Oriented Modelling and Design with UML. Addison-2nd Edition, Pearson Education, 2005.

[6]F. Halsall. ―Data Communication, Computer Networks and Open Systems (4th Edition) ‖, Addison Wesley Publishers Limited, 1996.

[7]J. Callaghan, ― Inside Intranets and Extranets: Knowledge Management and the Struggle for power", Palgrave Macmillan, 2002.

[8]SA Shi-Xuan, WANG Shan, Introduction to Database Systems, Higher Education Press, Beijing, 2002.

[9]. N. Villar, K. Van Laerhoven, H.-W. Gellersen. "A Physical Notice Board with Digital Logic And Display", (Demo). In Adjunct Proceedings of the European Symposium on Ambient, 2007

[10]. Wireless electronic display board using gsm technology 1n. jaganmohanreddy, 2g.venkareshwarlu. cbit, Hyderabad

[11]. Electronic Notice Board for Professional CollegeAnushree S P, Divyashree V Bhat, Moonisha G A Venkatesh U C.

[12]. "GSM based campus display system"(using microcontroller a at89s52) bachelor of engineering in electronics & communication L.D.R.P Institute Technology & Research, G GandhinagarGujaarat Technological University, Ahmedabad December, 2012

[13]. HaitaoJia, Li Cao Department of Automation, Tsinghua, and Beijing, China "A Remote data acquisition system based on SMS". Systems, Man and Cybernetics, 2004 IEEE International Conference on(Volume: 7)

[14]. Dawood.R.Muchallil. S.Munadi, K.JurusanTek. Elektr, University. Syiah Kuala, Banda Aceh, Indonesia "An SMS Based Learning System."Teaching, Assessment and Learning for Engineering (TALE), 2013 IEEE International ConferenceAug. 2013