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IO2TX

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ABSTRACT

Hospital condition is synonymous with a busy environment where there are many patients that nurses should give the services to. The busy schedule makes the nurses not aware to refill the items in the treatment cupboard. Besides, the items in the treatment room are always out of stock when nurses need to use it and have to find the item first. This situation will delay the treatment time and patients should wait for a long time for nurses to prepare for the equipment that they need for a certain procedure. Items out of stock in the treatment room will take a long time to be refilled. Our project, named IO2TX, has been invented to solve this problem. IO2TX is using sensors to detect the quantity of the items such as syringes, needles, alcohol swabs and other items in the treatment cupboard. IO2TX acts as a reminder for nurses when the items in the treatment cupboard went out of stock by action of light-emitting diode (LED) light will blink and display items that are out of stock in the liquid crystal display (LCD) at the cupboard door. Without a device to remind the nurses when the item in the treatment room is near to out of stock, this can lead to hectic conditions when nurses just realize it when they want to provide treatment for the patient. Therefore, the innovation that we created can help nurses be more aware before the items in the treatment room are out of stock. In addition, this will facilitate the work of nurses while having a systematic and manageable system in the hospital. The cost for development of the product is RM 100.

Keywords: IO2TX, LED light, LCD, items

PROBLEM STATEMENT

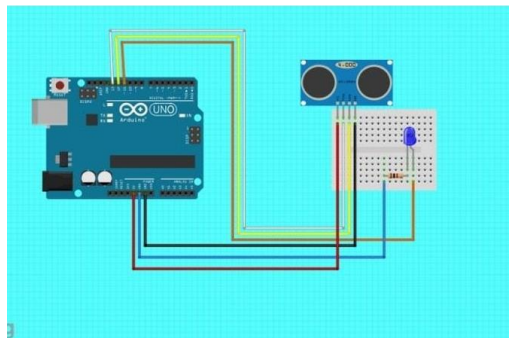
The problems that influenced us to design this innovation called IO2TX is because when we went to hospital for practicals, the problem that we faced was items in the treatment room were always out of stock. The nurses were not alerted to refill the items as they have a busy schedule especially during this pandemic Covid-19. The case rises day by day, making the nurses must

deal with hectic days and difficult to be aware of this condition without any reminders. The items that are always out of stock during this pandemic are usually personal protective equipment (PPE). When this condition happens, then we have to delay the treatment and make the patients wait for a long time to finish the procedure. During the practical, we had one case where we had to delay the procedure because the alcohol swab in the treatment room was out of stock. So, we made the patient waited for us to find the items in other wards to perform the procedure. This is where we get an idea to develop this kind of innovation. The target group of this product is for the nurses and other health care providers. The creation of this product will also influence the hospital management system and further improve the quality services of nurses and other healthcare providers. Besides, it also can improve nurses' work and provide better services to the patients. Therefore, this innovation can help in reminding the nurses to be more alert in refilling the items in the treatment room before they are out of stock.

EXPLANATION ABOUT THE PRODUCT

IO2TX is a special type of product with the ability to detect items through sensors. The software that we use to conduct this project is Arduino and Blynk. Arduino usage is for coding and Blynk's purpose is to send the notification to LCD and computer. Hardware items that we use are LCD, LED, Arduino breadboard and ultrasonic sensor. LCD function is to visualize the notification when the item is running out of stock while LED will blink if the item is near out of stock. Next, an Arduino breadboard is used to connect all the wire through it and an ultrasonic sensor will detect the quantity of items in the box. IO2TX continues to connect to the IOT cloud and transmit data to the cloud. Using the BLYNK application allows users to visualize data (have items or not) and provide notifications when the items such as syringes are running out. In addition, the LED will blink and the cupboard will display the current items using the LCD when the items are near to run out. The main objective of the project is to help nurses and other health care providers to solve problems in keeping track of items in the treatment room. With the help of this product, nurses will notice if the items ran out in the treatment cupboard as BLYNK application will send notification to them via computer.

The ultrasonic sensor usage depends on how many types of items to detect. For example, we use 3 ultrasonic sensors to detect three different types of items such as syringes, needles and alcohol swabs. When one of the items runs out as an example of syringes runs out, BLYNK application will send notification that syringe runs out. In addition, the LED will blink and the LCD and computer will display an ascending count to calculate the time of the absence of the item. Same as other items, BLYNK application will send notification, the LED will blink and the LCD and computer will display an ascending count to calculate the time of the absence of the items if items run out of stock.







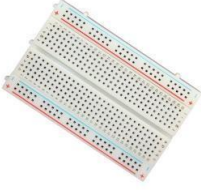

BENEFITS OF THE PRODUCT AND COMMERCIAL PRICE

The significance of the product is for nurses and other health care providers especially during this hectic condition which is pandemic Covid-19. This product will make it easier for nurses to be more alert to the items available in the treatment room. Therefore, the case for refilling items that are out of stock will not be disrupted and not delayed anymore. This will make the procedure for the patients can be done quickly without any delays. The estimated price for commercialization is about RM 120 – RM 150 for each product. This estimated commercial price is based on the capital price we have used for us to complete this product. Even the product is under prototype but the quality to be commercialized is highly recommended as the product can be a reminder for nurses and the needs in the ward.

COMPONENTS IN IO2TX

Components that we use in this project include software and hardware. Software that we use are Arduino and Blynk. Arduino is used for coding and Blynk to transmit data from sensor to LCD and computer. Hardware that we use are LED, LCD, ultrasonic sensor, resistors, jumper and breadboard.

HARDWARE

		
<p>Figure 1. Light-emitting diode (LED)</p>	<p>Figure 2. Liquid crystal display (LCD)</p>	<p>Figure 3. Resistors</p>
		
<p>Figure 4. Jumper</p>	<p>Figure 5. Breadboard</p>	<p>Figure 6. Ultrasonic sensor</p>

SOFTWARE



	
<p>Figure 7. Arduino</p>	<p>Figure 8. lynk</p>



Figure 9. IO2TX

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and indirectly to complete our IO2TX project.

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