OCEAN EXPLORATION USING AR AND VR

Ms. Padma Priya[1], Lalith Mohan C[2,] Haran M[3], Priyadharshini M[4], Sanjay R[5]

[1]Assistant professor, Department of Information Technology, SNS College Of Technology, Coimbatore, Tamil Nadu, India

[2,3,4,5] Student, Department of Information Technology, SNS College Of Technology, Coimbatore, Tamil Nadu, India

Abstract

Exploring the ocean is very difficult process, as it takes some practice to go inside the water atmosphere. This project mainly concentrates on the exploration of the underwater ocean environment and creating a virtual environment from which formation can be derived. It is achieved with the help of some mechanisms which also includes a ROV also called Remotely Operated Vehicles. Remotely Operated Vehicle (ROV) carrying a sealing mechanism attached to it. By using the information obtained, we can give some conclusions regarding many hazards and predict some disasters of the coastal areas. More than 80 percent of the ocean has never been mapped, explored, or even seen by humans. Exploring the ocean is important because it can help us to understand how we are affected and been affected by climatic changes. Also, it can help us in understanding and response to earthquakes, tsunamis and other coastal hazards. Technology used to explore outer space and the ocean ncludes submersibles, remotely operated vehicles (ROVs), satellites, rovers, diving/scuba gears, buoys, mega corers, column samplers and sonar for mapping. Among these Scuba diving is the most often used method to explore the ocean. Nowadays, there are not as many people to do scuba diving for exploring the ocean, and in another method the cost of ROVs is very high to afford. In this project we are creating an ROV using a 360-degree camera and some equipment to build our own ROV. By using this we can send the ROV underwater and capture the species in the ocean and also it is helpful in identifying the coastal hazards by sending signals to the nearby stations. It is very useful for the students who are just beginning to explore the ocean but couldn't afford such high prices as a beginner.

Keywords: **Crop yield prediction, IBM cognos Analytics, dashboards.**

1. Introduction

Ocean exploration is a part of oceanography describing the exploration of ocean surfaces. Notable explorations were undertaken by the Greeks, the Romans, the Polynesians ,the Phoenicians, Phytheas, Herodotus,the Vikings, the Portuguese and Muslims. Scientific investigations began with early scientists such as James Cook, Charles Darwin, and Edmund Halley. Ocean exploration itself coincided with the developments in shipbuilding, diving, navigation, depth, measurement, exploration, and cartography. The renaissance of ocean exploration occurred in the 20th century, when human- powered exploration became increasingly popular. Via this new medium, pioneering has once again become the goal of ocean explorers. This also includes Deep-sea exploration**,** is the investigation of physical, chemical, and biological conditions on the sea bed, for scientific or commercial purposes.

Deep- sea exploration is considered a relatively recent human activity compared to the other areas of geophysical research, as the depths of the sea have been investigated only during comparatively recent years. The ocean depths remain a largely unexplored part of the planet, and form a relatively undiscovered domain. In general, modern scientific deep-sea exploration can be said to have begun when French scientist Pierre Simon de Laplace investigated the average depth of the Atlantic ocean by observing tidal motions registered on Brazilian and African coasts. He calculated the depth to be 3,962 meters (12,999 ft.), a value later proven quite accurate by echo- sounding measurement techniques. Later on, due to increasing demand for the instalment of submarine cables, accurate measurements of the sea floor depth were required and the first investigations of the sea bottom were undertaken. The first deep-sea life forms were discovered in 1864 when Norwegian researchers obtained a sample of a stalked crinoid at a depth of 3,109 m (10,200 ft.).

2. Literature Survey

The oceans and great inland seas are widely recognized as among the few remaining frontiers of human discovery on our planet. History demonstrates that exploration results in discoveries of great value. Every ocean expedition has the potential to discover important information about the origins of life on earth, or new living or non-living resources that may have potential to benefit humanity. Recent progress in technology is enabling new initiatives. Ocean exploration assets and capabilities may one day rival those of space exploration, with potential for enormous economic, archeological; health, and quality of life benefits. The national need to explore the ocean and large inland lakes was an important rationale stated by the Stratton Commission in 1969 for establishing the National Oceanic and Atmospheric Administration (NOAA) as an organization

Analysis of ocean exploration:

In 1974, Alvin (operated by the Woods Hole Oceanographic Institution and the DeepSea Place Research Centre), the French bathyscaphe Archimedes, and the French diving saucer CYANA, assisted by support ships and Glomar Challenger, explored the great rift valley of the Mid-Atlantic Ridge, southwest of the Azores. About 5,200 photographs of the region were taken, and samples of relatively young solidified magma were found on each side of the central fissure of the rift valley, giving additional proof that the seafloor spreads at this site at a rate of about 2.5 centimetres (1.0 in) per year (see plate tectonics,).

In a series of dives conducted between 1979–1980 into the Galápagos rift, off the coast of Ecuador, French, Italian, Mexican, and U.S. scientists found vents, nearly 9 m (30 ft) high and about 3.7 m (12 ft) across, discharging a mixture of hot water (up to 300 °C, 572 °F) and dissolved metals in dark, smoke-like plumes (see hydrothermal vent,). These hot springs play an important role in the formation of deposits that are enriched in copper, nickel, cadmium, chromium, and uranium. Numerous biological samples have been collected during deep sea explorations, many of which turning out to be new to science or showing unexpected ecologies and biological relationships. An overview of these is provided in the editorial, in which deep sea exploration in biology takes central stage.

Overall, inventory is held to maintain confidence in the system. If stock-out occurs regularly, patients and medical personnel may lose faith in the system. On the other hand, holding a high level of inventory can lead to substantial investments on the excess inventory and create unavailability of capital for other purposes (Maestre et al., 2018). Therefore, it is necessary to hold inventory to ensure availability at the time of requirement. However, it is very challenging to accurately predict the demand in a healthcare system due to uncertainties and randomness, such as changing patient conditions, dynamics in physicians' prescriptions, and variation in responses of the individual patient to treatment procedures (Montoya et al., 2010, Vila-Parrish et al., 2012). Therefore, the development of optimal inventory control policy which allows absorption of such uncertainties and randomness is essential.

Inventory and monitoring process control system of medical supplies:

According to Mondal (2014), there are five key application of inventory management: demand forecasting, warehouse flow, inventory turns/stock rotation, cycle counting, and process auditing. The Management Science for Health (2012) explained that inventory management serves as the heart of pharmaceutical supply system as it helps to monitor the number of drugs and medical supplies to order, store, and procure, especially some items are limited in supplies and numbers in the market.

Awaya et al. (2005) discussed that automating and upgrading the drug distribution process provide innovations and advantages in terms of the services offered by pharmacists in most clinics. According to Wojcik et al. (1993), the arrangement of their creation oversees client orders utilizing supplier provided programming frameworks interfaced consistently to contact the information in every framework consistently. In a system developed by Vogler et al. (2002), tracking tagged items is the key component of monitoring the level of inventory, and even if an item is removed or added in the stocks. The items are tagged with unique digital identifier so that the operator or user of the system can monitor and track the arrival and destination of the items being inventoried. Muhammad (2016) enumerated two stages on the implementation of an automated inventory control system: programming stage and user training stage. In the programming stage, the programmer uses a specific program language and codes the necessary instructions to the program. On the other hand, user training stage aims to train and orient the concerned users. Irene (2011) highlighted that computerizing most of the businesses and service providers can maximize the profit, sales, and performance of the concerned organizations.

A proper implementation of systems is necessary to accomplish the desired goal of an inventory system. Nuyda et al. (2012) established an online inventory and monitoring system in Cagayan de Oro City that monitors the stock level and availability of medical supplies and medicines that will ensure an efficient and easier response to the requests sent to the health office. In Zhou and Olsen (2017) research, it was determined the perishability of medical supplies, which include gloves, masks, and medicines should not be ignored as it may affect the performance and serviceability of most health centers. Mustaffa and Potter (2009) identified two main issues; first, the urgent and immediate demand of medicines and other pharmaceutical needs, secondly, is the availability of stocks at the wholesaler. These issues led in the proposal of a new and improved design of supply chain system to address the problems encountered during the distribution of medicines from its suppliers.

1. METHODOLOGY

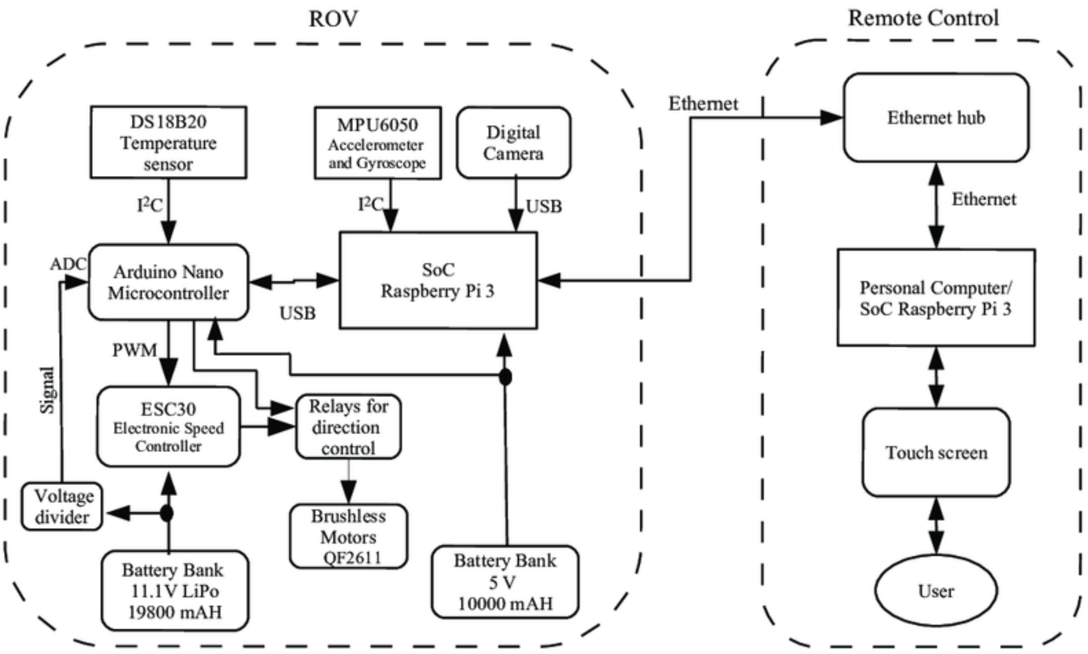

Fig.1. Work flow

1. At first, in need of the knowledge of the ocean bed and to know the hidden mystery of the history of the ocean, we deploy the rover that is built with the omnidirectional camera.
2. The rover or the vehicle that is with the camera deployed in the middle of the ocean by the mode of transport control over the camera. This camera is slightly modified using the remote sensors and it is made to be controlled from the boat that will be in the movement above the range of the camera.
3. It is also modified in the way that when it exceeds the range limit, it should be automated and to be return to the range limit. When the camera started to reach a distance from the boat it starts to take pictures and videos and uploads the data in the cloud immediately.
4. Then this data is retrieved from the cloud and processed into the information and fed to the VR box and its machines. This information is then catch up by the VR box and it creates the virtual environment that is similar to the original one. This environment is studied and the information is gathered for the studies.
5. There is also defence mechanisms that there is also some that are deployed along with the main one to monitor. At the South Shetlands Island, Antarctica most of the scientific stations have got small vessels, zodiac boats and easy-access to deep-sea waters, below1000 m, but is not possible to deploy large ROVs that can reach deeps more than 1000 m from a zodiac boat. A more affordable alternative are AUVs.
6. They don't depend on a physical connection to the surface vessel and can carry out a mission below the sea surface without human intervention.

4. Output:

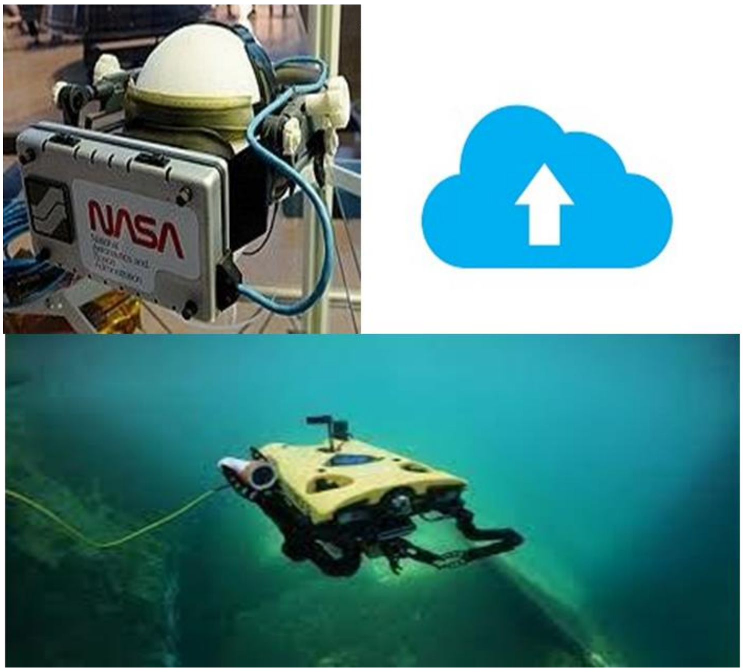

Fig. Remote sensors

7. CONCLUSION AND FUTURE WORK

Preventing inventory pitfalls removes time, cost, and staffing pressures so that hospitals can work in a proactive manner to provide optimum healthcare and run financially sound businesses. Effective inventory management is not an aspiration, it is achievable. In order to have a medical inventory supply chain that works for all parties and copes with the complex and unpredictable healthcare setting, the ideal solution is a bespoke inventory management system for hospitals. Healthcare inventory management needs a product that can meet its complex requirements, including high numbers of individual suppliers, high volume and a vast range of inventory items, and last-minute, urgent demands.

Conflicts of Interest

Authors must identify and declare any personal circumstances or interest that may be perceived as inappropriately influencing the representation or interpretation of reported research results. If there is no conflict of interest, please state "The authors declare no conflict of interest."

REFERENCES

1. Our Nation and the Sea – A Plan for National Action", Report of the Commission on Marine Science Engineering and Resources, January 1969.
2. "Discovering Earth's Final Frontier: A U.S. Strategy for Ocean Exploration", Report of the President's Panel on Ocean Exploration, October 2000.
3. Preliminary Report of the U.S. Commission on Ocean Policy Governor's Draft, April 2004.
4. M. Yoklavich, C. Grimes and W. Wakefield, "Using Laser Line Scan Imaging Technology to Assess Deepwater Seafloor Habitats in the Monterey Bay National Marine Sanctuary", Marine Technology Society Journal, vol. 37, no. 1, pp. 18-26, 2003.
5. R. White, "First Eyes in the Hidden Abyss", Sea Technology, vol. 43, no. 12, pp. 14-18, 2002.
6. S. Bernhardt et al., "Deep Sea Diary: NOAA Explores Coral Habitats in the Gulf of Mexico", Underwater, March/April 2004.
7. D. Crimmins and J. Manley, "joint Environmental Science Investigations for Coastal Security", Proceedings of Undersea Defense Technology 2004, October 2004.