Propose System Architecture Technology Hub for the New Normal in Sibuyan Island, Romblon (PSATH)

Nathanstee Q. Anayan and Virgil L. Penuela

Abstract—**The new era of technologies around the globe continues transforming the process of innovation particularly in the province of Romblon where the community is being active and updated about the trends of technology, however, due to the limited bandwidth signal of internet connection, their telecommunications are affected especially during this new normal where the Business Transactions, Learning Management System, and other Essential Services are done through online. The purpose of this study is to propose an IT business project especially a technology hub that will cater to and satisfy the needs of the community on the Island. The impact of this study is simply for connecting and moving people into the fastest and easiest way of communication using social media and other online platforms. The proposed Technology hub is composed of four areas, the Internet Café, Printing Press, Research Learning Area, and Photo Studio. This is very beneficial to the people in the community especially to the students that needs IT services. This study aims to help the people, the Local Government Unit, and the University to make their goals put into reality. This study will truly change and innovate the lives of the people even for the progress of the economy, culture, and lifestyle of the place. This study is also recommended for the implementation of Techno hub within the island since this could give an opportunity to give new jobs, especially for the IT professions. This is very responsive to the needs of the society in terms of socialization, communication, and education.**

Index Terms—**Internet café, photo studio, printing press, technology hub.**

I. INTRODUCTION

Saving nature and innovate the new technology are combined together for the advancement of the rural area in the province of Romblon. This is one way to preserve the reputation of the place, one must design and build a structure to reconnect the people to the environment while enjoying the technology. 'The current pace and nature of technological change and innovation in wider society is such that unless the industry embraces this trend at scale, it will miss the greatest single opportunity to improve productivity and offset workforce shrinkage'. [1] (This report was produced by NBS Research on behalf of Microsoft and RIBA. 2018.) Locals will enjoy lying on a soft grass of roof garden while connecting to people on social media. The proposed Technology hub is composed of four areas which are internet café, Printing Press, Photo Studio, and Research and Learning. For the floor, the Total Area of Internet Café 50.75 sq. m. with a Capacity: 14 pax and for the interior, each unit has its own acrylic barrier which serves as protection to the user.

The Total Area of Printing Press and Photo Studio is 50.75 sq. m. and the Total Area of Research and Learning is 81.75 sq. m. Information and communication technology is regarded as a critical means of addressing rural problems of information deficiency, ineffective communication, and emotional disconnection [2]. (Lisha Ye *et. al.* 2021). This techno hub is the first innovative business center located at Romblon State University San Fernando Campus San Fernando Romblon. This study focus on the System Architecture of a proposed IT business project for the improvement and advancement of technology on the Island. The importance of technology to the discipline and to the practice of architecture has been demonstrated again and again throughout history. In the 21st century, the advent of computer-aided design, computer assisted collaboration, construction automation, "intelligent" buildings, and "virtual" places, promise to have as much of an impact on architectural design processes and products as earlier technological advances have had [3]. (Yehuda E. Kalay). The researcher tends to pursue this project to help improve the information technology facilities and help the community to develop their digital skills especially of every youth in general. Barangay Poblacion San Fernando is one of the Municipality in the province of Romblon in which the people are equipped with the new advanced technology and active in social media Platforms however due to the weak internet connectivity and signal they often encountered difficulties for the communications, printing of important documents and digital photo services. The growing pervasiveness of technology is driving firms to experiment in balancing organizational desires, technological power and human needs [4]. (Julie Wagner *et. al.* 2017) The researchers propose a total package IT business center that cater the needs of the community like Internet café, this will satisfy the clients' needs by experiencing fast internet using the latest antenna for long-wavelength signal and frequency and using satellite internet connection is the most high-speed access links coverage at any location. It is often the main channel of voice communication for rural areas. Printing Press where the Students will not spend a lot of time, effort and big amount of money to travel and go to other near provinces or region just to print their school outputs, thesis books and other printing services they might need. Digital technologies have spread rapidly. Digital dividends the broader development benefits from using these technologies have not. Digital technologies to benefit everyone everywhere requires improving the "analog" complements to digital investments by strengthening regulations that ensure competition among businesses, by adapting workers' skills to the demands of the new economy, and by ensuring that institutions are

accountable [5]. (Dr. Tim Kelly, 2016)

A Photo Studio, this photo studio is not available in the area so this is very useful especially in taking the picture for the School ID, Graduation Pictorial, and Souvenir picture, Year Books, and other special occasions. And Research and Learning Area where the students are comfortable and stress-free. The business uses point to point antenna with a 5 GHz or 2.4 GHz radio transceiver. The radio technology has a better performance-based in-network device provider. The network topology to be used is the combination of bus and star topology. The internet will be getting from the main service provider and then it will be shared using a private network. As linkages of the University to the Local Government Unit both organizations are encouraged to help support the finances for the success of this project.

The changing nature of innovation is transforming spaces into open, flexible locales where separate professions and disciplines more easily converge. The changing demographic of workers is altering designs to be more comfortable, social, and collaborative with technology. For these and other reasons, spaces of innovation help elevate what matters in today's economy, making them the places to watch, and sending helpful signals to cities and suburbs aiming to become more competitive [4]. (Anne T. and Robert M. 2014). This proposed project is very beneficial among the students and stakeholders of the university and also the entire community. The core of the innovation hub will be the digital innovation hub platform. This digital Innovation Hub will also support the sharing of information with other projects and initiatives [6] (. Karel Charvat *et al.* 2019). The business goals and objectives for this project will focus on implementing a technology hub that will improve the fast internet connection using an antenna for long-wavelength signal and frequency using satellite internet connection which considered as the most high-speed access links coverage at any location in rural areas. This project was designed as a strategic plan to lessen the burden of the students and stakeholders especially in the printing and digital photo services. It includes setting targets that are aligned in IT Business strategy. This project may also be expanding into a new market and becoming more sustainable in the industry standards that provide an open, flexible, reliable technology hub based for the future.

II. METHODOLOGY

The paper proposes an understanding of innovation for development as (often unequal) social processes which might contribute to human development if and when the people involved perceive value in the processes, and these values include improving their own communities and society [7]. (Tech hubs, innovation and development: Yingqin Zheng *et al.* 2017). In designing and developing the proposed system architecture of Technology hub for the new normal in sibuyan Island Romblon it requires extensive in-depth information about individuals' subjective interpretations and how they observe their social reality [8]. Ritchie and Jane, 2003 stated that we have chosen to conduct interviews as the source of evidence and the main data collection method in this research. More specifically, in-depth and semi-structured interview were carried out when collecting the data.

Interviews were conducted as guided conversations rather than fully structured queries with open-end questions. The reason for employing this method is that unstructured interview allows greater flexibility in discovering understandings and meaning. The researchers will employ this research method since the study will be conducted by interview, and observations. The researchers analyse the design of the proposed study and choose the appropriate methodology as the foundation of the study. The researcher sent a communication letter to the school administration to conduct a research about IT business plan project. Set an appointment meeting to the RSU-SFC and local government Unit for the interview regarding on the problem encountered in the internet connectivity. A developer used schedule in making the IT Project Plan. It follows time frame with different task to be completed with the used of Gantt chart, the developers carefully analyze and determine the important tasks of the team members for the project and future improvement in attaining its objective. Then the researcher find an architect to design a floor plan both interior and exterior of the propose Techno hub.

III. RESULTS AND DISCUSSION:

To fully realize this potential, it is important to examine how best to organize the provision and use of these services and what can be learned from the different models applied in the region and elsewhere, with the particular aim of promoting an environment conducive to fostering the growth of small and medium-sized enterprises (SMEs). This opportunity arises at a time of tremendous change in the commercial and technological environment [9]. (OECD (2019), Southeast Asia Going Digital: Connecting SMEs, OECD, Paris,). This study focused on the physical structure and ICT requirements of the propose technology hub and particularly it has no data set used. One of the ICT requirements was the location where the proposed technology hub was accessible to the community near form the national road, University, and market. The supply of furniture will be purchased to the elegant computer shop that will provide displaying products at the computer shop with charm. The internet service provider will be the Globe telecom INC. It is a provider of telecommunication services and the strongest internet bandwidth signal in the island. The company that operates mobile fixed line and broadband network. The software licenses for the operating system will be the Microsoft windows. The building techno hub will also be insured for the purpose of financial reimbursement or compensation to the owner of a structured and its contents in case there was a damage or theft and to the person other than the owner if that person is injured on the property. The researcher proposed a project such as first, Internet Café particularly in the Island of Romblon where the people experienced limited internet connection most especially the students. In addition, people in the area encountered problem in terms of communications services. Students suffered a lot when it comes to their online study since all requirement compliance in school should be submitted online. Both are affected because of this pandemic outbreak. This proposed architecture will improve the speed up of the internet connectivity to 10,000Mbps bandwidth. The bandwidth was

distributed in four areas in techno hub. The internet Café has 5,000 Mbps, Laboratory and research Center has 3,000 Mbps, printing Press has 1, 000 Mbps and Photo Studio has 1,000 Mbps that satisfy the clients' needs by experiencing fast internet using an antenna for long-wavelength signal and frequency and using satellite internet connection is the most high-speed access links coverage at any place. The study was compared to other methods through benchmarking with other innovation technology hub. The uniqueness of this study itself is the connectivity which is directly coming from the satellite. It is often the main channel of voice communication for rural areas. Printing Press that the students will not spend a lot of time, effort, and a big amount of money to travel and go to other provinces or regions just to print their school outputs, thesis books, and other printing services they might need. Photo Studio which is not available in the area so this is very useful especially in taking the picture for the School ID, Graduation Pictorial, and Souvenir picture, Year Books and other special occasions. Ensure that the client has input the design process. Accomplish project business goals and objectives within defined budget and time parameters. Enhances the impact on standard business operations within Sibuyan Island. The DIH will have four main components or spaces: Interaction space will be home to a Digital Science Shop as a communications platform, where users can look for researchers solving their problems and young researchers (bachelor, master and doctor studies) can look for topics for their thesis. It will also comprise components for interaction Wikis, dialogue etc. Learning space providing an environment and courses that permit training of partners, external stakeholders and early adopters. Experimentation space, where users will have the chance to test new analysis techniques and model simulations and visualization with real data from their own pilot regions. Developer space, with cloud hosting, shared components, tools, services, data and development environments for pilots wishing to run their own services [6]. (Karel Charvat, et al.2019).

A. Network Infrastructure of Propose Technology Hub IT Business Project
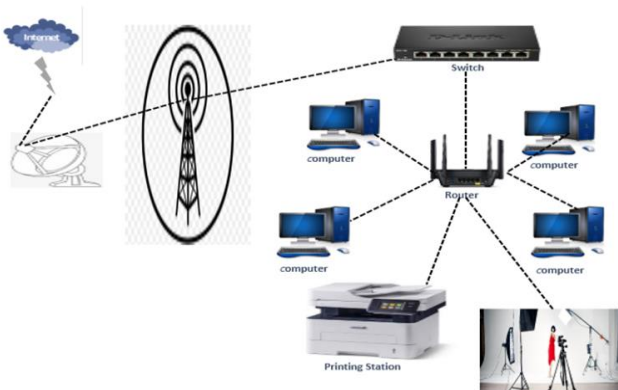

Fig. 1. Network infrastructure of a propose techno hub.

From Satellite the signal connect to the cell site going to the switch as central server of the Internet Café. The switch will connect to the router that will serve as a communication channel of computer network and printer. The researcher propose to use Hybrid Wireless Network Satellite System and point to point antenna with 5 Ghz or 2.4 Ghz as a radio transceiver. In addition, organizations are seeing the transformative potential of emerging technologies. High-speed 5G networks, a foundational technology, are ranked first for high-potential emerging technologies. 5G's high data rates will enable another class of technologies, such as virtual and augmented reality that will transform the ability of companies to use remote experts to guide in-field personnel. 5G will be instrumental in creating a mesh of connectivity for devices that are part of the internet of things (IoT) and autonomous vehicles [10]. (Dan Hushon, 2020).
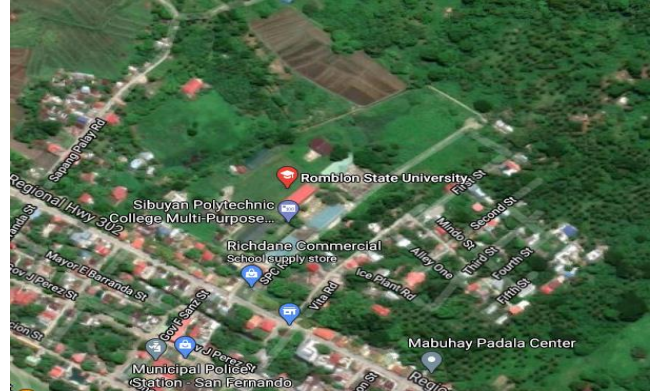
B. Site Description

Fig. 2. Project site.

The site of the project is situated inside the Romblon State University San Fernando Campus along Sibuyan SPC road. It was a relative flat terrain.

Fig. 3. Building architectural design concept.

C. Architectural Design Concept

The shape of site and building is inspired by pearl shell. Sibuyan Island, Romblon is a dubbed by some local and international scientist as "Galapagos of Asia" because it is one of the most unspoiled ecosystem in the Philippines and the world. It is also abundant in natural resources underneath the ocean. Pearl Shell is used as inspiration to the design of the structured because the island itself is a hidden gem.

Fig. 4. Site architectural design concept.

The concept of the site development plan is also inspired by a wifi symbol which means "improvements of technology in the Island".
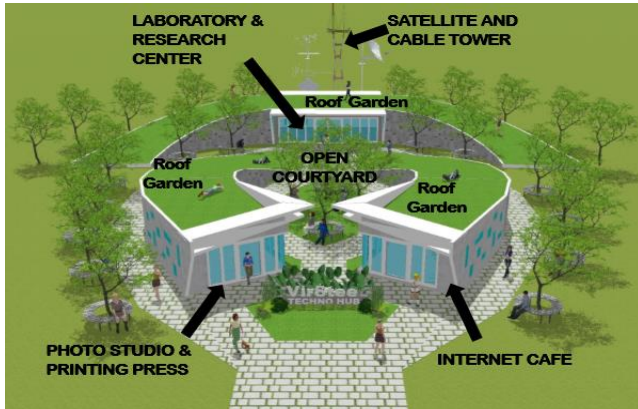
D. Space Planning

Fig. 5. Space planning.

The building A (right Side) is a 50.75 sq.m. Internet café building. It can accommodate 14 pax with waiting area and service counter with cashier. The new normal safety precautionary measure is incorporated through the use of acrylic dividers on each units and service counter. The building B (left Side) is 50.75 sq.m. Photo Studio and Printing Press Building. The printing area has a completed digital printing machine for paper works, T-shirts, Signage, Tarpaulin, Photocopying and AutoCAD Printing. It has waiting area and a counter. Also, beside the photo studio with dressing or make up room and comfort room.

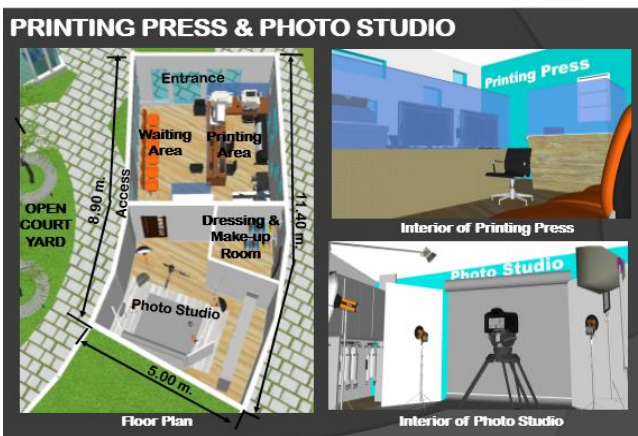*E. Interior Design (Inner view)*

Fig. 6. Internet café.

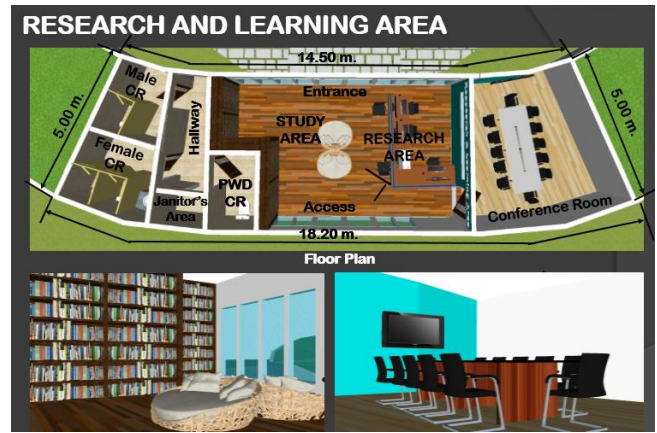Fig. 7. Printing press and photo studio.

Fig. 8. Research and learning area.

The research and Learning area has a study area, mini library and information technology conference room for meeting and public toilet for the customers.
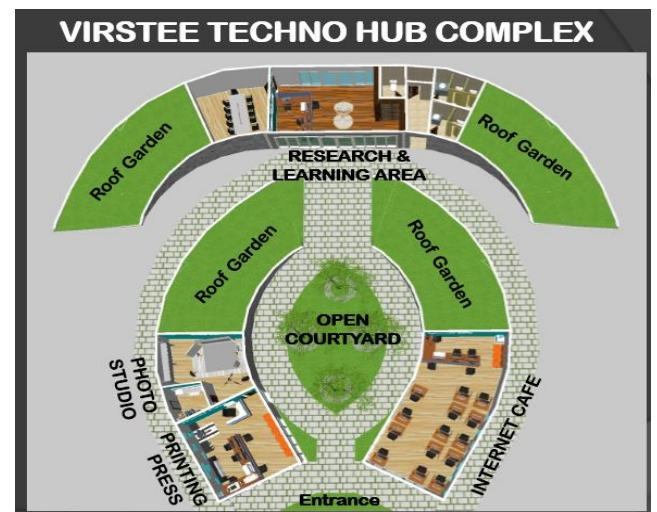

Fig. 9. Floor plan.

The Technology hub are composed of three areas such as Research and Learning Area, Photo Studio, Printing Press, and Internet Café. The site is composed of one story building with a roof garden on its structure that is accessible to user and to enjoy the outdoor environment. The building has an access to the open courtyard in the center surrounding with tress.
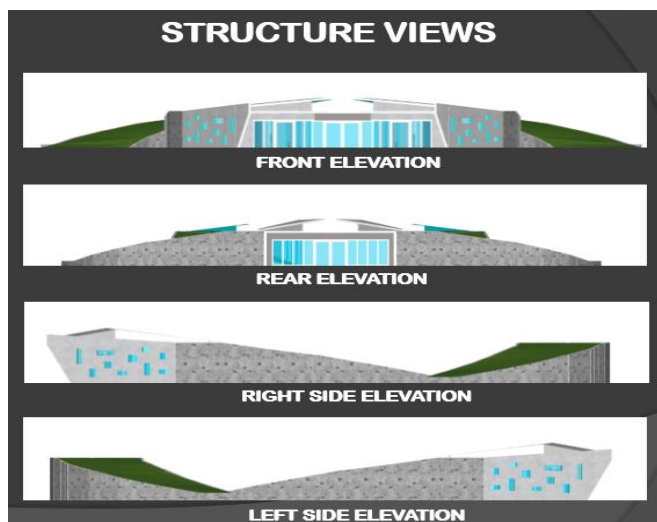

Fig. 10. Structural views.

This is the set of plan and details for how a building has a part and foundations, floors walls, columns and beams. This propose Techno hub was designed suited to the ambiance of the place. It is an environmental friendly and relaxing atmosphere that surely the students will enjoy while they are learning. The report is structured around a series of themes that emerged from the research, and that also reflect construction industry and societal opportunities and challenges. They are integral to ongoing digital transformation and are interrelated: Digital transformation. This means in architecture and where practices are on their 'journey', including the key benefits and challenges of digital transformation. Innovation, The technologies that are transforming architecture now and those that are likely to continue the evolution in the next few years. Productivity, How the adoption of digital ways of working, in improving the productivity and efficiency of projects and architectural practices. Collaboration, augmented and virtual reality technologies are improving the client experience, and aiding collaboration across projects and within organizations. Culture, The importance of having the right culture to enable digital transformation and some of those characteristics. Looking ahead Implications for the next wave of digital transformation, the technologies that will be important, the opportunities for architectural practices and the challenges to overcome.[1] (This report was produced by NBS Research on behalf of Microsoft and RIBA. 2018.)

F. Developoment Cost

ITEMS	ESTIMATED VALUE
Electric Bill for 12 Months	P 100,000.00
Transportation Expenses	P 100,000.00
Printing equipment	P 150,000.00
Internet and Load Expenditure	P 200,000.00
Building Constructions	P 18,000,000.00
Computer Units Sets(15 sets)	P 100,000.00
Materials and Equipment	P 300,000.00
Miscellaneous	P 100,000.00
TOTAL	P 19,150,000

Fig. 10. Development cost estimation of techno hub.

The building has estimated cost of P18, 000.000 pesos. Including the labor, materials, equipment, and other expenses.

IV. CONCLUSION

This project is considered as innovation that possibly can be implemented in the Island through the help of the Local Government Unit and Romblon State University- San Fernando Campus. This research examines the patterns of origin of the Tech Hubs, the non-digital complements that they provide to the digital technologies, what makes for success, and the impact of government and academic sector support on the role of Tech Hubs in the emerging digital ecosystem in some of Africa's largest cities.[5], [9] (Dr. Tim Kelly *et al*, 2016.) This propose project as a whole will be a greater impact for this new normal in the Sibuyan Island. This could help the economy to grow and give an opportunity to give new jobs especially for the IT professions. This is very responsive for the needs of the society in terms of socialization, communication, and education. Inclusion, efficiency, innovation are the main instruments spreading development gains from digital technologies, and the African tech hubs and incubator entities, across a wide range, aim to maximize all three in different ways. While digital technologies can make routine, transaction-intensive tasks dramatically cheaper, faster, and more convenient, most tasks also have a non-automatable part, whose execution requires human judgment, intuition, and discretion. In the case of Tech Hubs, the non-automatable part involves issues like choosing the right location, developing an appropriate governance structure, and being lucky enough to have inspirational leadership [5]. (Tim Kelly *et al*. 2016.). This propose IT project is timely and relevant. The researcher introduce and encourage the stakeholders to adopt the proposed IT project business and explore the technological innovations coming now and in the future also facilitate the digital journey.

APPENDIX

Appendixes, if needed, appear before the acknowledgment.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Nathanstee Q. Anayan was the one who constructed, in-charge for the editing and revised the paper. Virgil L. Penuela was the one who gathered and analyzed the data. He is the in-charge for checking and finalizing of the whole paper. All authors conducted the research as well as approved the final revision of the paper.

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