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# *Excellent Student Project System* (exSPRO) Application: As an Integrated Data Storage System Students' Quality Innovation Products

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***ABSTRACT:*** *Various efforts have been made to review online applications. However, online visual system applications featuring project work or student innovation products have yet to be extensively studied by researchers. Therefore, the work of student innovation projects is kept safe, physically, and conventionally. The effect is that quality innovation products produced by students are not systematically stored and disseminated. Promotion and distribution of student innovation products for commercialisation purposes is also not effectively publicised to the industry and community worldwide. If this condition persists, it will cause losses to institutions and countries due to the lack of maximising the source of creativity and quality of teaching and learning produced by students. Therefore, this study aims to assess the tendency to use Excellent Student Project System (exSPRO) online applications among users in polytechnics and community colleges in Malaysia. This study's methodology used questionnaires to lecturers involved in six polytechnics and randomly selected community colleges to represent each zone. Analytical theories on the entire study relating to human activity in the exSPRO application system are part of the research methods. The results of this study can prove the effectiveness of the impact and relevance of the application system. Overall, the findings will help JPPKK set the direction to uphold students' innovation products internationally for commercialisation purposes.*

***KEYWORDS:*** *Integrated data storage system, innovation products, quality, students*

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## I. INTRODUCTION

The current use of various technologies, particularly the online system applications used by an organisation, currently reflects that the organisation's progress aligns with the changing technological age. According to Rizal, Jusoff and Christon (2011), today's computer management system can replace the role of humans to extract information and help make decisions. Solving problems in certain situations can be solved quickly and has an impact on improving the organisation's performance and productivity (Ding, Levin, Stephan and Winkler, 2010). According to Gupta & Koo (2010), individuals with the capabilities and skills to use appropriate technologies can continuously communicate information and knowledge effectively to the community. In 2020, existing documents should be kept safely as a reference in the future. If the information is not recorded and documented, it is deemed unprecedented (Stier, 2014). Therefore, all essential data and information involving the organisation need to be appropriately and systematically stored for all users' convenience in the organisation.

Hence, a data record storage system, namely *Excellent Student Project System* exSPRO, was developed at the Department level. It is an organisation that coordinates all the innovation products of polytechnic students and community colleges throughout Malaysia. This exSPRO system was introduced as a record-keeping method for students' outstanding innovation projects containing the desired data and information. According to Lam, Wong, Cheng, Ho & Yuen (2011), one of the determining factors for implementing innovation in education is the level of willingness and acceptance of users towards information systems.

Thus, with the development of this exSPRO system, it can be applied at the polytechnic and community college levels to collect and track students' product innovation records more systematically. Therefore, the

platform is designed to store student's innovation products with high potential and impact for commercialisation. Besides, it is also easily accessible to the public (individuals/communities/industries) interested in commercialising the product. Lecturers and students can use it to reference their upcoming projects.

Based on the requirements of ISO Standard 9001:2008 Clause 8.2.1 – Customer Satisfaction is a measurement tool of high quality, namely the Management System Performance. Hence, as an organisation directly related to clients, especially students and lecturers in polytechnics and community colleges, a system for monitoring the record-keeping of students' outstanding innovation projects related to customer perception, for example, exSPRO system, was established. In line with this, a study on the implementation of the exSPRO system is carried out.

### 1.1 PROBLEM STATEMENT

Online data storage systems are a basic need for academic institutions such as polytechnics and community colleges. Over the years after institutions have been established, there has still been no online system that records and stores data on innovation products produced specifically by students. Failure to properly manage the student's brilliant innovation project record can negatively impact the organisation. It may also lead to the plagiarism problem where creative ideas of student innovation products can be imitated or stolen irresponsibly.

### 1.2 RESEARCH OBJECTIVE

The system must be developed systematically and orderly according to the regulations to ensure that all records and data are protected and accessible quickly when needed. Therefore, this study's objective is to assess the effectiveness of the implementation of the exSPRO system as a centralised and coordinated data system and be a systematic data storage hub. Studies on the implementation of exSPRO systems in improving quality excellence and testing the level of achievement of the system in polytechnics and community colleges are implemented with pre-testing.

## II. LITERATURE REVIEW

Some previous studies have proven that Technical and Vocational Education and Training (TVET) and technology are always linked. Various excellence has been achieved in TVET development as a result of several technologies adopted in the system. Hence, the close relationship between TVET and technology has made TVET education recognisable as an important medium for social equity, inclusion, and sustainable development.

### 2.1 TVET AS THE MAIN EDUCATION OF THE FUTURE

According to Dr. Maszlee (2019), the TVET field is seen as a large and uniform single entity to realize such aspirations. It involves a harmonised accreditation system with quality assurance. Therefore, it enables students' mobility between TVET institutions to work with innovation agencies to introduce new technologies that can be utilised by the industry. Innovation towards TVET's brilliance can develop creative and innovative potentials that can be continued to be commercialised (Suhairi Ismail, 2020). According to Lamsah and Chear (2017), innovations in education are often tied to students' learning outcomes and employability. Innovation is a method of finding ways to produce better products or services, either through modification or improvement. It results from the brainchild of creative and innovative ideas in terms of work that can improve quality and productivity [5]. With this, the production of ideas can transform them into new forms of products, services, systems and operating methods. In other words, it is a new idea to produce specific processes such as invention, production and development. Innovation is also a process that transforms ideas into practices or something practical. It is also a catalyst to transform an idea into a potential and high impact invention. In the context of commercialisation, innovation is estimated as *'the process by which an idea or invention is translated into a good service or which people will pay, or that something results from this process'*. Ideas and products are creative and then converted to commercial value and marketability among the community, society, and community users.

### 2.2 INTEGRATED DATA STORAGE SYSTEM

'System' is a term in the Greek language, "system," which means collecting the most corresponding parts or elements regularly to achieve a common purpose. Therefore, an integrated data storage system is a well-structured data system in electronic form. A collection of relevant data shared in various categories of users aim to meet the needs and requirements of information according to organisational needs. According to John Mc Manama, the system is a conceptual structure composed of functions that work with each other as an organic unity to achieve the desired results effectively and efficiently. Data is also a collection of raw facts about an object, event, entity, or person consisting of words, numbers, or images. Data can be a meaningful or meaningless fact until the fact is processed. According to Noraini Idris (2010), all research involves data collection. Data refers to information obtained in connection with the study. When the data is integrated, it is located in one database. Therefore, it can work in an integrated and composed manner to reduce overwhelming data with this integrated data storage system.

## III. METHODOLOGY

This study aims to review online applications to improve the delivery system and coordination of teaching and learning (P&P) in institutions through the *Excellent Student Project* (exSPRO) system for record-keeping of outstanding student innovation projects. The design of the study used is descriptive. Accumulated data is quantitative to help get a large amount of data. This study is carried out on a percentage, frequency, and descriptive analysis of consumer understanding.

A total of 76 respondents consisting of 9 Polytechnics and 6 Community Colleges were gathered. 14 respondents (18.42%) is the Head of Research, Innovation and Commercialisation Unit, 6 respondents (9.7%) is the Head of Programme. In comparison, 21 respondents (33.9%) is a Project Coordinator, and 35 respondents (56.5%) is a Student Supervisor for the December 2019 session that has responded.

Research design is essential for a study. It can be used as a guide to ensure that the study's objectives are achieved, which will answer the study's questions. The study aims to view users' effectiveness in student data storage systems as an integrated hub that can systematically and securely access and store students' projects. This study was conducted to examine whether online system applications can meet the requirements to improve the delivery system and facilitate teaching and learning (P&P) processes, especially among lecturers and students in institutions.

The pre-testing was conducted by running tests to identify whether the system application could improve access and input achievement in some Polytechnics and Community Colleges. The respondents were selected randomly by zone. According to Pollarra (2011), applications are developed to allow users access to various information and content. Also, it can help users perform tasks more efficiently. This exSPRO system is still in the process of development and improvement.

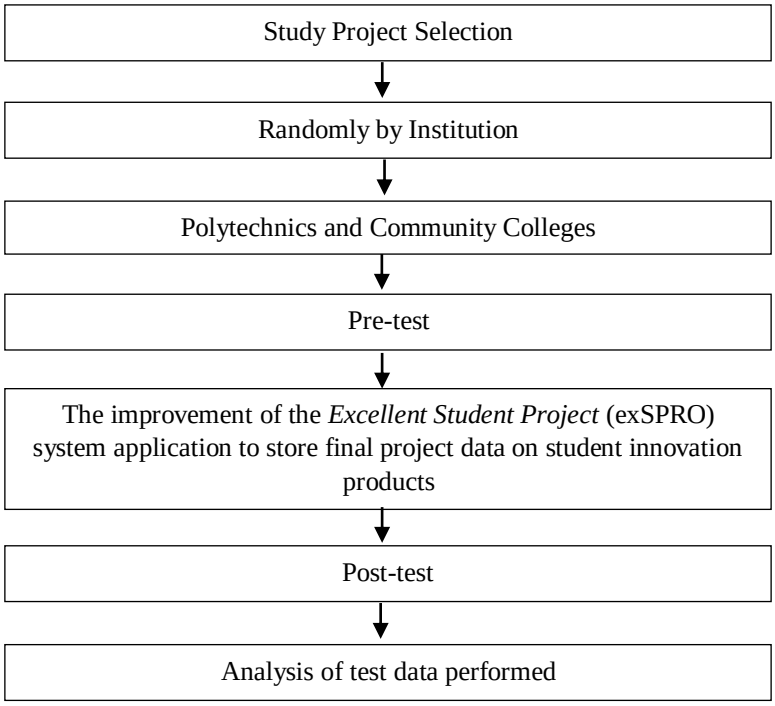


**Figure 1**: Study of exSPRO system application used by students' project supervisors.

The instrument method chosen in this study is a questionnaire. The questionnaire is divided into two parts. The first part is the respondents' background, such as their gender, age, position, program and department. The second part is related to the access of the system developed, and it contains ten items that measure the effectiveness of the system's development. Data measurements for part two are a Likert scale to measure respondents' opinions and perceptions about the exSPRO system developed. Respondents were given 5 scale options of answers, for instance, 1=Very Unsatisfactory, 2=Unsatisfactory, 3=Simple, 4= Good, and 5= Very Good.

The data were analysed using *Statistical Program for Social Science* (SPSS), a software package used for interactive, or batched, statistical analysis. Then, for the respondents' studies, a scale presented in table 1 was used to analyse the data obtained.

**Table 1:** Interpretation Table

| Min Score | Interpretation |
|---|---|
| 1.00 – 2.00 | Low |
| 2.01 – 3.00 | Medium Low |
| 3.01 – 4.00 | Medium High |
| 4.01 – 5.00 | High |

## IV. ANALYSIS AND FINDINGS

This section will discuss the findings from the data analysed using SPSS version 2.0. All results obtained are presented in the form of graphs and pie charts. The findings show that this study had met the objectives of the study and answered the problems and questions raised in the study.

### 4.1 USAGE RATE ANALYSIS

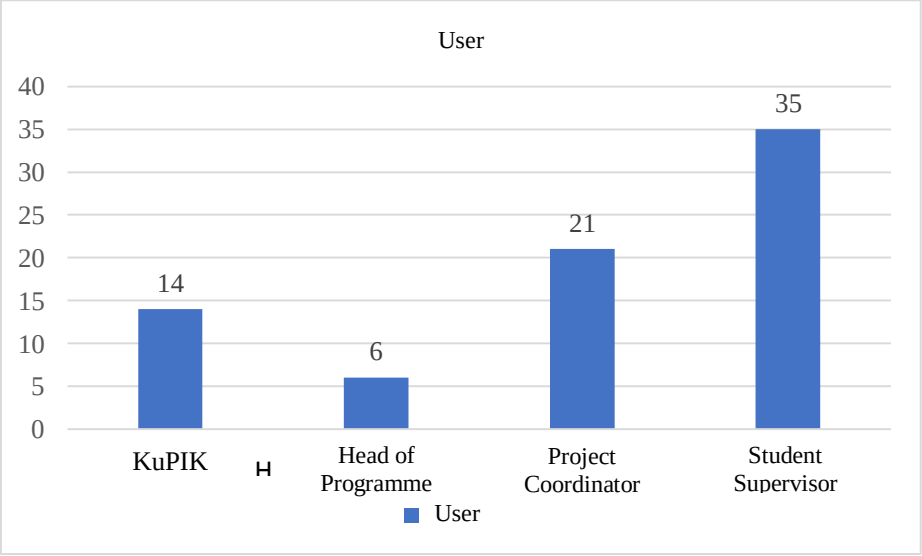


**Figure 2:** User rate achievement level

The study involved 76 respondents, as shown in Figure 2, comprising 9 Polytechnics and 6 Community Colleges. 14 respondents (18.42%) are the Head of Research, Innovation and Commercialisation Unit (KuPIK), 6 respondents (9.7%) are the Head of Programme. In comparison, 21 respondents (33.9%) are Project Coordinators, and 35 respondents (56.5%) are the Student Supervisors for the December 2019 session. All in all, the Student Supervisors and Project Coordinators' rate of achievement levels play the most critical roles in the operation of the *Excellent Student Project* (exSPRO) system for the final project. However, the Head of Programme's role is also essential to ensure that the student project data stored does not overlap with other students' projects to avoid the project owners' confusion.

### 4.3 ANALYSIS OF INFRASTRUCTURE ACHIEVEMENT RATE

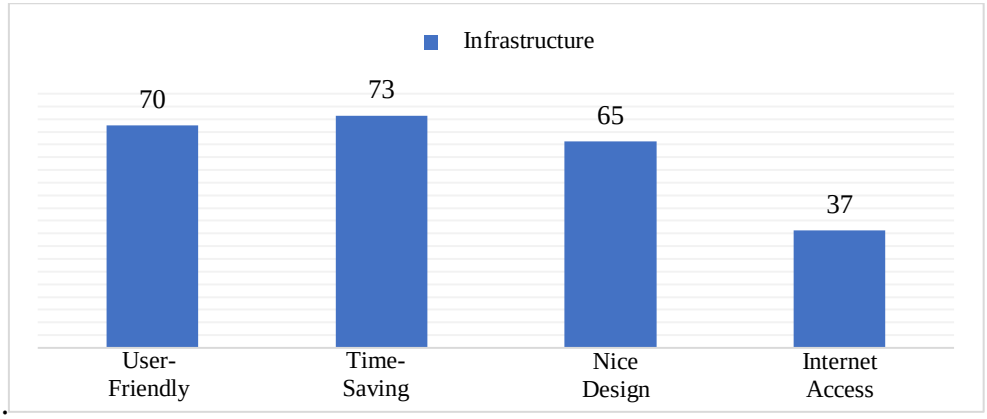


**Figure 3:** Infrastructure achievement level

In Figure 3, it can be concluded that the overall infrastructure achievement is at a satisfactory level. Internet access is a problem that is often an issue to consumers. However, it can be overcome by ensuring faster and conducive internet access is provided. However, it is essential to note that some problems have arisen regarding the unstable internet access problem at the beginning of experimentation. Based on the data obtained from this section, the percentage of Time-Saving and User-Friendly is among the highest, which are 30% and 29% respectively. It stated that the exSPRO operating system's interface design is good and help save users' time.

## V. CONCLUSION

The *Excellent Student Project* (exSPRO) system is a record-keeping of students' outstanding innovation projects. A comprehensive review of the system is the fact that it should be driven by related parties, including polytechnic's management and community colleges, to have a more effective overall impact. The enhancement of the new technological culture, the exSPRO platform is a system that will be applied as an integrated data storage system in the collection. Besides, it is also used to manage and monitor the data so that students' innovation products can be organised better and more systematically. This data hub can also be used as a source of reference and innovation repository to lecturers and students globally. With the availability of this *Excellent Student Project (*exSPRO) system, it can help facilitate accessing the information to be faster and more effective. This information can be shared or channeled directly to external agencies, industries that have gained interest, and communities. To have commercial demand for innovation products in line with information technology's globalisation, data management in polytechnics and community colleges should be automated to upgrade and improve the existing information management. This project is a digital transformation of innovative data management.

*Excellent Student Project* (exSPRO) Application: The Integrated Data Storage System of Quality Student Innovation Products can provide solutions to institutions' management problems. Also, at the same time, implementing a separate data management system. Also, institutions can regulate students' innovation products and facilitate the information access process to be faster and more effective.

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