

“Plant Performance Operations and Financial Tracking (PROFIT)” Mobile Application as Integrative Strategic Information Systems in Pertamina

Daniswara Krisna Prabatha^{1,2,*} and Seger Handoyo¹

¹Department of Human Resource Development, Graduate School, Airlangga University, Jl. Airlangga 4-6, Dharmawangsa, Surabaya, 60286, Indonesia

²Process Engineering Section, PT. Pertamina (Persero) Refinery Unit III Plaju, Jl. Beringin No. 1, Komperta, Plaju, Palembang, 30268, Indonesia

*Corresponding author: daniswara.krisna@pertamina.com

Submitted: 06-06-2022; Accepted: 27-06-2022

Abstract

Plant Performance Operations and Financial Tracking (PROFIT) mobile application is an effort by Pertamina, an Indonesian State-owned Enterprise that runs an integrated core business at oil, gas, and renewable energy, to implement an integrative strategic information system (SIS). PROFIT aims to provide information among employees, to monitor the performances of the refinery, facilitate communication and coordination of work activities among employees, and support the budgeting process at several projects initiated. This study examines the effect of the PROFIT mobile application as an integrated information system on employee performance. The results show that PROFIT Apps as SIS, is a positive and significant variable in the performance of the Process Engineering of Pertamina Refinery Unit III Plaju’s Employees. The samples used in the study were Process Engineering of Pertamina Refinery Unit III Plaju’s Employees. Data collection methods use questionnaires and data processing techniques used through multiple linear regression analysis. This research could contribute ideas and scientific study materials for PT. Pertamina (Persero) Refinery Unit III and other company management in setting policies related to development of SIS as integrative information systems as an effort to influence corporate strategy and performance positively.

Keywords: corporate performance; mobile application; refinery performance; strategic information systems

INTRODUCTION

The rapid industrial development causes global competition at an extraordinary speed (Chin et al., 2019). One of the changes in the industrial revolution 4.0 is the

change in information systems, with the development of integrative information systems strategies. SIS as an application is using an Information System (IS) to support the process and content of the company's strategy (Arias-Pérez et al., 2020; Gomez-

Trujillo & Gonzalez-Perez, 2021). Research on SIS is urgent because it could affect employee performance in companies that can apply it successfully.

Pertamina as an Indonesian Owned Enterprise of Oil and Gas, have refineries that process crude oil into petroleum products that can be directly used by vehicles as well as other products that become raw materials for the petrochemical industry (Septiana & Sukarno, 2020). The oil refinery is a very complex industrial facility with various types of process equipment and supporting facilities so that an information system strategy is needed at the Pertamina refinery. In this expanding volatility era, the implementation of information system strategy by Pertamina is urgently needed if the company want to survive. Petroleum companies in Iran have applied WCCA-based knowledge management to develop strategically oriented projects and validate in Iran oil Industry. The use of WCCA-based KM has resulted in 17 strategically oriented projects (Ghasemi et al., 2021).

Industrial security is achieved when adequate measures and procedures are put in place to gain access to, handle, or generate information during the performance of work within the industry. Several strategies have been proposed to improve the quality of employee work by using different techniques (Chevalier et al., 2020; Ismagilova et al., 2019). Several studies have examined how the availability of application technology with strategic information systems can affect industrial organizations in service

providers and adopting technology (Kapoor et al., 2018; Nisar et al., 2019).

The strategic impact of information systems on industry 4.0 and its possible application in other fields has been studied in depth (Lin et al., 2018). In recent years, research has also been carried out on applications with strategic information systems in the manufacturing industry (de Camargo Fiorini & Jabbour, 2017; Hadid & Al-Sayed, 2021; Lynn & Emanuel, 2021). The mobile applications of PROFIT (Plant Performance Operations and Financial Tracking) are an effort from Pertamina to implement a strategic information system that aims to provide information on how project plans are realized, facilitate communication and coordination of work activities among work personnel, support the budgeting process and match job requirements with personnel qualifications. The PROFIT Apps could reach all of Pertamina's employees in several levels from operators to top director. Definitely, PROFIT Apps is a kind of Strategic Information System (SIS), that are used at every level of the organization that change operational objectives, service products and environmental relationships to help organizations gain competitive advantage.

Strategic information system provides a connection between demands of organization and latest information technology. This tactic helps an organization to get hold of the market by utilizing Information tech to meet its challenging requirements to the continuous variation in the corporate environment (He et al., 2021;

Tallon et al., 2019). With PROFIT Apps, it is intended that Pertamina's refineries seek to strengthen competitive advantage in the market through IT-enabled business processes. But this effort did not run smoothly as expected, since there were also a lot of challenges regarding the technical aspects of aligning business strategies with IT-enabled business processes, inputting the data, and teaching the operator to use the Apps independently to make the process autonomous. This challenge has been completed by bridging all of the sections at Pertamina to unify the same vision: to build Pertamina together. That would be the operation that is need to be executed, with the help of the role of Process Engineering Section. Process Engineering is one of the core sections at Pertamina refinery, since this section has responsibility to compile, direct, monitor, control, provide advice and evaluate technology development study activities related to the optimization of processing processes in the Refinery Unit area. In addition, the Process Engineering Section also monitors, controls, and evaluates refinery operational activities which include preparation for refinery operations (including pre-Startup safety review), normal operations (including trouble shooting, process control system), and also plant stop (turn around) activities), including process integrity of units at the refinery.

PROFIT Apps is closely related to Pertamina Refinery Unit III Plaju. The success of Pertamina Refinery Unit III Plaju as the initiator in using the PROFIT Apps could not be separated from the role of the Process

Engineering Section of RU III Plaju, that initiates and develops PROFIT Apps for the first time. For initial research, it is necessary to conduct the research on the performance of process engineering employees at Refinery Unit III Plaju as early users of PROFIT Apps.

The strategic development of information systems in the last few decades has led to the development of countless applications in various fields. Today, increasingly better solutions are available to improve employee performance and industrial enterprise development. Applications with this information system strategy aim to improve employee performance by reducing the possibility of illness, injury, absence or death and early detection of risks in the work environment (Almaatouq et al., 2020; Campero-Jurado et al., 2020).

PROFIT Apps aims to monitor operating conditions and unit performance. From the actual phenomena in several Pertamina employees, the existence of this application brings many significant effects. First effect could be seen from shifting many manual and paper works done by the employees, to digital work. Before PROFIT Apps, there are no centralized SIS with many purposes to handle many data needed on meetings. With this digitalization, it makes an efficient time to work, since the data needed in meeting is already saved in the Apps, and could be opened everywhere and every time, and updated real time.

Previously without PROFIT Apps, a long time is needed for processing required steps to complete an operation, since it requires manual

coordination and unstructured monitoring. PROFIT Apps should make finalizing operation faster, since all processes are recorded in the application, completed with steps, time, and processes that are already running. This application intention is to bring an effective SIS in order to help organizations successfully overcome the strategic planning process. Successful strategic planning implies the company's ability to effectively promote employees' cooperative work in thinking, analyzing and developing strategies supported by IS. Structuring steps of work with PROFIT Apps is in line with the intention of ERP (Enterprise Resource Planning). ERP system is a concept of planning and managing company resources in the form of integrated program application packages and multi-modules. The module is designed to serve and support various function, in order to make the organizations run effectively and efficiently. ERP works with a variety of technologies, including the Internet of Things (IoT). IoT uses unique Internet protocols to identify, control, and transfer data to individuals and databases. Data is collected via IoT, stored in the cloud, and extracted and managed via ERP (Tavana et al., 2020).

PROFIT Apps could integrate refineries information, such as strategic project planning, key performance indicators of general manager, plant operation performances including capacity and readiness, critical operating condition, crude oil and product quality, product and crude oil balance, chemical and catalyst stock, and start-up unit.

PROFIT Apps also contents financial tracking, including net income and EBITDA (earnings before interest, taxes, depreciation, and amortization) and finance dashboard. Technology changes and innovations that arise in the business environment affect the short-term performance and long-term sustainability of the company. Strategic information systems can have profound social implications as they change inter- and intra-organizational relationships, lead to unemployment among the low-skilled workforce, and increase data security and privacy concerns (Ghobakhloo & Fathi, 2020). From those gap, this research objective is to find the effect of PROFIT Apps with all of its benefits on Pertamina Refinery employee performance represented by process engineering section. This study needs to be done, since Pertamina's big main objective to make the PROFIT Apps is to survive on volatile, uncertain, complex, and ambiguous environment.

METHOD

Efficiency and productivity are important for an organization to survive 4.0 industrial revolution. This research objective is to find the effect of PROFIT Apps with all of its benefits on Pertamina Refinery employee performance represented by process engineering section. This study needs to be finished, since Pertamina's big main objective to make the PROFIT Apps is to survive on volatile, uncertain, complex, and ambiguous environment. This GAP need to be studied, since Pertamina is still on their way to maximizing and

upgrading the PROFIT Apps as a Super App, that could handle, not only Refineries, but also other sites such as upstream oil drilling field, research and technology center, and also main office. There still will be a lot of research, which sacrifice time and money to overcome all of those intentions. Then Pertamina need to be sure that all of the sacrifice could led to other benefits moreover could open another glory, instead of being buried by past glories. From those complications and concerns, this study used research model as follows:

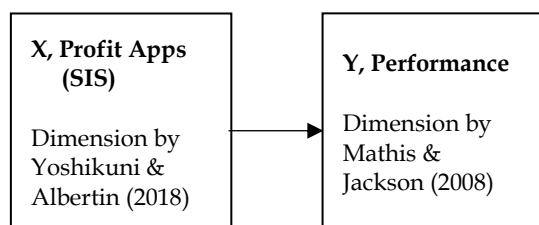


Image 1. Research model

From the research model as stated at Image 1., the hypothesis that PROFIT Apps as SIS have a positive effect on the process engineering section's employees performance is taken (Yoshikuni & Albertin, 2018; Mathis & Jacson 2008). The population in this study is all employees of Process Engineer PT. Pertamina (Persero) Refinery Unit III Plaju as many as 19 employees. Data collection methods use questionnaires and data processing techniques used through multiple linear regression analysis. The characteristic of the respondent consisted of 10,5% women and 89,5% men, with the age of respondents, ranging from 20 - 30 years old (68,4%) and 30-35 years old (31,6%). The data collection takes one week of observing, collecting, and analyzing. The operational variables represented in

the questionnaire include 5 (five) items presented in the form of Likert-type scales for SIS promotes capacity and flexibility to create competitive strategies in response to environmental changes. SIS significantly and positively predicts firms' use of prospector strategies, reducing the need to sacrifice efficiency for innovation (Yoshikuni & Albertin, 2018) and 11 (eleven) items for performance (Mathis & Jackson 2008).

RESULT AND DISCUSSION

Based on the results of multiple linear regression analysis, the following equation is obtained:

$$Y = 1,805 + 0,511X + E$$

The intercept value of the equation shows a value of 1.805 (Table 1). This value represents that the process engineering section's employees' performance variable will be worth by 1.805, if there is no value associated with PROFIT Apps as SIS. The value of the performance variable shows a positive value of 0.511. This shows that for every 1% increase in the PROFIT Apps ratio as a SIS, the performance increases by 0.511%. Previous research has shown that integration is a complex construction that can be classified into technical, system, organizational and strategic aspects; each considered important when adopting SIS. Based on Wainwright & Waring (2004) that most of the failures in the implementation of SIS are due to the emphasis on reducing complex organizational factors. The successful implementation of SIS must have a balance between technical, strategic and organizational

analysis (Al-Emran et al., 2018). Based on Aldholay et al., (2018) that the implementation of SIS can increase performance by 61%.

PROFIT Apps as a form of SIS involve various tools and techniques to handle processing large data sets. SIS can add value and support or drive decisions for businesses, these tools and techniques statistically and quantitatively analyze large sets of data sources (Delen & Zolbanin, 2018).

As many as 89% of companies believe that in addition to having an impact on employee performance, SIS also has an impact on company performance (Aydiner et al., 2019). SIS has the potential to change the way companies compete through better understanding, processing and exploiting large amounts of data coming from different internal and external sources and processes (Ferraris et al., 2019).

Table 1. Summary of regression analysis results

Variable	Regression Coefficient	R square	t count	F count	Sign.
X, Profit App (SIS)	0.534	0.261	2.451	6.006	0.025

Then, the analysis of determination was also carried out to find out how much PROFIT Apps as SIS variable could influence the process engineering section's employees' performance. The value of R square obtained is 0.261. It means that 26.1% of the process engineering section's employees' performance could be defined by the triumph of PROFIT Apps usage as SIS. Based on the results of research Centobelli et al., (2019) that 78% of the use of SIS has a positive effect on employee performance which is supported by increased knowledge management. However, various researchers say that knowledge management contributes to the efficient use of SIS (Migdadi et al., 2016).

Then the t_{test} analysis was also carried out which was a representation of the significance of the individual parameter tests. The value of the t_{test} results for the PROFIT Apps variable as SIS (X) on the process engineering section's employees' performance (Y)

shows a value of 0.025 (Table 1). So that the significance value is smaller than the significance value smaller than the probability value of 0.05 ($0.025 < 0.05$) and t_{count} shows a value of 2.451, meaning $t_{count} > t_{table}$ ($2.451 > 1.734$). So, it can be said that PROFIT Apps as SIS have a positive effect on the process engineering section's employees' performance. The results of this study are consistent with Yunis et al., (2018) that adopting SIS has a positive relationship with organizational performance in the Lebanese market, taking into account the impact of corporate entrepreneurship on this relationship. Information technology-based innovations and applications have become the main drivers of improving organizational performance, economic growth, and social change (Liu & Lee, 2018).

CONCLUSION

This study delivers that PROFIT Apps as SIS is a positive and

significant variable on the performance of the process engineering section employees' performance. This research could contribute ideas and scientific study materials for PT. Pertamina (Persero) Refinery Unit III and other company management in setting policies related to development of SIS as integrative information systems as an effort to influence corporate strategy and performance positively.

The limitation of this study is conducting initial research with limited respondents from the Process Engineering section. It is also caused by the use of PROFIT apps, which currently is still limited to the Process Engineering section its surroundings. Future research needs to carry out this research on a larger scale, for all layers of Pertamina when PROFIT apps has been applied at Pertamina on a large scale.

Also, as a scientific contribution for further researchers in the field of corporate human resources development, specifically regarding the development of SIS. Further researchers could also overcome research that studied the effect of SIS in employees' satisfaction, happiness, and creativity.

ACKNOWLEDGEMENT

I would like to express my very great appreciation to Airlangga University, for illumining me during the planning and development of this research work. The lecturers' willingness to give their time so generously has been very much appreciated.

Thank you for PT. Pertamina (Persero) refinery Unit III, especially for Process Engineering Section, for enabling me to observe and analyze their daily operations, especially in PROFIT Apps usage.

REFERENCES

- Al-Emran, M., Mezhuyev, V., Kamaludin, A., & Shaalan, K. (2018). The impact of knowledge management processes on information systems: A systematic review. *International Journal of Information Management*, 43(July), 173–187. <https://doi.org/10.1016/j.ijinfo.mgt.2018.08.001>
- Aldholay, A. H., Isaac, O., Abdullah, Z., & Ramayah, T. (2018). The role of transformational leadership as a mediating variable in DeLone and McLean information system success model: The context of online learning usage in Yemen. *Telematics and Informatics*, 35(5), 1421–1437. <https://doi.org/10.1016/j.tele.2018.03.012>
- Almaatouq, A., Noriega-Campero, A., Alotaibi, A., Krafft, P. M., Moussaid, M., & Pentland, A. (2020). Adaptive social networks promote the wisdom of crowds. *Proceedings of the National Academy of Sciences of the United States of America*, 117(21). <https://doi.org/10.1073/pnas.1917687117>
- Arias-Pérez, J., Velez-Ocampo, J., & Cepeda-Cardona, J. (2020). Strategic orientation toward digitalization to improve

- innovation capability: Why knowledge acquisition and exploitation through external embeddedness matter. *Journal of Knowledge Management*, 25(5), 1319-1335.
<https://doi.org/10.1108/JKM-03-2020-0231>
- Aydiner, A. S., Tatoglu, E., Bayraktar, E., Zaim, S., & Delen, D. (2019). Business analytics and firm performance: The mediating role of business process performance. *Journal of Business Research*, 96, 228-237.
<https://doi.org/10.1016/j.jbusres.2018.11.028>
- Campero-Jurado, I., Márquez-Sánchez, S., Quintanar-Gómez, J., Rodríguez, S., & Corchado, J. M. (2020). Smart helmet 5.0 for industrial internet of things using artificial intelligence. *Sensors (Switzerland)*, 20(21), 1-27.
<https://doi.org/10.3390/s20216241>
- Centobelli, P., Cerchione, R., & Esposito, E. (2019). Efficiency and effectiveness of knowledge management systems in SMEs. *Production Planning and Control*, 30(9), 779-791.
<https://doi.org/10.1080/09537287.2019.1582818>
- Chevalier, M., et al.(2020). Pollen-based climate reconstruction techniques for late quaternary studies. *Earth-Science Reviews*, 210, 103384.
<https://doi.org/10.1016/j.earsci.rev.2020.103384>
- Chin, T., Jiao, H., & Jawahar, I. M. (2019). Sustainable career and innovation during manufacturing transformation. *Career Development International*, 24(5), 397-403.
<https://doi.org/10.1108/CDI-09-2019-331>
- de Camargo Fiorini, P., & Jabbour, C. J. C. (2017). Information systems and sustainable supply chain management towards a more sustainable society: Where we are and where we are going. *International Journal of Information Management*, 37(4), 241-249.
<https://doi.org/10.1016/j.ijinfomgt.2016.12.004>
- Delen, D., & Zolbanin, H. M. (2018). The analytics paradigm in business research. *Journal of Business Research*, 90, 186-195.
<https://doi.org/10.1016/j.jbusres.2018.05.013>
- Ferraris, A., Mazzoleni, A., Devalle, A., & Couturier, J. (2019). Big data analytics capabilities and knowledge management: Impact on firm performance. *Management Decision*, 57(8), 1923-1936.
<https://doi.org/10.1108/MD-07-2018-0825>
- Ghasemi, B., Khalijian, S., Daim, T. U., & Mohammadipirlar, E. (2021). Knowledge management performance measurement based on world-class competitive advantages to develop strategic-oriented projects: Case of Iranian oil industry. *Technology in Society*, 67, 101691.
<https://doi.org/10.1016/j.techsoc.2021.101691>
- Ghobakhloo, M., & Fathi, M. (2020). Corporate survival in Industry 4.0 era: The enabling role of lean-digitized manufacturing. *Journal of Manufacturing Technology*

- Management, 31(1), 1-30.
<https://doi.org/10.1108/JMTM-11-2018-0417>
- Gomez-Trujillo, A. M., & Gonzalez-Perez, M. A. (2021). Digital transformation as a strategy to reach sustainability. *Smart and Sustainable Built Environment*.
<https://doi.org/10.1108/SASBE-01-2021-0011>
- Hadid, W., & Al-Sayed, M. (2021). Management accountants and strategic management accounting: The role of organizational culture and information systems. *Management Accounting Research*, 50, 100725.
<https://doi.org/10.1016/j.mar.2020.100725>
- He, W., Zhang, Z., & Li, W. (2021). Information technology solutions, challenges, and suggestions for tackling the COVID-19 pandemic. *International Journal of Information Management*, 57.
<https://doi.org/10.1016/j.ijinfo.mgt.2020.102287>
- Ismagilova, E., Hughes, L., Dwivedi, Y. K., & Raman, K. R. (2019). Smart cities: Advances in research, an information systems perspective. *International Journal of Information Management*, 47, 88-100.
<https://doi.org/10.1016/j.ijinfo.mgt.2019.01.004>
- Kapoor, K. K., Tamilmani, K., Rana, N. P., Patil, P., Dwivedi, Y. K., & Nerur, S. (2018). Advances in social media research: Past, present and future. *Information Systems Frontiers*, 20(3), 531-558.
<https://doi.org/10.1007/s10796-017-9810-y>
- Lin, D., Lee, C. K. M., Lau, H., & Yang, Y. (2018). Strategic response to Industry 4.0: An empirical investigation on the Chinese automotive industry. *Industrial Management and Data Systems*, 118(3), 589-605.
<https://doi.org/10.1108/IMDS-09-2017-0403>
- Liu, C. L., & Lee, M. Y. (2018). Integration, supply chain resilience, and service performance in third-party logistics providers. *International Journal of Logistics Management*, 29(1), 5-21.
<https://doi.org/10.1108/IJLM-11-2016-0283>
- Lynn, N. D., & Emanuel, A. W. R. (2021). Strategic information systems planning for higher education in Uganda. *IOP Conference Series: Materials Science and Engineering*, 1096(1), 012015.
<https://doi.org/10.1088/1757-899x/1096/1/012015>
- Mathis, R. L., & Jackson, J. H. (2008). *Human resource management*. Thomson/South-western.
- Migdadi, M. M., Abu Zaid, M. K. S., Al-Hujran, O. S., & Aloudat, A. M. (2016). An empirical assessment of the antecedents of electronic-business implementation and the resulting organizational performance. *Internet Research*, 26(3), 661-688.
<https://doi.org/10.1108/IntR-08-2014-0203>
- Nisar, T. M., Prabhakar, G., & Strakova, L. (2019). Social media information benefits, knowledge

- management and smart organizations. *Journal of Business Research*, 94, 264–272. <https://doi.org/10.1016/j.jbusres.2018.05.005>
- Septiana, N. F., & Sukarno, I. (2020). Safety stock analysis of ship fuel in shipping company (Case study: White oil ship PT. Pertamina (Persero)). *IOP Conference Series: Materials Science and Engineering*, 847(1). <https://doi.org/10.1088/1757-899X/847/1/012021>
- Tallon, P. P., Queiroz, M., Coltman, T., & Sharma, R. (2019). Information technology and the search for organizational agility: A systematic review with future research possibilities. *Journal of Strategic Information Systems*, 28(2), 218–237. <https://doi.org/10.1016/j.jsis.2018.12.002>
- Tavana, M., Hajipour, V., & Oveisi, S. (2020). IoT-based enterprise resource planning: Challenges, open issues, applications, architecture, and future research directions. *Internet of Things (Netherlands)*, 11. <https://doi.org/10.1016/j.iot.2020.100262>
- Wainwright, D., & Waring, T. (2004). Three domains for implementing integrated information systems: Redressing the balance between technology, strategic and organisational analysis. *International Journal of Information Management*, 24(4), 329–346. <https://doi.org/10.1016/j.ijinfo.mgt.2004.04.001>
- Yoshikuni, A. C., & Albertin, A. L. (2018). Effects of strategic information systems on competitive strategy and performance. *International Journal of Productivity and Performance Management*, 67(9), 2018–2045. <https://doi.org/10.1108/IJPPM-07-2017-0166>
- Yunis, M., Tarhini, A., & Kassar, A. (2018). The role of ICT and innovation in enhancing organizational performance: The catalysing effect of corporate entrepreneurship. *Journal of Business Research*, 88, 344–356. <https://doi.org/10.1016/j.jbusres.2017.12.030>