Electronic Integrated Computer Algorithm Journal
Vol. 1, No. 2, April 2024, pp 63~68

ISSN: 3031-0350, DOI: 10.62123/enigma.v1i2.19

Evaluating IT Delivery Value in the Faculty of Industrial Engineering at Telkom University Using the COBIT 2019 Framework, Domain APO04, for Mapping LAM INFOKOM Standards

Muhammad Haikal Fasya[1*], Muharman Lubis[1], Lukman Abdurrahman[1], Matias Garcia-Constantino[2], Sahidan Abdulmana[3], Rafian Ramadhani[1]

[1] *Telkom University*, Bandung, Indonesia
[2] *School of Computing, Faculty of Computing, Engineering and the Build Environment*, Belfast, United Kingdom
[3] *Department of Data Science and Analytics, Faculty of Science and Technology, Fatoni University*, Thailand

DOI :10.62123/enigma.v1i2.19

Received : March 29, 2024
Revised : April 06, 2024
Accepted : April 11, 2024

Keywords:
IT Delivery Value, LAM-INFOKOM, COBIT 2019, Domain APO04

ABSTRACT

In the contemporary landscape, technology holds pivotal significance across diverse domains, including academia and industry. The Faculty of Industrial Engineering at Telkom University faces challenges in optimizing the value derived from its IT investments to meet evolving market demands. To address this, IT governance methodologies are essential, ensuring effective and secure IT utilization aligned with strategic objectives. This study investigates and evaluates the IT delivery value process at the Faculty of Industrial Engineering, Telkom University, using the COBIT 2019 Domain APO04 framework and LAM INFOKOM standards. Data collection involved primary interviews and secondary document analysis. The analysis revealed gaps in assessing emerging technologies and recommending further initiatives. Recommendations span people, process, and technology aspects, aiming to enhance technology evaluation procedures and documentation. This study provides insights into effectively leveraging IT to achieve the Faculty's objectives and enhance decision-making quality.
.

1. INTRODUCTION

In the modern era, technology has become an indispensable aspect across various facets of life [1]. From everyday activities to the complex systems of companies, technology plays a critical role in driving processes. The increasingly complex market demands, evolving over time, can impede a company's growth. One solution to address this issue is the utilization of information technology (IT)-based services. IT governance is a methodology employed by companies or organizations to manage their IT resources. It encompasses aspects such as planning, implementation, monitoring, and evaluation of the IT systems utilized by the company or organization. The objective of IT governance is to ensure that the deployed IT supports the activities of a company or organization effectively and efficiently, while also ensuring the security and protection of the IT from various threats and undesirable actions [2].

Telkom University, a private higher education institution in Indonesia, was established on August 14, 2013, based on the Decree of the Director General of Higher Education, Ministry of Education and Culture, Number 309/E/O/2013. By 2022, Telkom University offered 34 study programs managed across seven faculties. The Faculty of Industrial Engineering is one of the faculties at Telkom University [3], maintaining an accreditation system to manage the quality of its programs. This accreditation system aims to enhance and maintain the quality of its programs. In its implementation, the system evaluates the overall performance of the Faculty of Industrial Engineering. The information gathered from this performance evaluation aids in quality improvement planning, identifying areas for improvement, and other related matters.

One of the challenges within the Faculty of Industrial Engineering at Telkom University is optimizing the value derived from IT investments. Assessing IT delivery value is increasingly crucial to measure the effectiveness of IT utilization. It is also vital to ensure that IT investments support the strategic and operational goals of the university and faculty.The LAM-INFOKOM [4] standardization has been adopted as the accreditation standard for all higher education institutions in Indonesia, in accordance with the Regulation of the Minister of Research, Technology, and Higher Education Number 62 of 2016 on the Higher Education Quality Assurance System. The standards set by LAM-INFOKOM are of paramount importance. Alignment with these standards helps ensure that the evaluation of IT delivery value is conducted in accordance with recognized industry guidelines.

A comprehensive analysis of IT delivery value is necessary due to the complex demands and expectations from internal and external stakeholders. Therefore, this study aims to investigate and assess the IT delivery value process at the Faculty of Industrial

*Corresponding Author Email: mhfasya@student.telkomuniversity.ac.id

Engineering, Telkom University. The analysis and evaluation of the process will be conducted using the LAM INFOKOM standards and the COBIT 2019 [5] Domain APO04 framework as its methodology. This study seeks to gain a deeper understanding of how effectively IT is utilized to achieve the goals of the Faculty of Industrial Engineering at Telkom University and to improve data-driven decision-making quality.

2. LITERATURE REVIEW

2.1 IT Governance

Information Technology (IT) governance serves as a framework that not only guides decision-making processes but also steers desired behaviors in utilizing IT [6]. Its chief aim is to assure the effective and efficient application of IT in bolstering the operations and endeavors of corporations or organizations. Employing IT governance provides stakeholders with the facility to oversee the company or organization more effectively, aids in the decision-making process, and ensures that the strategies being implemented are meticulously monitored. Furthermore, IT governance ensures the alignment of IT investments with the organization's overall business goals, affirming that the IT systems are dependable, secure, and in compliance with applicable laws and regulations. There are several critical reasons for the importance of IT governance, including the transition of IT's role from efficiency-focused to strategic at the corporate level, the failure of significant strategic IT projects due to their management solely by IT departments, the often ad-hoc or poorly planned nature of IT decisions at the board level, and the role of IT as a key driver in business transformation processes that significantly impact an organization's achievement of its vision, mission, and strategic goals. The success of IT implementations, as per Hartono, should be quantifiable through IT governance metrics [6].

2.2 LAM INFOKOM

Accreditation is a critical evaluative activity designed to assess the suitability of Study Programs and Higher Education Institutions, as outlined by LAM INFOKOM in 2022. Its primary goals are to confirm the eligibility of Study Programs against the National Standards of Higher Education and to ensure their quality in both academic and non-academic spheres, safeguarding the interests of both stakeholders and the broader community. The process involves a detailed examination of how Study Programs meet not only the National Standards of Higher Education (SN-Dikti) but also any additional standards set by individual universities to surpass these national benchmarks [4]. Under the prevailing legal framework, the Accreditation of Study Programs is conducted by Independent Accreditation Bodies (LAM), with LAM INFOKOM specifically handling accreditation for Informatics and Computer Science fields. The accreditation instrument developed by LAM INFOKOM incorporates several key considerations, including adherence to the latest accreditation regulations, a shift towards improving external efficiency within universities, the necessity of mutual recognition among quality assurance bodies, the imperative to enhance the quality and accountability of the accreditation process itself, and the development of a comprehensive quality assurance framework. This framework integrates both Internal Quality Assurance Systems (IQAS) and External Quality Assurance Systems (EQAS) to ensure a holistic approach to quality in higher education [7].

2.3 Higher Education Quality Assurance System (SPM Dikti)

The Directorate General of Higher Education Quality Assurance System (SPM Dikti) [4] represents a systemic endeavor aimed at the planned and sustained enhancement of higher education quality. Defined by the degree of alignment between higher education operations and the Directorate General of Higher Education (Dikti) Standards, which include both the National Standards of Higher Education (SN Dikti) and those set by each higher education institution, the quality of higher education is central to its mission (Kemenristekdikti, 2018). SPM Dikti's primary objective is to systematically and continuously uphold these standards, thereby cultivating a culture of quality-oriented thinking, attitudes, and behaviors across Indonesian universities. Structurally, SPM Dikti encompasses three main components: The Internal Quality Assurance System (SPMI), a systematic initiative by each university to autonomously manage and improve the quality of higher education in a deliberate and ongoing manner, with each institution responsible for the planning, execution, evaluation, control, and enhancement of its SPMI; The External Quality Assurance System (SPME) [8], an evaluative process through accreditation by entities such as the Independent Accreditation Bodies (LAM) and/or the National Accreditation Board for Higher Education (BAN-PT) to assess the eligibility of study programs and universities, managed and developed by BAN-PT and/or LAM through their accreditation processes; and The Higher Education Data System (PD Dikti), a nationally integrated database compiling information on higher education delivery across Indonesia, where data, execution details, and outcomes from both SPMI and SPME are documented and stored by the universities.

2.4 IT Delivery Value

IT delivery value can be defined as the value or benefits accrued through the use of information technology. It can be measured in terms of benefits and outcomes resulting from IT usage, such as enhanced efficiency, cost savings, improved customer satisfaction, and better decision-making quality. Developing and delivering IT value is a complex concept involving three components: the identification of potential value, effective conversion, and the realization of value [9]. These components are crucial for business and IT managers working towards common goals, as technology serves as a catalyst to drive various forms of organizational transformation and strategy [10].

2.5 COBIT 2019 and Domain APO04

COBIT (Control Objectives for Information and Related Technology) is a framework developed by ISACA (Information Systems Audit and Control Association) in 1996, designed to meet the governance and IT management needs of organizations/companies [11]. COBIT 2019, the latest version released in 2018 [5], represents an evolution from its predecessor, COBIT 5 [12]. Among the notable changes in COBIT 2019 is the increase in the number of governance system principles from five to six, a key expansion from the previous iteration. Another significant modification includes the growth in the number of objectives from 37 to 40.

The APO (Align, Plan, and Organize) domain within COBIT 2019 framework addresses the entire organization, its strategies, and supporting activities, encompassing IT aspects. This domain is detailed into 14 distinct processes, with one of them being APO04 [13] – Managed Innovation. APO04 focuses on methodologies for attaining competitive excellence, fostering business innovation, enhancing customer experiences, and augmenting the efficiency and effectiveness of operational processes through the strategic exploitation of IT advancements and novel technologies. The process includes a series of management practices aimed at fostering an innovative ecosystem. These practices entail creating an environment that encourages innovation (APO04.01), maintaining an acute awareness of the enterprise environment (APO04.02), continuously monitoring and scanning the technology landscape (APO04.03), evaluating the potential of emerging technologies and innovative concepts (APO04.04), recommending suitable initiatives for further exploration (APO04.05), and overseeing the implementation and utilization of innovative solutions (APO04.06).

3 RESEARCH METHODS

The research methodology adheres to the implementation cycle outlined in the COBIT 2019 Implementation Guide, progressing through four distinct stages. The first stage, "What are the drivers?", involves identifying issues related to the IT delivery value at the Faculty of Industrial Engineering, Telkom University, using a toolkit provided by ISACA. This step leads to the selection of the most relevant domain corresponding to the identified issues. In the second stage, "Where are we now?", data collection is conducted through interviews and document analysis. The gathered data is then utilized to assess design factors and capabilities based on the selected domain, aiming to identify areas requiring improvement. For this study, the chosen domain for capability assessment is APO04.

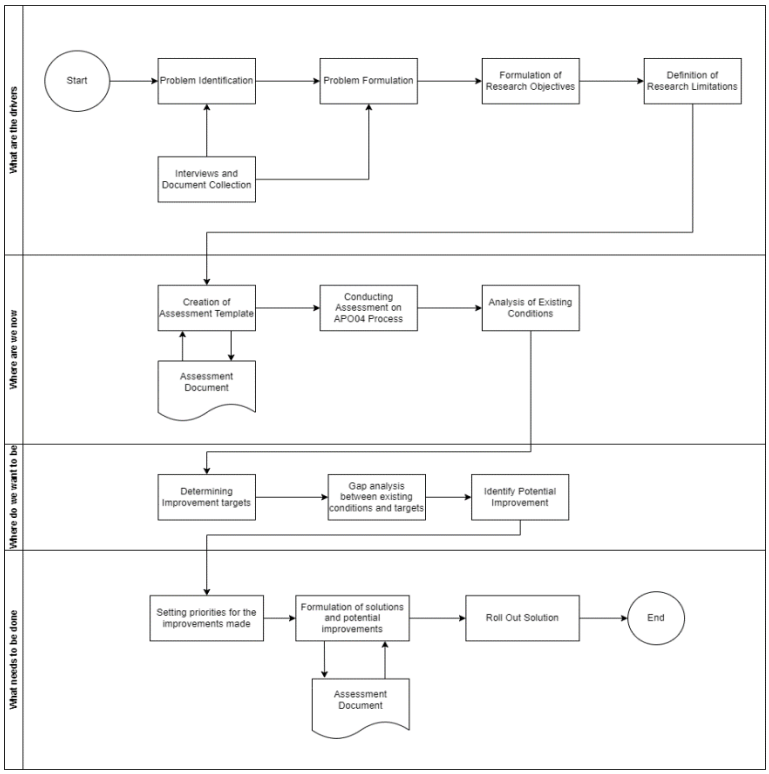

Figure 1. Research Flow

The research methodology adheres to the implementation cycle outlined in the COBIT 2019 Implementation Guide, progressing through four distinct stages. The first stage, "What are the drivers?", involves identifying issues related to the IT delivery value at the Faculty of Industrial Engineering, Telkom University, using a toolkit provided by ISACA. This step leads to the selection of the most relevant domain corresponding to the identified issues. In the second stage, "Where are we now?", data collection is

conducted through interviews and document analysis. The gathered data is then utilized to assess design factors and capabilities based on the selected domain, aiming to identify areas requiring improvement. For this study, the chosen domain for capability assessment is APO04.

The third stage, "Where do we want to be?", sets improvement targets based on the data obtained from the previous phase. This information supports a gap analysis to pinpoint potential enhancements in people, processes, and technology aspects. Following this, the fourth stage, "What needs to be done?", seeks the most appropriate solution recommendations for the identified issues. The outcomes of these recommendations can be employed by the Faculty of Industrial Engineering, Telkom University, to effectuate enhancements in the IT delivery value segment.

.

4 RESULTS AND DISCUSSIONS

4.1 Data Collection

In this study, data collection was conducted using both primary and secondary data sources. Primary data was acquired through direct interviews with representatives from Telkom University, while secondary data was sourced from documents that had been granted access approval by Telkom University. According to Ridwan (2010:51), the data collection process is crucial for gathering necessary information to achieve specific objectives, which may include research purposes, decision-making, or business planning. To ensure comprehensive and reliable data, this research employed several data collection methods: observation, involving direct observation of the subject matter; document study, which entailed the analysis of written documents such as reports, policies, and official decisions; and interviews, executed by posing oral questions to informants. The combination of these methods is expected to support the achievement of the research objectives by providing complete and accurate data.

4.2 Data Analysis

Table 1. Current State Assesment

No.	Activity	Fulfilment	Level
1	APO12.01 Collecting risk-related data	100% Fully	2
		100% Fully	3
		100% Fully	4
2	APO12.02 Analyzing or developing risk	100% Fully	3
		100% Fully	4
		50% Partially	5
3	APO12.03 Maintaining or managing the risk profile	100% Fully	2
		100% Fully	3
		100% Fully	4
4	APO12.04 Communicating risk	75% Largely	3
		100% Fully	4
5	APO12.05 Defining a risk management action portfolio	0% None	2
		100% Fully	3
6	APO12.06 Responding to risk	100% Fully	3
		100% Fully	4
		100% Fully	5

Table 2. Detailing Improvement People

Assessment	Potential Improvement	Type	Required Solution	Required Document
APO04.04-1	Providing detailed tasks and additional responsibilities related to technology evaluation.	Responsibility	Socialization regarding the detailed tasks and additional responsibilities associated with technology evaluation.	Draft document detailing the tasks and additional responsibilities linked to technology evaluation.

Table 3. Detailing Improvement Process

Assessment	Potential Improvement	Type	Required Solution	Required Document Assessment
APO04.04-1	Developing procedures for managing legal implications risks for technology evaluation needs	Procedure	Detailed Standard Operating Procedure (SOP) on managing legal implications risks for technology evaluation needs	Draft SOP document on managing legal implications risks for technology evaluation needs

	Developing work instructions for implementing procedures on managing risks of legal implications to ensure proper and measurable execution	Work Instruction	Work instruction detailing the application of procedures on managing legal implications risks for technology evaluation	Draft work instruction document for implementing procedures on managing legal implications risks for technology evaluation
APO04.05-3	Documenting a list of rejected proof of concepts along with their reasons for rejection	Record	Document detailing rejected proof of concepts along with reasons for rejection	Draft document listing rejected proof of concepts along with reasons for rejection

Table 4. Detailing Improvement Technology

Assessment	Required Solution	Type	Required Solution	Required Document Assessment
APO04.04-1	Development of tools to aid technology evaluation in terms of time aspect	Tools	Development of technology evaluation tools	Draft document of technology evaluation results
APO04.05-3	Addition of features to store rejected concept proofs along with reasons for rejection in the archive system	Features	Addition of feature to store rejected concept proofs and their reasons for rejection in the archive system	Draft document listing rejected concept proofs along with reasons for rejection

Table 5. Rollout Solution People

No	Potential Improvement	Recommendation Time	Q1	Q2	Q3	Q4
1	Providing additional task details and responsibilities related to technology evaluation	Socialization regarding additional task details and responsibilities related to technology evaluation	V			

Table 6. Rollout Solution Process

No	Potential Improvement	Recommendation	Q1	Q2	Q3	Q4
1	Developing procedures for addressing legal risk implications for technology evaluation needs	Detailed development of Standard Operating Procedures (SOP) regarding the management of legal risk implications for technology evaluation needs.		V		
2	Drafting work instructions for implementing procedures on addressing legal risk implications for technology evaluation needs to run smoothly and accurately	Development of work instructions for the implementation of procedures concerning the management of legal risk implications for technology evaluation needs.		V		
3	Documenting a list of rejected concept evidence along with reasons for rejection	Preparation of documentation regarding rejected concept evidence along with the reasons for rejection.			V	

Table 7. Roll Out Solution Technology

No	Potential Improvement	Recommendation	Q1	Q2	Q3	Q4
1	Development of tools to assist in technology evaluation with a focus on time efficiency to achieve maturity.	Creation of technology evaluation tools.	V	V		
2	Addition of features to store rejected concept evidence along with the reasons for rejection in the archival system.	Incorporation of features to store rejected concept evidence along with the reasons for rejection in the archival system.			V	V

5 CONCLUSSION

Based on the research conducted on IT Delivery Value at the Faculty of Industrial Engineering, Telkom University, the following conclusions are drawn:

1. The COBIT 2019 framework, particularly Domain APO04 from APO04.01 to APO04.06, can be mapped to LAM-INFOKOM standards.
2. Based on the assessment conducted at the Faculty of Industrial Engineering (FRI) at Telkom University, focusing on APO04, gaps were identified in part APO04.04 "Assess the potential of emerging technologies and innovative ideas,"

which scored 50% (partially) at level 2, and APO04.05 "Recommend appropriate further initiatives," which scored 67% (largely) at level 3. These gaps were then used as references for potential improvements.

3. The potential improvements for APO04.04 and APO04.05 led to recommendations across the aspects of people, process, and technology. In the people aspect, recommendations included providing detailed tasks and additional responsibilities related to technology evaluation. In the process aspect, recommendations were made to develop procedures for addressing legal implications risks needed for technology evaluation, establish work instructions for implementing procedures on managing risks of legal implications to ensure proper and measurable execution, and to document a list of rejected proof of concepts along with their reasons for rejection. In the technology aspect, recommendations included creating tools to assist in the technology evaluation in terms of timing to achieve maturity and adding features to store rejected proof of concepts along with their reasons for rejection in the archival system.

REFERENCES

[1] W. He, Z. (Justin) Zhang, and W. Li, "Information technology solutions, challenges, and suggestions for tackling the COVID-19 pandemic," *Int. J. Inf. Manage.*, vol. 57, no. December 2020, 2021, doi: 10.1016/j.ijinfomgt.2020.102287.

[2] M. S. Fauzi, M. Lubis, L. Abdurrahman, F. S. Lubis, and H. Fakhrurroja, "Optimizing IT Human Capital: Evaluating and Crafting an Innovative Management System with COBIT 2019," *ACM Int. Conf. Proceeding Ser.*, pp. 545–550, 2023, doi: 10.1145/3629378.3629445.

[3] N. H. Haay and M. N. N. Sitokdana, "Analysis of Information Technology Governance on Communication and Information Service of Papua Province Using COBIT 2019," *J. Inf. Syst. Informatics*, vol. 4, no. 2, pp. 349–360, 2022, doi: 10.51519/journalisi.v4i2.260.

[4] P. Weill and J. W. Ross, "IT Governance on One Page," *SSRN Electron. J.*, 2011, doi: 10.2139/ssrn.664612.

[5] S. Hadi, M. Kristiawan, and D. Wardiah, "Internal Quality Assurance System in an Effort to Improve the Quality of Education," *MUDIR J. Manaj. Pendidik.*, vol. 16, no. 1, p. 2023, 2023, [Online]. Available: https://ejournal.insud.ac.id/index.php/mpi/index.

[6] Asbeni, "Implementasi Sistem Penjaminan Mutu Internal Perguruan Tinggi (Suatu Studi Tentang Standar Operasional Prosedur) Di Politeknik Negeri Sambas," *J. Progr. Magister Ilmu Sos. Univ. Tanjungpura*, no. Vol 1, No 0001 (2013): ILMU ADMINISTRASI NEGARA, pp. 1–19, 2001, [Online]. Available: http://jurnal.untan.ac.id/index.php/jpmis/article/view/4150.

[7] H. A. Smith and J. D. McKeen, "Developments in Practice VIII: Enterprise Content Management," *Commun. Assoc. Inf. Syst.*, vol. 11, 2003, doi: 10.17705/1cais.01133.

[8] H. A. Smith and J. D. McKeen, "Developments in Practice VII: Developing and Delivering the IT Value Proposition," *Commun. Assoc. Inf. Syst.*, vol. 11, 2003, doi: 10.17705/1cais.01125.

[9] M. Spremić, "IT governance mechanisms in managing IT business value," *WSEAS Trans. Inf. Sci. Appl.*, vol. 6, no. 6, pp. 906–915, 2009.

[10] F. Shafa Salsabila Khansa1*, Della Novia Ramadhan2, Ahmad Fadil Alfarisy3, "Perkembangan Evaluasi Tata Kelola Teknologi Informasi: Literature Review," *J. Comput. Sci. Eng.*, vol. 3, no. 2, pp. 60–70, 2022, doi: e-ISSN 2721-0251.

[11] A. Ghufran Yuda, D. Takratama Savra, F. Rahmat Halim, M. Ripaldo Pratama, and N. Safiq Tama, "Audit Tata Kelola Universitas Islam Negeri Sultan Syarif Kasim Riau Kuliah Kerja Nyata Sistem," *J. Test. dan Implementasi Sist. Inf.*, vol. 2, no. 1, pp. 10–17, 2024.

[12] M. Lubis, R. C. Annisyah and L. Winiyanti, "ITSM Analysis using ITIL V3 in Service Operation in PT. Inovasi Tjaraka Buana," *IOP Conference Series: Materials Science and Engineering 847 2020.* DOI: 10.1088/1757-899X/847/1/012077.

[13] I. W. Wulandari, M. Lubis, W. Witjaksono and A. H. Azizah, "Implementation of Enterprise Resource Planning (ERP) using Integrated Model of Extended Technology Acceptance Model (TAM) 2: Case Study of PT. Toyota Astra Motor," *Int. Conf. on Cyber and IT Service Management (CITSM) 2019*. DOI: 10.1109/CITSM47753.2019.8965342.

[14] S. J. Prasetyo, M. Lubis, R. W. Witjaksono and A. H. Azizah, "Critical Failure Factors in Enterprise Resource Planning (ERP) Implementation: Case Study of PT. Toyota Astra," *Int. Conf. on Informatics and Computing (ICIC) 2019*. DOI: 10.1109/ICIC47613.2019.8985720.

[15] A. D. Putri, M. Lubis and A. H. Azizah, "Analysis of Critical Success Factors (CSF) in Enterprise Resource Planning (ERP) Implementation using Extended Technology Acceptance Model (TAM) at Trading and Distribution Company," *Int. Conf. on Electrical, Telec. and Com. Engineering (ELTICOM) 2020.* DOI: 10.1109/ELTICOM50775.2020.9230527.

[16] A. R. Lubis, M. Lubis and C. D. Azhar, "The Effect of Social Media to the Sustainability of Short Message Service (SMS) and Phone Call," *Procedia Computer Science 161, 687-695 2020.* DOI: 10.1016/j.procs.2019.11.172.

[17] L. Syafiraliany, M. Lubis and R. W. Witjaksono, "Analysis of Critical Success Factors from ERP System Implementation in Pharmaceutical Fields by Information System Success Model," *Int. Conf. On Informatics and Computing (ICIC) 2019.* DOI: 10.1016/j.procs.2019.11.172. DOI: 10.1109/ICIC47613.2019.8985678.

[18] S. Aini, M. Lubis, R. W. Witjaksono and A. H. Azizah, "Analysis of Critical Success Factors on ERP Implementation in PT. Toyota Astra Motor using Extended Information System Success Model," *Int. Conf. On Mechanical, Electronics, Computer and Industrial Technology (MECnIT) 2020.* DOI: 10.1016/j.procs.2019.11.172. DOI: 10.1109/MECnIT48290.2020.9166653.