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Internal conflict, active student participation and motivation to organiz

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ABSTRACT

Student organizations are a strategic platform for developing soft skills, leadership, and collaborative abilities in students, which are not directly acquired in the classroom. However, the effectiveness of these organizations is greatly influenced by students' motivation to actively participate, as well as the internal dynamics of the organization itself. Two important factors believed to influence this motivation are internal organizational conflict and the level of active student participation. This study aims to determine the extent to which internal conflict and active student participation influence student motivation to participate in organizations at ITB Indragiri. The research sample consisted of 160 students, and data were collected through a Google Form-based questionnaire. Data analysis used multiple linear regression in SPSS 23. The results showed that internal conflict has a very weak but significant influence on organizational motivation, and therefore cannot be ignored because it has the potential to disrupt students' psychological well-being. Meanwhile, active student participation has a stronger and more significant influence on motivation. Simultaneously, these two variables contribute to student motivation to participate in organizations. Therefore, it is recommended for ITB Indragiri to develop a more proactive student organization development system, including training in conflict management, organizational communication, and self-motivation. Organizational administrators need to create an inclusive organizational climate and encourage the active involvement of all members by providing space for actualization and appreciation in efforts to improve collaborative culture, open communication, and fair distribution of tasks to minimize internal conflict. This research can be developed by involving mediating or moderating variables and using a qualitative or mixed methods approach to understand more deeply the experiences of students in organizations, as well as expanding the scope of respondents across universities to make the results more generalizable.

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1. Introduction

On concept of controlling product quality and process efficiency is an important concept in production processes because of its impact on controlling product specifications. Statistical control charts are important tools used to ensure process efficiency and product quality. They are also used to identify process variances for the purpose of improving them. The current study aims to evaluate process quality, identify and diagnose deviations and their causes, if any, and determine ways to address them with the aim of reducing them. The study's problem revolves around answering a question about the extent to which the study sample product deviates from the specified specifications and whether the tolerance limits approved by the company are appropriate. The importance of the study stems from the importance of monitoring product quality, measuring process efficiency, and analyzing results to detect deviations in the production process and

determine their causes using statistical methods. The researchers selected a detergent manufacturing company as a sample for the study. Data and information about the production process were collected, and quality improvement tools were used, represented by mean, range, and standard deviation charts and (Cp, Cpk) calculations, to determine whether the processes were under statistical control or not. The topic of process efficiency has become a common denominator for various administrative, economic and industrial entities in developed and developing countries, as it is receiving increasing attention. Many researchers have addressed process evaluation, and researchers have used different charts. Therefore, (Ottenstreuer et al., 2021) used the normal CUSUM chart, which shows the best overall performance, While the performance of other schemes depends largely on the out-of-control scenario and the level of autocorrelation, respectively, which is what the current study adopted. (Alordiah & Oji, 2024) emphasized the importance of taking into account sample characteristics and statistical assumptions, a view the current study agreed with. The current study also agrees with (Wang et al., 2024), who emphasized the importance of estimating sample data when examining product quality. Therefore, sampling error and measurement uncertainty lead to miscalculations in evaluating product performance. This study also agrees with(Zwetsloot et al., 2024), who developed a four-stage framework for developing, implementing, using, and maintaining control charts. Numerous studies have led to the development of process and quality capability indicators and monitoring methods. These methods reduce costs and increase and improve product quality, which leads to customer satisfaction and maintaining market share

Today, the customer has an important role in the design and development of products. Therefore, the need has increased to understand and control processes to be more clear and specific to meet his requirements. As a result of the increased complexity occurring in production systems in industrial organizations, The need arose to apply quality management tools to assess the ability of production processes to meet pre-defined specification requirements. Process capacity is defined as the normal or true behavior when the process is stable and in a state of statistical control (Mahapatra et al., 2020). Process capability also refers to the ability to continue producing a specific product or service that meets the customer's needs according to specified specifications or parameters. The ability of the process is expressed by comparing the percentage of variation within the process to the limits of the specifications (allowances) specified for the product or service. The most commonly used indicators for comparing process variation with design specifications are the Cp index and the Cpk index. It is usually measured by graphing or by counting which parts are produced to meet specifications (Dogan & Areta Hiziroglu, 2024). Process capability is also defined as a measure of the changes that accompany production processes and is known mathematically as (s6), where (s) refers to the standard deviation of the statistically controlled production process, that is, when the variables in the production processes are the result of chance causes only.

Regarding the factors affecting the capacity of production operations, (Dimitrova et al., 2021) identify a number of these factors: effective planning and management of production capacity, the use of modern technological methods and automation of production, the degree of efficiency of use of production equipment, planning and implementation of maintenance and upkeep of production equipment, and the rational use of various resources, capabilities and qualifications of the workforce, analysis of the results of administrative decisions, risks, benefits and feedback, flexibility and timely response in the event of a problem.

A change in one or all of these factors leads to a change in the capacity of production operations. Therefore, the capacity of production operations must be determined by the consistency of the points mentioned above. The conditions for production operations are subject to two conditions: a) The data should have a normal distribution; b) Production processes are subject to statistical control (statistical control).

The ability of production processes is an important part of achieving quality, so its importance can be determined through the following points(Zacharias, 2022): a) By relying on the best designs, the process capability helps prevent defects during the production cycle; b) Determine the variation in the production process and determine the necessary methods to reduce it; c) Know the limitations of the process and know the factors that cannot be controlled; d) Benefiting from the results of process capability can be achieved in inspection, design of new technologies, and evaluation of used technologies; e) Comparison of tolerance limits with specifications.

On the other hand, Measuring and analyzing the capacity of production processes is an important part of evaluating the success or failure of the production process. In order to measure the capacity of the production process, two conditions must be met, namely that the data be normally distributed and that the

process be statistically controlled. Accordingly, there are several tools used to indicate the extent of discipline in the process, which are (Benková et al., 2024): a) Examine whether the process conforms to specifications by drawing a diagram; b) Study the process capacity and stability through control panels.

The Cp index generally takes the extent of the spread of the studied process and is not affected by a change in the average of the process. In order to be able to overcome this problem, we try to find new formulas to calculate the production capacity to address this deficit. Among these formulas are:(Mahapatra et al., 2020): a) Capacity index based on the two specifications Cpk; b) Capacity indicator based on the specifications and setting the Cpm target value; c) Capacity index based on the maximum CPU specifications; d) Capacity index based on the minimum specifications Cpl.

Through the use of these indicators, the ability of the production process can be judged according to the indicator values that are calculated from the process data and specification limits. In general, if the indicator is greater than or equal to 1, then the process capability is considered good, while various studies confirm that the value of 1.33 can be used as a value for the minimum acceptable value of Cp. However, if the indicator is less than 1, this means that there is a large number of units that do not conform to the specifications (Ostadi et al., 2021). There are many steps that are followed to analyze the ability of the process to produce products within tolerance limits, including: Determine the critical parameters for the selected process. These parameters may have been determined from drawings, inspections, or contracts, as well as work instructions (Benková et al., 2024), and Conduct data collection, where at least 60 data values are collected for each critical parameter,and Calculate process capability indicators, as well as estimate the process average and standard deviations obtained from the collected data (Qader et al., 2025), Conducting an analysis of the causes of variation, which in turn involves identifying the factors affecting the normal distribution of the process and thus it is possible to improve the process's ability.

On the other hand, the term quality control was used for the first time in the 1920s. Quality control is defined as a system of control to ensure that the correct standards are maintained in the production of products, and the products are usually inspected periodically (Kwilinski & Kardas, 2023).Quality is the ability of the product to meet consumer expectations. Quality is the sum of the features and characteristics of a product or service that affect its ability to meet the needs and requirements of the customer. Performance is affected by the quality of the product. The higher the quality of the product, the higher the level of performance, which leads to customer satisfaction(Adesanya & Adesanya, 2024).

Product quality has eight dimensions: performance, features, compatibility, reliability, durability, serviceability, aesthetics, and quality perceived by the consumer (Alsabbagh, 2023). An increase or increase in one of them does not mean an increase in the other dimensions. Quality is one of the main reasons for an organization's survival and success, distinguishing itself from competitors, and obtaining the largest market share (Hoe & Mansori, 2018). The dimensions of quality are defined as follows: Performance: It is one of the basic dimensions of quality, and it expresses what is required of the product and what the customer expects from the product.

Performance expresses the quality of the product and the characteristics expected in the product, through which the customer judges the quality of the product (Setiono & Hidayat, 2022), Features: These are the additional characteristics that enhance the attractiveness of the product or service to the user (Lone & Bhat, 2023), and sometimes they are the basic characteristics that exceed the requirements and expectations of customers and are verified as features with their potential to change the perception of the product (Puja Whardana et al., 2024), and Reliability: It refers to the product's ability to work with the same efficiency since its first use and for the period specified in its specifications without being exposed to malfunction or failure and this dimension is a key factor in determining the quality of the product for customers (Rasib et al., 2023) and Compatibility: It expresses the conformity of the product to the established standards, and that the product matches the specified characteristics, and Durability: It expresses the period of time during which the product is supposed to be usable before it becomes unusable, which requires its replacement (Chituru et al., 2024). and Service: It expresses the quality and speed of providing after-sales services, which include repair, maintenance, or installation of the product in response to the customer's request (Tirtayasa, 2022), and Aesthetics: It refers to some specifications in the external appearance of the product, and the evaluation of the extent of the product's aesthetics varies from one person to another depending on the culture and preferences of the customer, and it is one of the methods of attraction that prompts him to buy the product, and Tangible quality: Brand reputation is one of the main factors influencing the purchase decision when the customer

does not have clear details about the product's characteristics (Nguyễn Văn Nhân & Nguyễn Văn Lực, 2023). Therefore, tangible quality is directly linked to the brand (Puja Whardana et al., 2024).

Quality control: Industrial growth in the early years of the twentieth century led to the need to recognize that quality is the responsibility of management. Quality managers must be independent in their decision-making role. The term (quality control) was first used in the 1920s. Quality control is defined as a system of control to ensure that the correct standards are maintained in the production of products, and the products are usually inspected periodically. Quality control tools are considered one of the basic elements of product quality management, and can be considered a system used to maintain the required level of product quality. Among these tools are the following: Process flow maps: It is a diagram through which the flow of the process is described and the steps that the product goes through or the procedures that the service goes through. Through this map, the current processes and their sequence can be described, and this leads to clarifying the main processes required to produce products or provide services.

Through this tool, amendments and improvements in service activities and production processes are suggested (Santos et al., 2023), Pareto chart: It is a graphical representation of the problems present in the process, through which the problems are arranged descending from the most occurring to the least occurring, that is, according to their importance and frequency of occurrence, and Cause and effect diagram: Or what is called the Ishikawa diagram, named after the Japanese scientist Karo Ishikawa, who developed this technique in 1943. This technique was used by quality improvement teams in organizations, the aim of which is to identify problems or goals to be achieved, and Scatter diagram: It is a chart or drawing that helps to know the relationship between two quantitative variables and present and display this relationship, as it helps to make the process outputs of high quality as well as make sound decisions based on knowledge of the relationship between the two variables, and Monitoring maps: Monitoring maps are the backbone of statistical monitoring of operations, through which continuous statistical analysis of changes in the process is conducted with the aim of monitoring and controlling the quality of products or services and improving the performance of operations, Histogram: It is a graphical representation that provides a simple explanation and analyzes the data collected from the production or service process with the aim of studying the quality of its outputs and discovering defects and the extent of deviation from the average, and Monitoring maps: It is a graph that shows the deviations and changes that are likely to occur in quality characteristics over time.

Through these maps, it is possible to distinguish between natural changes that are due to general underlying causes and changes that are due to specific causes. Monitoring maps are It is a graph that shows the changes that occur in the characteristics of the product over time, and is used to display data on a specific phenomenon sequentially during a specific period of time. By looking at the graph, the quality officer or production manager can know the stability of the readings for certain characteristics or the extent of fluctuation occurring in them, and thus identify the problems that affect the quality of the product in a timely manner, which helps him make decisions that address the error and solve the problem, leading to improved performance. It is also possible, through quality maps, to determine whether the deviations are due to natural changes or due to abnormal changes and are due to special reasons, as well as knowing whether the process is proceeding under statistical control.

2. Research Method

This study were designed by quantitative explanatory with approach associative causal, namely for test influence between variables free and variable bound in a way empirical approach quantitative aim for measure in a way numeric connection between variable, the result of which can generalized and processed with statistical tools (Satriawan, 2020). Explanatory design used Because study This explain connection cause and effect between internal organizational conflict (X_1) and participation active students (X_2) towards motivation organize (Y).

The indicators for each variable (X_1, X_2, and Y) were adapted from instruments validated in previous research. To ensure the validity and representativeness of the collected data, the researchers took several steps, including an affirmation at the beginning of the questionnaire that the data would be used for scientific purposes and that the respondents' identities would be kept confidential. Several reverse-question items and attention checks were included to test the consistency of responses. The questionnaire was distributed to only 160 respondents (total sampling), namely active students involved in student organizations at ITB Indragiri (Sugiyono, 2022). The questionnaire was distributed through official media such as campus organization

WhatsApp groups. The Google Form system was set to be filled in only once using a Gmail account to avoid duplicate entries (Pertiwi, 2020)(Ramadhan, 2022)(Putra, 2024).

The validity technique was carried out through a content validity test by correlating the scores of each item with the total score, where the correlation coefficient (r count) was greater than r table at a significance level of α = 5% (0.05). Meanwhile, the reliability of the instrument was assessed using the SPSS program with a Cronbach Alpha (α) statistical test > 0.60. The analysis stages carried out were through data filtering, statistical assumption tests (normality, linearity, multicollinearity, and heteroscedasticity), instrument validity and reliability tests, Pearson correlation analysis, to see the strength of the relationship between variables, Multiple Regression tests using the formula Y = a + b1X1 + b2X2 + e for simultaneous and partial (Ghozali, 2021), and interpretation of results and drawing conclusions based on the significance value (p-value < 0.05) and the coefficient of determination (R^2). The data collection period began June 24 - July 10, 2025. The questionnaire was distributed via Google Form to 160 respondents who were members of student organizations (BEM, UKM, Himpunan) at ITB Indragiri.

3. Result and Discussion

Table 1. Correlation coefficient (r) value

		Internal Conflict	Active Student Participation	Motivation to Organize
Internal Conflict	Pearson Correlation	1	,020	.165 *
	Sig. (2-tailed)		,802	,037
	N	160	160	160
Active Student Participation	Pearson Correlation	,020	1	.265 **
	Sig. (2-tailed)	,802		,001
	N	160	160	160
Motivation to Organize	Pearson Correlation	.165 *	.265 **	1
	Sig. (2-tailed)	,037	,001	
	N	160	160	160

Based on table 1, it is known that mark coefficient correlation internal conflict, namely 0.165, is in the range of 0.00-0.199, meaning level connection internal conflict against motivation organize is in the very low category. The coefficient value participation active namely 0.265, is in the range of 0.20-0.399, which shows level connection participation active student to motivation organize is in the category low.

Table 2. Value of the determination coefficient (r^2)

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.309 [a]	,096	,084	2,681

Based on table 2, can delivered that acquisition mark coefficient determination (R^2) of 0.096. This show magnitude the influence exerted internal conflict and participation active student for motivation organize by 9.6%.

Table 3. Simultaneous test results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	119,422	2	59,711	8,310	.000 [b]
	Residual	1128,178	157	7,186		
	Total	1247,600	159			

Seen from table 3, has obtained F value of 8.310. This value show more big from F_{table} 3,053, so can it is said that There is the influence exerted conflict interla and participation active student to motivation organizing in the ITB Indragiri environment, even though the percentage given in a way simultaneously classified as low namely 9.6%, however still just show motivation organize can influenced by both independent variables.

Table 4. t-test results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6,652	1,690		3,936	,000
	Internal Conflict	,221	,105	,160	2,102	,037
	Active Student Participation	,363	,105	,262	3,450	,001

Referring table 4, presented that hypothesis test value (t-test) of internal conflict obtained namely 2,102 more big from t_{table} 1.975 with level significance 0.000, so show that internal conflict gives influence to motivation organizing. Participation t-test value active student namely 3,450 more big from t_{table} 1.975, which means participation active student influential to motivation organize.

Discussion

Correlation results show that mark coefficient correlation internal conflict against motivation organize of 0.165, is in very low category (range 0.00–0.199). Meanwhile that, participation active student get coefficient correlation of 0.265, which is in category low (range 0.200–0.399). Findings this strengthen statement that although internal conflict can give pressure to member organization, in scale certain conflict can bring up reflection critical which is precisely increase participation and motivation (Luthans, 2021). However, when conflict No completed, he more tend weaken motivation members (Rahim, 2023). In the context of this, the result show that internal conflict at ITB Indragiri has very weak correlation to motivation organize students. This shows that existing conflicts Not yet to the point of influence motivation in a way significant. While participation active student show more correlation strong compared to internal conflict.

Coefficient value determination (R^2) of 0.096, which means internal conflict and participation active student in a way together only explains 9.6% of the variation in motivation organize. In other words, 90.4% of the variation motivation organize influenced by other variables outside the model. Findings This show that influence from internal conflict and participation active limited, although significant. In fact, role conflict in organizations, which is a form of internal conflict, influences the condition of academic burnout, which has implications for decreased motivation in organizations or academics (Rohmahwati et al., 2025).

Calculated F value of 8,310, which is more big from the F table 3.053, which means that in a way simultaneous, internal conflict and participation active student influential in a way significant to motivation organize. Although percentage its influence small (9.6%), in general statistics of this model means, so that second variables independent the no can ignored in influence motivation students. That motivation in organization no only influenced by personal factors, but also by dynamics internal social and patterns interaction interpersonal development in the organization (Robbins, 2022).

Hypothesis testing show that internal conflict: t count = 2.102 > t table = 1.975 (sig. 0.000), meaning internal conflict has an impact significant to motivation organizing and participation active students: t count = 3.450 > t table = 1.975, which means influential significant to motivation organize. This is indicates that although influence internal conflict against motivation classified as weak, deep context significant in a way statistics, conflict still become factors that are not can ignored. This situation could be caused by the high workload placed on students involved in organizations and academic activities, which can trigger individual conflict with other members of the organization. Students experiencing dual role conflict, particularly between organizational and academic activities, show decreased performance without the support of high work motivation. This illustrates a form of internal conflict encapsulated in the challenge of dual responsibilities (Meitisa & Saputri, 2025). Meanwhile, strong group cohesiveness reflecting a collective orientation decreases social loafing behavior and increases members' responsibility for organizational tasks. This illustrates the relationship between active participation, collective responsibility, and organizational commitment (Akbar et al., 2024).

The statistically significant significance of internal conflict and active participation in this study can be interpreted practically as two important elements that need to be wisely managed within a student organization environment. Although internal conflict showed a relatively weak relationship with organizational motivation, its statistical significance indicates that conflict—no matter how small—can affect the psychological dynamics and morale of members. Therefore, student organizations need to have sound conflict management mechanisms, such as regular deliberation forums, assertive communication training,

and responsive leadership, so that emerging conflicts can be channeled constructively, rather than destructively. Meanwhile, active participation was shown to have a stronger relationship with organizational motivation. This suggests that the more actively a student is involved in organizational activities, the higher their intrinsic motivation to contribute and develop. Practically, this implies the importance of building a participatory culture within the organization through member empowerment, involvement in decision-making, and the creation of an inclusive and open organizational environment.

In the context of developing leadership qualities and collaboration, these results imply that a student organization leader is not only required to be able to resolve conflict but also to be a facilitator of active participation. Effective leaders are those who can create spaces for dialogue, manage differences healthily, and encourage all members to actively participate in various programs. In this way, student organizations can become fertile grounds for the growth of collaborative leadership values, social sensitivity, and collective responsibility.

In the context of this research, no analysis was conducted on the differences in the influence of internal conflict and active participation across different types of student organizations, such as Student Executive Board (BEM), Student Activity Unit (UKM), and Departmental Associations. This decision was made considering that the primary objective of the research was to gain a general understanding of the dynamics of student organizations as a whole within ITB Indragiri. Analyzing each type of organization separately would require a more complex approach, both in terms of research design and sufficient number of respondents for each group, to allow valid interpretation of the results.

This study has several limitations that require consideration. First, the scope of the study was limited to the influence of internal conflict and active participation on organizational motivation in general, without distinguishing the characteristics of each type of student organization, such as BEM, UKM, and Students Associations. Each type of organization has a different structure, goals, and dynamics, which likely influence conflict patterns, participation intensity, and motivational styles. Second, the data collection technique was conducted online via Google Forms, thus potentially introducing response bias, particularly related to the honesty and seriousness of the questionnaire. Third, this study used a quantitative correlational approach, which is limited in exploring contextual aspects or students' subjective experiences in depth.

Therefore, suggestions for future research exploration include the need for a mixed methods approach, combining quantitative surveys with interviews or focus group discussions (FGDs), to capture the richer psychosocial nuances of student organizational motivation. Furthermore, the study could be expanded by analyzing the influence of conflict and active participation differently across each type of student organization, thus providing a more contextual and targeted mapping of leadership development and organizational management strategies. The addition of variables such as social support, leadership style, or organizational culture could also enrich the analytical model and generate more comprehensive intervention recommendations.

4. Conclusion

Based on the research results, it can be concluded that internal conflict and active student participation both have a significant influence on organizational motivation, although the degree of influence varies. Internal conflict shows a very weak relationship with motivation, indicating that the conflict is not yet large or intense enough to significantly affect students' organizational enthusiasm. However, statistically, this conflict remains influential and cannot be ignored because it can have certain psychological effects that impact organizational dynamics. Meanwhile, active student participation shows a stronger relationship with organizational motivation. This illustrates that students' active involvement in organizational activities contributes positively to the development of their intrinsic motivation, both socially and academically. This finding reinforces the view that active students tend to have a higher internal drive to develop their abilities and establish constructive social interactions within the organizational environment. Although the overall influence of these two variables on student motivation is relatively low, simultaneously both are proven significant. This indicates that internal organizational dynamics, such as conflict and active participation, remain important factors influencing student organizational motivation, although many other factors outside the model also play a role. Therefore, conflict management and increasing active participation are relevant strategic steps in encouraging students' motivation to play an active role in organizations.

The results of this study are highly relevant to be used as a basis for designing intervention models or soft skills training for administrators and members of student organizations. The results show that internal conflict and active participation have a significant effect on organizational motivation, so that training can be focused on improving conflict management skills (interpersonal & organizational), improving collaboration skills and active participation of members, fostering intrinsic motivation in organizing, preparing reflective and adaptive student organization leaders. The ideal training modules suggested are Self-Awareness and Organizational Motivation, Internal Conflict Management, Active Participation and Inclusive Leadership, and Organizational Support Soft Skills.

References

Adesanya, O., & Adesanya, A. (2024). *Imapct of Product Quality on Organisational Performance in Nigeria Imapct of Product Quality on Organisational Performance in Nigeria*. *October*.

Akbar, J., Wibowo, D. S., & Widyarini, N. (2024). Social Loafing Pada Organisasi Mahasiswa: Peran Kohesivitas Kelompok Dan Self-Efficacy. *Jurnal Psikologi*, *17*(2), 304–314. https://doi.org/10.35760/psi.2024.v17i2.10117

Alordiah, C., & Oji, J. (2024). Test equating in educational assessment: a comprehensive framework for promoting fairness, validity, and cross-cultural equity. *Asian Journal of Assessment in Teaching and Learning*, *14*(1), 70–84.

Alsabbagh, A. A. A. (2023). Evaluating the Quality of Delivery Service From the Customer'S Point of View Using the Importance-Performance Matrix. *International Journal of Professional Business Review*, *8*(4), 1–16. https://doi.org/10.26668/businessreview/2023.v8i4.1742

Benková, M., Bednárová, D., & Bogdanovská, G. (2024). Process Capability Evaluation Using Capability Indices as a Part of Statistical Process Control. *Mathematics*, *12*(11). https://doi.org/10.3390/math12111679

Chituru, C. M., Ho, S. B., & Chai, I. (2024). Integrating Spatial Computing with Clinical Pathology for Enhanced Diagnosis and Treatment Informatics in Healthcare. *International Journal on Informatics Visualization*, *8*(3–2), 1762–1771. https://doi.org/10.62527/joiv.8.3-2.2951

Dimitrova, K., Panayotova, T., & Veleva, N. D. (2021). Model for Research into the Factors Influencing the Effective Planning and Management of Production Capacity. *ANNUAL JOURNAL OF TECHNICAL UNIVERSITY OF VARNA, BULGARIA*, *5*(1). https://doi.org/10.29114/ajtuv.vol5.iss1.237

Dogan, O., & Areta Hiziroglu, O. (2024). Empowering Manufacturing Environments with Process Mining-Based Statistical Process Control. *Machines*, *12*(6), 1–18. https://doi.org/10.3390/machines12060411

Hoe, L. C., & Mansori, S. (2018). The Effects of Product Quality on Customer Satisfaction and Loyalty: Evidence from Malaysian Engineering Industry. *International Journal of Industrial Marketing*, *3*(1), 20. https://doi.org/10.5296/ijim.v3i1.13959

Kwilinski, A., & Kardas, M. (2023). Enhancing Process Stability and Quality Management: a Comprehensive Analysis of Process Capability Indices. *Virtual Economics*, *6*(4), 73–92. https://doi.org/10.34021/ve.2023.06.04(5)

Lone, R. A., & Bhat, M. A. (2023). Impact of Product Quality on Customer Satisfaction: Evidence from Selected Consumer Durables. *International Journal for Research Trends and Innovation*, *8*(4), 1014–1024.

Mahapatra, A. P. K., Song, J., Shao, Z., Dong, T., Gong, Z., Paul, B., & Padhy, I. (2020). Concept of process capability indices as a tool for process performance measures and its pharmaceutical application. *Journal of Drug Delivery and Therapeutics*, *10*(5), 333–344. https://doi.org/10.22270/jddt.v10i5.4288

Meitisa, N. I., & Saputri, S. Y. (2025). *Pengaruh Konflik Peran Ganda dan Motivasi Kerja terhadap Kinerja pada Mahasiswa Universitas Primagraha di Kota Serang*. *1*, 781–791.

Nguyễn Văn Nhân, & Nguyễn Văn Lực. (2023). Service Quality Factors Impact on Customer Satisfaction: Research at Loc Lam Furniture Trading Service Co. Ltd. *Malaysian Journal of Business, Economics and Management*, *October*, 54–62. https://doi.org/10.56532/mjbem.v2i2.18

Ostadi, B., Taghizadeh-Yazdi, M., & Mohammadi-Balani, A. (2021). Process capability studies in an automated flexible assembly process: A case study in an automotive industry. *Iranian Journal of Management Studies*, *14*(1), 1–37. https://doi.org/10.22059/IJMS.2020.222198.672415

Ottenstreuer, S., Weiß, C. H., & Knoth, S. (2021). Control charts for monitoring a Poisson hidden Markov process. *Quality and Reliability Engineering International*, *37*(2), 484–501.

Pertiwi, B. D. (2020). *WS: Sistem Pengarsipan Elektronik Menggunakan Google Forms pada Laboratorium Universitas Dinamika*. Universitas Dinamika.

Puja Whardana, G., Irwati, D., & Dwi Miharja, M. N. (2024). Analysis of Carton Packaging Quality Control Using Statistical Quality Control Methods at PT XYZ. *International Journal of Innovative Science and Research Technology (IJISRT)*, *9*(7), 212–221. https://doi.org/10.38124/ijisrt/ijisrt24jul580

Putra, B. A. F. H. (2024). *Google App Script Untuk Pengembangan Sistem Informasi Laboratorium*. Universitas Islam Indonesia.

Qader, H. M., Birdawod, H. Q., Qader, H. M., & Sedeeq, B. S. (2025). *Capability Process to Optimize Specification by Impact of Wavelet Analysis*. *9*(1), 53–60. https://doi.org/10.24086/cuejhss.vol9n1y2025.pp

Ramadhan, M. (2022). *Ta'āruf Melalui Aplikasi Tinder dalam Perspektif Fikih Munākahāt*. Institut Agama Islam STIBA Makassar.

Rasib, A. H. A., Musazzali, M., Abdullah, R., Boejang, H., Hanizam, H., & Rafaai, Z. F. M. (2023). Process Capability

Study for Improvement of Product Reliability At Food and Beverage Industry. *Journal of Engineering Science and Technology*, *18*(1), 357–375.

Rohmahwati, D., Hutahaean, E. S. H., & Muzzamil, F. (2025). *Antara organisasi dan akademik : Dinamika performa mahasiswa*. *8*, 83–97.

Santos, E., Lima, T. M., & Gaspar, P. D. (2023). Optimization of the Production Management of an Upholstery Manufacturing Process Using Lean Tools: A Case Study. *Applied Sciences (Switzerland)*, *13*(17). https://doi.org/10.3390/app13179974

Setiono, B. A., & Hidayat, S. (2022). Influence of Service Quality with the Dimensions of Reliability, Responsiveness, Assurance, Empathy and Tangibles on Customer Satisfaction. *International Journal of Economics, Business and Management Research*, *06*(09), 330–341. https://doi.org/10.51505/ijebmr.2022.6924

Tirtayasa, S. (2022). The Effect Of Product Quality, Price, And Innovation On Marketing Performance Moderated Consumer Purchasing Power In UMKM Of Boba Drinks In Deli Serdang. *International Journal of Science, Technology & Management*, *3*(6), 1731–1742. https://doi.org/10.46729/ijstm.v3i6.642

Wang, L., Bo, G., Du, M., & Cheng, H. (2024). Investigating the Effect of Small Sample Process Capability Index Under Different Bootstrap Methods. *International Journal of Advanced Computer Science and Applications*, *15*(4), 547–555. https://doi.org/10.14569/IJACSA.2024.0150457

Zacharias, M. (2022). The Importance of Quality Control for The Success of A Company. *Asian Journal of Logistics Management*, *1*(2). https://doi.org/10.14710/ajlm.2022.16787

Zwetsloot, I. M., Jones-Farmer, L. A., & Woodall, W. H. (2024). Monitoring univariate processes using control charts: Some practical issues and advice. *Quality Engineering*, *36*(3), 487–499.