THE QUEST Journal of Multidisciplinary Research and Development
ISSN 1908-3211 (Online) | ISSN 1908-322X (Print)
P-ISSN: 1908-322X and E-ISSN: 1908-3211
Vol.4 No.2 (2)
Received:08-08 / Revised: 09-09/ Accepted: 12-12-2025 https://neust.journalintellect.com/quest

ASK-COT: An Executive Decision Support System for the Planning Unit of Aurora State College of Technology

Dale Lyko Abion[1], Allen Paul Esteban

Aurora State College of Technology, Brgy. Zabali, Baler, Aurora, 3200, Philippines
dalelyko.abion@ascot.edu.ph

Abstract. Strategic planning in higher education institutions depends on timely, accurate, and consolidated data to support informed decision-making. At Aurora State College of Technology (ASCOT), the Planning Unit has encountered persistent challenges in consolidating reports from various academic and administrative units, leading to delays, inconsistencies, and limited capacity for effective governance and performance monitoring. To address these issues, this study developed the ASK-COT: An Executive Decision Support System for the Planning Unit of Aurora State College of Technology designed to streamline data submission, consolidation, and analysis, thereby improving compliance monitoring, strategic planning, and resource allocation.

ASK-COT was developed using the Phased Development Approach inspired by the Waterfall Model, ensuring a systematic process through requirements analysis, system design, development, testing, implementation, and maintenance. The system incorporates modules for online report submission, compliance tracking, key performance indicator dashboards, and analytical tools that generate decision-support insights for institutional leaders.

The system's quality was evaluated following the ISO/IEC 25010 software quality model, with assessments conducted by IT experts and key stakeholders. ASK-COT achieved the following mean scores across nine quality characteristics: Functional Suitability (3.73), Performance Efficiency (3.60), Compatibility (3.55), Interaction Capability (3.69), Reliability (3.73), Security (3.90), Maintainability (3.68), Flexibility (3.68), and Safety (3.66). Security obtained the highest rating, reflecting robust measures for data integrity and confidentiality. Functional Suitability and Reliability also received strong ratings, demonstrating the system's effectiveness in meeting user requirements and maintaining consistent performance.

THE QUEST Journal of Multidisciplinary Research and Development
ISSN 1908-3211 (Online) | ISSN 1908-322X (Print)
P-ISSN: 1908-322X and E-ISSN: 1908-3211
Vol.4 No.2 (2)
Received:08-08 / Revised: 09-09/ Accepted: 12-12-2025 https://neust.journalintellect.com/quest

Evaluation results affirm that ASK-COT meets high standards for functionality, usability, and security, enabling ASCOT's Planning Unit to operate with greater efficiency and accuracy. Its implementation is expected to strengthen institutional governance, enhance performance monitoring, and support ASCOT's readiness for university status. Furthermore, ASK-COT's design and development process can serve as a replicable model for other higher education institutions seeking to adopt data-driven decision support solutions.

Keywords: Executive Decision Support System, Strategic Planning, Decision Making, Data-Driven, ISO/IEC 25010 Quality Standards

1. Introduction

Closures and bankruptcies of institutions have become a growing concern, as they disrupt functionality and negatively impact stakeholders and the broader community. In the education sector, such failures lead to reduced access to quality education, unemployment, and loss of institutional credibility. Many of these closures have been linked to poor decision-making processes (Flores, 2023; Condez, 2024). Aurora State College of Technology (ASCOT), the only state university and college (SUC) in the province of Aurora, is currently striving to achieve university status. Attaining this goal requires accurate, timely, and well-organized data to support decision-making in institutional planning, resource allocation, and strategic development in alignment with ASCOT's vision. However, the institution faces increasing challenges due to its growth, making strategic planning more complex and demanding (Mandap & Almario, 2024).

One of the pressing issues at ASCOT is the poor compliance in the submission of reports from deans and unit heads to the planning unit. At present, the institution still relies on manual processes for report submission, which include vital documents used in strategic planning, resource allocation, and performance evaluation. This manual approach is prone to delays, loss of traceability, and difficulty in identifying non-compliant units, thereby affecting ASCOT's ability to deliver quality services and meet its mission and vision (Javier, 2019).

To address these challenges, the proposed system, ASK-COT, has been designed as an executive decision support system (DSS) that consolidates and centralizes reports from different units and schools of the institution. By enabling real-time access, tracking, and analysis of submitted data, the system empowers

THE QUEST Journal of Multidisciplinary Research and Development
ISSN 1908-3211 (Online) | ISSN 1908-322X (Print)
P-ISSN: 1908-322X and E-ISSN: 1908-3211
Vol.4 No.2 (2)
Received:08-08 / Revised: 09-09/ Accepted: 12-12-2025 https://neust.journalintellect.com/quest

institutional leaders to make informed, timely, and strategic decisions (Teng et al., 2022; Namoco et al., 2021).

Decision support systems have been applied in various contexts, from optimizing administrative processes to predictive analytics, and have been proven to improve efficiency, accountability, and data reliability. Studies have demonstrated the benefits of AI-based data-driven decision-making (Teng et al., 2022), linear programming for optimizing resources (Namoco et al., 2021), predictive analytics for enrolment forecasting (Esquivel & Esquivel, 2021), and scholarship grant allocation (Fajardo et al., 2024). Other works, such as HEEDS for student records management (Javier, 2019) and clinical decision support in healthcare (Sutton et al., 2020), highlight the importance of system usability, stakeholder engagement, and sustainable maintenance. These findings support the integration of ISO/IEC 25010 quality standards into DSS development to ensure functionality, performance efficiency, and reliability (Mandap & Almario, 2024).

The primary objective of this study is to design, develop, and evaluate ASK-COT as a centralized, data-driven executive DSS for ASCOT's planning unit, ensuring compliance monitoring, improved data accuracy, and timely access to reports for strategic decision-making. The originality of this work lies in its tailored approach to ASCOT's operational needs, its integration of compliance tracking with ISO/IEC 25010-based evaluation, and its focus on addressing institutional bottlenecks in strategic planning and resource allocation. By streamlining report submission and decision-making processes, ASK-COT aims to contribute to ASCOT's readiness for university status and enhance its capacity for data-informed leadership (Flores, 2023; Condez, 2024; Mandap & Almario, 2024).

2. Methodology

The development of ASK-COT employed a Phased Development Approach based on the Waterfall Model. This ensured a systematic transition from requirements gathering to system deployment. Requirements were obtained through key informant interviews, document analysis, and observation of current reporting processes in Aurora State College of Technology (ASCOT). The design stage involved the creation of system design, database diagrams, and user interface mock-ups, which were refined in consultation with IT experts and administrative personnel.

THE QUEST Journal of Multidisciplinary Research and Development
ISSN 1908-3211 (Online) | ISSN 1908-322X (Print)
P-ISSN: 1908-322X and E-ISSN: 1908-3211
Vol.4 No.2 (2)
Received:08-08 / Revised: 09-09/ Accepted: 12-12-2025 https://neust.journalintellect.com/quest

Development was implemented using modern web technologies, incorporating modules for online data submission, automated compliance tracking, and report generation. Testing followed the ISO/IEC 25010 quality framework, covering functional suitability, performance efficiency, compatibility, interaction capability, reliability, security, maintainability, flexibility, and safety. Results guided refinements prior to system rollout.

2.1 Sampling Procedure

The selection of respondents was carried out using purposive sampling, a non-probability sampling technique wherein participants are deliberately chosen based on their knowledge, expertise, and relevance to the objectives of the research.

This method was deemed appropriate to ensure that the feedback and evaluation came from individuals with direct experience in institutional planning, data management, and information systems.

2.2. Respondents

The respondents of this study included key stakeholders and end users from Aurora State College of Technology (ASCOT), along with IT experts for system evaluation. Participants comprised unit heads from non-academic offices, deans as heads of schools, a planning officer, executive officials (VPAA, VPFP, and the President), and MIS Unit personnel responsible for implementation and support. Additionally, IT experts assessed the system's quality based on ISO/IEC 25010 standards. In total, there were five (5) unit heads, five (5) deans, one (1) planning officer, three (3) executive officials, one (1) MIS Unit staff, and ten (10) IT experts, ensuring balanced administrative, operational, and technical perspectives for evaluating the ASK-COT system.

Table 1. *- Distribution of Respondents*

Key Stakeholders and End Users	Position/Role	Number of Respondents	Percentage (%)
Unit Heads	Non-Academic Units	5	20%
Deans	Head of Schools	5	20%
Planning Unit Staff	Planning Officers	1	4%
Executive Officials	VPAA, VPFP, President	3	12%
MIS Unit	Implementation and Support	1	4%
Respondents			
IT Experts	Evaluation of System Quality	10	40%
TOTAL		**25**	**100%**

THE QUEST Journal of Multidisciplinary Research and Development
ISSN 1908-3211 (Online) | ISSN 1908-322X (Print)
P-ISSN: 1908-322X and E-ISSN: 1908-3211
Vol.4 No.2 (2)
Received:08-08 / Revised: 09-09/ Accepted: 12-12-2025 https://neust.journalintellect.com/quest

2.2.1 Research Site

The study was conducted at Aurora State College of Technology (ASCOT) in Baler, Aurora, Philippines. ASCOT was selected as the research site due to the centralized role of its Planning Unit in consolidating institutional reports, alongside the challenges it faces in integrating data from various academic and administrative units.

Figure 1. – Research Locale

The institution's commitment to innovation and its supportive administrative environment, including the involvement of the Planning Unit, MIS Unit, and executive officials, provided favorable conditions for the development and pilot implementation of the ASK-COT executive decision support system. This setting offered a practical environment to evaluate the system's effectiveness in enhancing data management and decision-making processes in a real academic context.

THE QUEST Journal of Multidisciplinary Research and Development
ISSN 1908-3211 (Online) | ISSN 1908-322X (Print)
P-ISSN: 1908-322X and E-ISSN: 1908-3211
Vol.4 No.2 (2)
Received:08-08 / Revised: 09-09/ Accepted: 12-12-2025 https://neust.journalintellect.com/quest

3. Results and Discussion

3.1. System Performance Benchmark

The evaluation of the ASK-COT system was conducted based on ISO/IEC 25010 product quality standards, yielding an overall performance rating that reflects high system quality across all measured attributes. As shown in the results, the highest weighted mean was recorded in Security (3.90), indicating that stakeholders and IT experts found the system to be highly secure in protecting institutional data and user information. Functional Suitability (3.73) and Reliability (3.73) also garnered strong ratings, demonstrating that the system effectively meets its intended purposes while performing consistently under expected conditions.

Attributes such as Interaction Capability (3.69), Maintainability (3.68), Flexibility (3.68), and Safety (3.66) were rated "Very Capable" or "Very Safe," suggesting that the system's user interaction design, ease of maintenance, adaptability to change, and risk mitigation features were well-received. Meanwhile, Performance Efficiency (3.60) and Compatibility (3.55), while still rated positively, reflected areas where optimization could further enhance system responsiveness and integration with other platforms.

Table 2. – Evaluation Summary Results based on ISO/IEC 25010

SOFTWARE QUALITY CHARACTERISTICS	WEIGHTED MEAN	VERBAL DESCRIPTION
Functional Suitability	3.70	Highly Functional
Performance Efficiency	3.60	Highly Efficient
Compatibility	3.55	Highly Compatible
Interaction Capability	3.69	Highly Capable
Reliability	3.73	Highly Reliable
Security	3.90	Highly Secure
Maintainability	3.68	Highly Maintainable
Flexibility	3.68	Highly Flexible
Safety	3.66	Highly Safe

Compared to related studies on decision support and institutional management systems, such as those by Teng et al. (2022), Namoco et al. (2021), and Fajardo et al. (2024), the ASK-COT system demonstrates notable strengths in security and reliability, aligning with best practices in higher education technology solutions.

THE QUEST Journal of Multidisciplinary Research and Development
ISSN 1908-3211 (Online) | ISSN 1908-322X (Print)
P-ISSN: 1908-322X and E-ISSN: 1908-3211
Vol.4 No.2 (2)
Received:08-08 / Revised: 09-09/ Accepted: 12-12-2025 https://neust.journalintellect.com/quest

These qualities ensure the stability, protection, and integrity of institutional data while maintaining ease of use for end-users. The incorporation of compliance tracking features and evaluation based on ISO/IEC 25010 further distinguishes ASK-COT from existing systems, positioning it as a robust and strategically aligned platform for institutional planning and decision-making, with opportunities for enhancement in performance efficiency and cross-platform compatibility.

4. Conclusions

The development and implementation of ASK-COT: An Executive Decision Support System for the Planning Unit of Aurora State College of Technology demonstrated its significant contribution to institutional modernization. Through a structured and phased approach—covering needs assessment, design, development, and evaluation—the system successfully addressed the core challenges of manual report submission, fragmented data processing, and delayed decision-making.

Evaluation results based on the ISO/IEC 25010 model confirmed ASK-COT's robustness across all nine quality characteristics, with particularly high ratings in security, reliability, and functional suitability. These findings establish that ASK-COT is not only technically sound but also aligned with international software quality standards.

Post-evaluations by IT experts and stakeholders further validated the system's technical stability, usability, and scalability, confirming its potential for long-term integration and future enhancement. The strong endorsement from executives, deans, and planning personnel highlights ASK-COT's acceptability and operational viability, making it a reliable tool for institutional reporting and strategic planning.

ASK-COT has proven to be an effective digital solution that enhances accuracy, transparency, and accountability in ASCOT's operations. Its successful deployment positions it as a model information system that can guide similar academic institutions in their digital transformation and governance initiatives.

THE QUEST Journal of Multidisciplinary Research and Development
ISSN 1908-3211 (Online) | ISSN 1908-322X (Print)
P-ISSN: 1908-322X and E-ISSN: 1908-3211
Vol.4 No.2 (2)
Received:08-08 / Revised: 09-09/ Accepted: 12-12-2025 https://neust.journalintellect.com/quest

Acknowledgements

First and foremost, the researcher offers his highest praise and deepest gratitude to Jesus Christ, our Lord and Savior, whose boundless grace, divine wisdom, and unwavering strength sustained him throughout every step of this academic journey. His guidance and presence were the source of inspiration, perseverance, and peace in the face of every challenge.

The researcher also wishes to extend his deepest appreciation to the following individuals whose invaluable support and contributions were instrumental in the successful completion of this study:

To Dr. Allen Paul L. Esteban, the researcher's adviser, who has been a true blessing throughout this academic journey. His steadfast guidance, insightful advice, and unwavering dedication provided not only academic direction but also personal encouragement that deeply inspired the researcher to persevere and grow;

To Dr. Alvin P. Dela Cruz, the researcher's statistician, for his exceptional expertise and meticulous analysis, which ensured the accuracy, validity, and reliability of the study's statistical data—significantly enhancing its scientific rigor;

To Dr. Jonathan L. Mañas, the research editor, for his patience, attention to detail, and thorough revisions, which refined the manuscript's grammar, clarity, and coherence, thereby elevating its overall readability;

To Dr. Jocelyn B. Cruz, Dean of the Graduate School, for her constant encouragement and unwavering belief in the researcher's capabilities;

To Dr. Rolaida L. Sonza, Dr. Jet C. Aquino, and Dr. Maria Isidra P. Marcos, esteemed members of the panel of evaluators, for their invaluable insights, constructive criticisms, and motivating feedback—not only during the thesis evaluation process but throughout the researcher's entire MSIT journey. Their expertise and encouragement greatly contributed to the refinement of this study and to the researcher's academic growth;

To the researcher's family and friends, for their unconditional love, moral support, and financial assistance. Their steadfast encouragement and sacrifices provided the strength and inspiration needed to complete this academic journey.

P-ISSN: 1908-322X and E-ISSN: 1908-3211
Vol.4 No.2 (2)
Received:08-08 / Revised: 09-09/ Accepted: 12-12-2025 https://neust.journalintellect.com/quest

References

Arroyo, R.C., et al., n.d. A data-driven approach in predicting scholarship grants of a local government unit in the Philippines using machine learning. International Journal of Engineering Trends and Technology. Available at: https://ijettjournal.org/archive/ijett-v72i6p108 [Accessed 18 Aug. 2025].

Condez, M.C.B., 2024. Technical efficiency of State Universities and Colleges (SUCs) in the Philippines: A Data Envelopment Analysis (DEA) approach. Davao Research Journal, 15(2), pp.98-115. Esquivel, J.A. and Esquivel, J.A., 2021. A machine learning based DSS in predicting undergraduate freshmen enrolment in a Philippine university. International Journal of Computer Trends and Technology, 69(5), pp.50-54. https://doi.org/10.14445/22312803/ijctt-v69i5p107

Flores, J., 2023. Navigating complex decision-making: A study of Filipino education deans' perceptions on strategic decision-making. International Journal of Research Publications, 128(1). https://doi.org/10.47119/ijrp1001281720235179

Mandap, M.C. and Almario, O.P., 2024. Data-informed leadership: Assessing the impact on educational management practices and decision-making in La Consolacion University Philippines. Globus: An International Journal of Management & IT, 15(2), pp.12-22. https://doi.org/10.46360/globus.mgt.120241002

Namoco, R.A., Abecia, A.L. and Pailagao, R.O., 2021. A decision support system for optimizing nutrient in daily lunch intake among college students in Cagayan de Oro City, Philippines using linear programming. Indian Journal of Science and Technology, 14(45), pp.3304-3317. https://doi.org/10.17485/ijst/v14i45.1457

Sutton, R.T., Pincock, D., Baumgart, D.C., Sadowski, D.C., Fedorak, R.N. and Kroeker, K.I., 2020. An overview of clinical decision support systems: Benefits, risks, and strategies for success. npj Digital Medicine, 3(1). https://doi.org/10.1038/s41746-020-0221-y

Teng, Y., Zhang, J. and Sun, T., 2022. Data-driven decision-making model based on artificial intelligence in higher education system of colleges and universities. Expert Systems, 40(4). https://doi.org/10.1111/exsy.12820