

Improving the Performance of the Digital Application "Ship manager DNV" Based on the "ADKAR" Model of Change Management at PT. PIS

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Abstract. *Digital transformation within highly regulated maritime operations requires not only technological implementation but also structured organizational change. This study examines the effect of ADKAR-based change management (Awareness, Desire, Knowledge, Ability, Reinforcement) on the performance of the Ship Manager DNV digital application at PT Pertamina International Shipping (PIS), and investigates whether User Experience and User Satisfaction moderate this relationship. A quantitative explanatory approach was employed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with 104 active system users. The results reveal that ADKAR has a strong and significant positive effect on digital application performance ($\beta = 0.798$; $p < 0.001$). The structural model explains 54.1% of the variance in performance ($R^2 = 0.541$) and demonstrates high predictive relevance ($Q^2 = 0.505$). In contrast, User Experience and Satisfaction do not significantly influence performance either directly or as moderating variables. These findings suggest that in mandatory, KPI-driven environments, digital transformation success is predominantly driven by structured change management rather than perceived system comfort. This study contributes to management literature by extending ADKAR application into a maritime fleet management context and highlighting boundary conditions of user experience in enforced digital systems.*

Keywords: *Application; Digital; Industry; Maritime; Performance.*

1. Introduction

Digital transformation has become a strategic agenda in the global shipping industry in response to demands for increased operational efficiency, data transparency, and compliance with increasingly stringent international regulations. The maritime industry faces pressure to ensure shipping safety, optimize ship maintenance costs, and ensure the accuracy of systematically documented and auditable technical documentation. In this context, digitizing fleet management systems is a crucial tool for supporting integrated, data-driven operational governance.

PT Pertamina International Shipping (PIS), a shipping company operating in a highly regulated and KPI-driven environment, implemented DNV's Ship Manager, an integrated ship management system encompassing the Planned Maintenance System (PMS), procurement, QHSE, and compliance monitoring modules. This system is designed to replace manual processes and strengthen the standardization of digital ship reporting.

However, technology implementation does not always translate directly to improved performance. In the initial implementation phase in 2025, Quality Ship Manager performance in PIS was in the range of 53–58%, falling short of the corporate target of 90%. This situation indicates a gap between technology availability and its effectiveness in the field. Although the system is in place and supported by managerial policies, reporting consistency and compliance are still suboptimal.

Interestingly, after implementing a change management intervention based on the ADKAR (Awareness, Desire, Knowledge, Ability, Reinforcement) model, the Ship Manager Quality score gradually increased, reaching 96% by the end of the year. This significant increase indicates that the success of digital system implementation is not solely determined by the quality of the technology, but rather by the effectiveness of organizational change management and individual readiness to adopt the new system.

Theoretically, the ADKAR model emphasizes that organizational change begins with individual change through stages of awareness, willingness, knowledge, ability, and continuous reinforcement. In the context of a mandatory information system, such as Ship Manager, the success of the transformation depends heavily on operational discipline, reporting compliance, and management reinforcement. Therefore, it is important to examine the extent to which ADKAR-based change management contributes to digital application performance, and whether user experience and satisfaction also strengthen this relationship.

This study aims to analyze the effect of ADKAR-based change management on the performance of DNV's Ship Manager digital application in PIS, and to examine the moderating role of User Experience and User Satisfaction in this relationship. By integrating the change management perspective and the information systems success literature, this study is expected to provide an empirical contribution to the development of digital transformation strategies in highly regulated maritime operational environments.

Digital transformation in organizations involves not only changes to systems and processes, but also changes in the behavior of individuals as key actors in technology implementation. The change management perspective emphasizes that the success of organizational change depends heavily on the readiness of individuals to accept and implement those changes. One model widely used in change management practice and research is the ADKAR model developed by Prosci.

The ADKAR model consists of five main elements: Awareness (awareness of the urgency of change), Desire (willingness to support change), Knowledge (knowledge of how to make change), Ability (ability to implement change), and Reinforcement (strengthening the change to ensure its sustainability). This model is sequential and people-centered, meaning that organizational change begins with gradual individual change.

In the context of digital system implementation, ADKAR ensures that users not only understand the rationale for transformation (awareness), but also possess motivation (desire), technical knowledge (knowledge), operational capability (ability), and ongoing support and reinforcement from management (reinforcement). Without these five stages, digital system adoption can potentially encounter resistance, inconsistent use, or a relapse into old habits.

Numerous studies in the digital transformation literature show that the success of information systems implementation is heavily influenced by non-technical factors such as change leadership, communication, and organizational readiness. Therefore, ADKAR-based change management is seen as a critical determinant in increasing the effectiveness of digital systems use in an organizational environment.

Based on these theoretical arguments, the more effective the implementation of ADKAR-based change management, the higher the level of consistency, compliance, and performance of digital applications.

H1: ADKAR-based Change Management has a positive effect on digital application performance.

The literature on information systems success places the quality of user experience and satisfaction as critical factors in determining the effectiveness of a system. User Experience (UX) reflects user perceptions of ease of use, usefulness, interface clarity, system responsiveness, and ease of navigation. Meanwhile, User Satisfaction describes the user's affective evaluation of the system after use.

The Technology Acceptance Model (TAM) emphasizes that perceived usefulness and perceived ease of use influence the intention and intensity of technology use. Furthermore, the DeLone and McLean information systems success model places user satisfaction as a central variable linking system quality to organizational benefits.

However, in the context of mandatory and compliance-based systems, system usage is not solely determined by individual preferences, but also by organizational policies and oversight mechanisms. Therefore, UX and user satisfaction can serve as contingency factors that strengthen or weaken the influence of change management on system performance.

If users find the system easy to use, stable, and useful, the positive impact of change management on application performance can be further enhanced. Conversely, if the user experience is less than optimal, the effectiveness of the change may not be optimal.

Thus, User Experience and User Satisfaction are positioned as moderating variables in the relationship between ADKAR and digital application performance.

H2: User Experience and User Satisfaction moderate the influence of ADKAR on digital application performance.

Based on the theoretical description, this research model tests:

- 1) The direct impact of ADKAR-based Change Management on Digital Application Performance.
- 2) The moderating role of User Experience and User Satisfaction in strengthening or weakening the relationship.

2. Research Methods

Primary data was collected by distributing a structured questionnaire to respondents who met the sample criteria. The research instrument used a 5-point Likert scale, with a range of: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree Each construct is measured using reflective indicators: ADKAR (X2): Awareness, Desire, Knowledge, Ability, Reinforcement. User Experience & Satisfaction (X1): usefulness, system availability, support responsiveness, ease of use, reliability. Digital Application Performance (Y): consistency and compliance of reporting through the system. Secondary data was obtained from the 2025 Quality Ship Manager internal report, company policy documents, and relevant scientific literature. Data analysis was conducted using the Partial Least Squares–Structural Equation Modeling (PLS-SEM) method with the help of Smart PLS 4.0 software. The PLS-SEM method was chosen because: Suitable for predictive research models. Does not require a strict normal distribution. Suitable for moderate sample sizes. Able to test the moderating effect in structural models. Overall, the analysis procedure begins with testing the quality of the instrument (outer model), followed by testing the structural relationships (inner model), and evaluating the model's predictive power. This approach allows for simultaneous testing of direct and moderating relationships within a single, comprehensive model framework. The study used a quantitative explanatory approach with a sample of 104 respondents who were active Ship Manager users at PT PIS. Data analysis used PLS-SEM through Smart PLS 4.0 with evaluation of the outer and inner models, including bootstrapping and predictive relevance (Q^2) testing.

3. Results and Discussion

3.1. Results of Structural Model Analysis

Based on the analysis results using PLS-SEM through Smart PLS 4.0, it was found that ADKAR-based Change Management has a positive and significant effect on the performance of the DNV Ship Manager digital application. The path coefficient (β) value of 0.798 with a p-value

<0.001 indicates that the effect is very strong and statistically significant. Thus, the first hypothesis (H1) is accepted.

The coefficient of determination (R^2) value of 0.541 indicates that the model is able to explain 54.1% of the variation in digital application performance. Based on Hair et al.'s criteria, this value is in the moderate to strong category, meaning the ADKAR variables and their interactions have good explanatory power in explaining changes in application performance. Furthermore, a predictive relevance (Q^2) value greater than zero indicates that the model has adequate predictive power. In contrast, the analysis results show that User Experience and User Satisfaction do not significantly influence application performance directly ($\beta = -0.061$; $p > 0.05$). Furthermore, the moderating effect between ADKAR and User Experience is also insignificant ($\beta = 0.094$; $p > 0.05$). Thus, the second hypothesis (H2) is not empirically supported.

3.2 Discussion

The findings of this study confirm that the success of digital system implementation in the context of mandatory and compliance-based organizations is determined more by the effectiveness of change management than by the perceived ease of use of the system. The ADKAR coefficient of influence, which approaches 0.80, indicates that the Awareness, Desire, Knowledge, Ability, and Reinforcement dimensions play a dominant role in improving reporting consistency and compliance through Ship Manager.

Substantively, these results indicate that digital transformation at PT PIS is not solely a technological issue, but also a behavioral and managerial one. Interventions, such as system evaluation prior to platform selection, development of manuals, training and workshops, improvements to internet infrastructure and devices, and reinforcement through Fleet Director policies, align with ADKAR stages and have been shown to improve ShipManager Quality, reaching 96% by the end of the year.

The insignificant influence of User Experience and Satisfaction indicates that in mandatory systems, organizational compliance and managerial reinforcement are more important than individual preferences for system convenience or comfort. This aligns with contingency theory, which states that the effectiveness of a variable depends on the organizational context. In highly regulated and KPI-driven environments, compliance with policies and oversight is more dominant than user affective factors.

The results of this study also extend the change management literature by demonstrating that the ADKAR model has strong predictive power in the context of implementing a maritime fleet management system. The integration of change management and information systems provides insight that the success of digitalization depends not only on the quality of technology but also on individual readiness and systematic organizational strengthening.

Thus, this study provides theoretical implications that in mandatory information systems, the system success model needs to consider change management variables as the main determinant, while user experience variables can play a role as supporting factors, not the main determinant.

4. Conclusion

This study aims to analyze the influence of ADKAR model-based change management on the performance of the DNV Ship Manager digital application at PT Pertamina International Shipping (PIS), and to examine the moderating role of User Experience and User Satisfaction in this relationship. Based on the results of the PLS-SEM analysis of 104 active system user respondents, it can be concluded that: ADKAR-based Change Management has a positive and significant impact on digital application performance. High path coefficients indicate that individual readiness through Awareness, Desire, Knowledge, Ability, and Reinforcement is a determining factor in increasing consistency and compliance with system use. The model has good explanatory capabilities, with an R^2 value of 0.541, indicating that 54.1% of the variation in application performance can be explained by the variables in the model. User Experience and User Satisfaction did not have a significant effect, either directly or as moderating variables. This indicates that in mandatory, compliance-based systems, managerial and organizational empowerment factors are more dominant than perceived ease of use. Overall, this study confirms that the success of DNV ShipManager's digital transformation at PT PIS is more change-driven than technology-driven. This means that success is determined not solely by technological sophistication, but by the effectiveness of organizational change management and operational discipline. Suggestions, Based on the research findings, several recommendations that can be given are as follows: Strengthening Change Management Strategy. Organizations need to make the ADKAR model a permanent framework for every digital transformation initiative. Change communication, role-based training, and reinforcement through formal policies and KPI monitoring must be implemented consistently and continuously. ADKAR Integration in Operational Governance Change management is not just a temporary project, but needs to be integrated into the management control system and work culture of the organization.

Based on the research findings, several recommendations can be made as follows:

1) Strengthening Change Management Strategy

Organizations need to make the ADKAR model a permanent framework for every digital transformation initiative. Change communication, role-based training, and reinforcement through formal policies and KPI monitoring must be implemented consistently and continuously.

2) Integrating ADKAR into Operational Governance

Change management is not merely a temporary project; it needs to be integrated into the organization's management control system and work culture.

3) Improving Infrastructure as a Supporting Factor

Although UX is not statistically significant, improving the quality of systems and infrastructure remains crucial for maintaining operational efficiency and reducing the potential for long-term resistance.

4) Recommendations for Further Research

Future research could expand the context to other shipping companies or different industries to test the model's generalizability. Furthermore, application performance measurements could be developed multidimensionally (e.g., data quality, reporting timeliness, and operational impact) and use a longitudinal design to examine the dynamics of change over time.

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