BACHELOR'S THESIS IN COMPUTER SCIENCE AND INDUSTRIAL ECONOMICS

UNDERGRADUATE LEVEL 15 CREDITS

A Comparative Evaluation of Open-Source Digital Asset Management Systems

Exploring Organizational and Marketing Criteria for Process and Marketing Innovation in SMEs

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1 Introduction

1.1 Research Question

The research question investigated in this pre-study is:

> *"To what extent does DAM adoption contribute to improved operational efficiency and strategic positioning in a premium manufacturing company?"*

1.2 Connection to the Technical Project

The technical aspect of this study examines the adoption of an open-source DAM system versus the development of a tailored solution, with a focus on role-based access control, security, logging, and usability.

However, technological advancements alone do not guarantee successful integration. To complement this, the business perspective assesses the organizational and strategic impact after selecting the preferred DAM system. Specifically:

- **Process Impact:** Assessing whether the DAM system has enhanced workflow efficiency, minimized errors, and reduced redundant tasks.
- **Organizational Adoption:** Evaluating the ease of employee adaptation, the necessity of training, and any role adjustments required for successful implementation.
- **Strategic Impact:** Determining whether the DAM system strengthens brand consistency, improves customer engagement, and supports scalability as the company expands.

1.3 Societal Impact

Digital transformation has a significant impact on small and medium-sized enterprises (SMEs). SMEs account for approximately 60% of total turnover and value-added contributions in Sweden's private sector, employing around 65% of the workforce (Tillväxtverket, 2021).

The adoption of DAM systems is an integral part of this transformation, improving operational efficiency and reducing manual work, which contributes to broader economic growth. A cost-benefit analysis of 319 SMEs found that digital transformation enhances organizational resilience, reduces operational costs, and improves long-term scalability (Teng et al., 2022).

2 Theoretical Framework and Previous Studies

This section builds upon existing literature and theoretical frameworks to analyze how DAM adoption influences strategic decision-making, cost structures, and competitive positioning in SMEs. A particular emphasis is placed on the interplay between technological capabilities, organizational governance, and leadership dynamics, as these factors shape the effectiveness of DAM systems in practice.

2.1 The Resource-Based View

The Resource-Based View (RBV) suggests that organizations derive competitive advantage by leveraging valuable, rare, inimitable, and non-substitutable (VRIN) resources Barney (1991). DAM systems fulfill these criteria by providing centralized governance, metadata standardization, and automation, transforming digital assets into strategic resources Chumphong et al. (2020).

Empirical findings support this perspec-

tive. Chumphong et al. (2020) report that SMEs achieving full DAM integration demonstrate 23% higher operational resilience during market disruptions compared to those with only partial implementation. This aligns with RBV's emphasis on resource orchestration and its role in maintaining competitiveness.

Nevertheless, some scholars argue that resource possession alone does not guarantee successful digital transformation. Civelek et al. (2023) found no significant link between dynamic capabilities—a key aspect of RBV that involves adapting, integrating, and reconfiguring resources—and successful digital transformation among Czech manufacturing SMEs. Their findings suggest that merely possessing dynamic capabilities is insufficient for digital transformation unless supported by complementary factors such as digital literacy and IT infrastructure maturity.

2.2 Simons' Levers of Control

Simons (1995) Levers of Control (LOC) framework is a central model for understanding how organizations balance control and innovation through management control systems (MCS). There are diagnostic control systems, which are used to monitor and ensure that operations align with set objectives, and interactive control systems, which facilitate strategic discussions and adaptation to changing market conditions. In a digital context, these control mechanisms become crucial for how organizations effectively implement systems.

2.2.1 Diagnostic Control Systems

By implementing DAM, organizations can systematically monitor resource usage and efficiency, reducing redundancies and improving workflows. Previous research indicates that such systems can reduce unnecessary tasks by up to 34% through automated version management and asset tracking Mladenova (2024).

Wernerfelt (1984) lays the foundation for resource-based theory, suggesting that firms should focus on acquiring and leveraging valuable resources rather than just competing on products or market positioning. The idea that DAM enhance governance and long-term decision-making can be linked to his argument that a firm's internal resources dictate its competitive position. Barney (1991) builds upon this idea by highlighting the importance of VRIN resources that are difficult to imitate or substitute. DAM can play a key role in creating such competitive advantages by protecting and optimizing an organization's digital content management. By gathering data on usage patterns and performance, DAM can also contribute to a more data-driven governance approach, strengthening long-term strategic decision-making Wernerfelt (1984).

2.2.2 Interactive Control Systems

Technological advancements necessitate a continuous reassessment of strategies and work processes. DAM can serve as an interactive control tool by integrating digital assets into strategic processes and facilitating collaboration across organizational boundaries. Teece et al. (1997) argue that companies require dynamic capabilities to adapt to rapid environmental changes, and DAM systems can serve as such a capability by facilitating knowledge sharing and cross-functional collaboration. Mladenova (2024) found that companies implementing DAM experienced a 19% faster time-to-market for new products, suggesting that it contributes to increased organizational flexibility and innovation capabilities.

However, for DAM to function as interactive control, management must actively engage in its use and foster a culture where digital tools are seen as integral to the company's strategic development. Simons (1995) emphasizes that control systems must evolve

alongside technological adoption and that management plays a central role in ensuring that new technology is integrated in a way that supports both control and innovation. Eisenhardt and Martin (2000) furhter stress that technological resources alone do not provide a competitive advantage unless combined with organizational capabilities that enable adaptation and change

2.3 Leadership dynamics

This review extends prior research by addressing the underexplored role of leadership styles in mediating DAM success. Civelek et al. (2023) emphasizes the importance of joint ventures with IT firms in SME digital transformation, but does not explicitly examine how leadership styles influence DAM adoption. This gap suggests that existing frameworks may not fully account for the managerial processes that enable or hinder DAM integration within SMEs.

2.4 Innovation Theory

This study extends the discussion on digital transformation in SMEs by integrating the innovation classification outlined in the Oslo Manual. Process innovation refers to the introduction of significantly improved production or delivery methods, including advancements in techniques, software, and organizational workflows OECD and Eurostat (2018).

3 Research Methodology

Undersöka om förändringarna är ”nyttiga” och ”hållbara” ur flera perspektiv: 1. Intern process (är arbetssättet väsentligt förbättrat och mer effektivt?) 2. Extern marknad (leder det till nya eller förbättrade sätt att nå och engagera kunder?) 3. Hållbarhet och tillväxt (kan lösningen skalas upp till nya marknader eller segment?)

3.1 Literature Review

A systematic literature review will be conducted to identify key factors influencing DAM adoption in SMEs. Topics include:

- Digital transformation in SMEs
- Organizational change management
- Process and marketing innovation strategies

3.2 Workshops and Interviews

Workshops will be held with industry stakeholders, including designers, project managers, and business executives, to assess their needs and expectations. Interviews will be conducted to explore:

- Existing workflow challenges
- Perceived value of DAM systems
- Business considerations influencing adoption

3.3 Benchmarking

A comparative analysis of DAM adoption in similar industries will be conducted, identifying best practices and potential pitfalls.

3.4 Economic and Organizational Impact Analysis

The study will evaluate:

- **Quantitative factors:** Cost savings, efficiency improvements, and return on investment (ROI).
- **Qualitative factors:** Changes in collaboration dynamics, decision-making processes, and marketing strategies.

4 Discussion

4.1 Suitability of the Theoretical Framework

The Oslo Manual framework provides a structured way to classify and analyze innovation. However, its broad definitions may need refinement when applied to specific SME contexts.

4.2 Expected Findings

The study anticipates that the primary challenges in DAM adoption will be:

- Resistance to change within SMEs.
- Need for a clear return on investment to justify adoption.
- Importance of a user-friendly design to ensure full adoption and utilization.

These findings will be validated through empirical data collection.

5 Conclusion

The **industrial economics perspective** enriches the **technical development** of DAM systems by identifying **critical business considerations**. This pre-study establishes a foundation for further research into the **organizational and strategic factors** necessary for successful DAM adoption in **SMEs operating within premium manufacturing**.

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