



MASTER DEGREE RESEARCH PROPOSAL

Project Management

The Impact of Saudi Arabia's Support through the Saudi Industrial Development Fund (SIDF) Initiatives on Factory Development and Digital Transformation: Enhancing Local and Global Competitiveness while Reducing Dependence on Imports in the Kingdom of Saudi Arabia

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Abstract.

The industrial landscape of Saudi Arabia is undergoing a significant transformation, driven in part by the Saudi Industrial Development Fund's (SIDF) initiatives. But what exactly is the impact of SIDF's support on factory development and digital transformation in the Kingdom of Saudi Arabia. This research proposal aims to explore this question, with a focus on how SIDF's financing, advisory services, and enablement programs are influencing industrial modernization, operational capability, and technological adoption. We're talking about a country that's trying to reduce its dependence on imports and become more competitive on the global stage. The Saudi Arabia Vision 2030 and the National Industrial Strategy are all about economic diversification, advanced manufacturing, and export growth. But despite the emphasis on SIDF's role in industrial development, there's surprisingly little empirical evidence on how its initiatives is affecting factory-level transformation outcomes. This study seeks to fill that gap, using a quantitative research design to collect survey data from Saudi manufacturing firms that have benefited from SIDF support. We'll be using statistical analysis to test the relationships between SIDF support, factory development, digital transformation, competitiveness, and import substitution. The goal is to develop a structured, evidence-based model that can inform policymakers, SIDF decision-makers, and factory leaders, as well as researchers interested in industrial transformation and project management in Saudi Arabia. By exploring the impact of SIDF's initiatives, we hope to gain a deeper understanding of what works and what doesn't, and how Saudi Arabia can continue to drive industrial growth and competitiveness in the years to come. This research has the potential to make a real difference, providing insights that can help shape the country's industrial strategy and support the development of a more diversified and competitive economy. Keywords: Saudi Industrial Development Fund, SIDF, factory development, digital transformation, Industry 4.0, competitiveness, import substitution, Saudi Vision 2030, project management.

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1. Research Title

The Impact of Saudi Arabia's Support through the Saudi Industrial Development Fund (SIDF) Initiatives on Factory Development and Digital Transformation: Enhancing Local and Global Competitiveness while Reducing Dependence on Imports in the Kingdom of Saudi Arabia.

The title reflects the core relationship examined in this study. It connects national institutional support, represented by SIDF initiatives, with factory-level outcomes, represented by development, digital transformation, competitiveness, and import substitution. The title also reflects the strategic context of Saudi Vision 2030, which seeks to build a diversified, competitive, and knowledge-based economy supported by strong industrial capabilities.

2. Introduction

Saudi Arabia is undergoing a major economic and industrial transformation through Saudi Vision 2030. One of the central goals of this transformation is to diversify the economy, expand non-oil sectors, increase local content, strengthen national industries, and improve the Kingdom's competitiveness in regional and global markets. The industrial sector is a major pillar of this transformation because it contributes to job creation, technological development, supply chain resilience, export growth, and the localization of strategic products.

Within this national agenda, the Saudi Industrial Development Fund (SIDF) plays a critical role in enabling industrial growth. SIDF has historically provided medium- and long-term financing to industrial projects, and its modern role has expanded to include advisory, market intelligence, specialized programs, and support for industrial excellence. SIDF's support helps manufacturing firms obtain the financial and technical capacity required to build factories, expand production lines, modernize equipment, improve operational efficiency, and adopt advanced technologies.

Digital transformation has become a key requirement for factory development. In the manufacturing context, digital transformation includes the adoption of automation, integrated production systems, data analytics, enterprise resource planning, predictive maintenance, industrial internet of things, quality traceability, smart warehousing, cybersecurity, and digital performance dashboards. These technologies can improve productivity, reduce downtime, increase quality, enhance planning accuracy, and improve responsiveness to customer and market demands.

However, digital transformation is not only a technology issue. It is also a project management, organizational capability, and strategic alignment issue. Factories need skilled people, clear

investment priorities, strong governance, change management, reliable implementation plans, and performance measurement systems. Without these elements, technology investments may fail to generate sustainable business value. Therefore, SIDF support may influence transformation not only by providing finance, but also by encouraging disciplined project planning, feasibility analysis, capability development, and long-term industrial sustainability.

The need to reduce dependence on imports has gained additional importance as global supply chains have become more exposed to disruption, geopolitical risk, price volatility, and logistics constraints. For Saudi Arabia, import substitution does not mean isolation from global trade; rather, it means building domestic manufacturing capacity in sectors where local production can create value, improve resilience, and support national competitiveness. In this context, factory development and digital transformation may strengthen the ability of Saudi manufacturers to produce goods that meet local demand and compete internationally.

Although SIDF's role is widely recognized in national policy and industrial development discussions, there is limited empirical research that measures how SIDF initiatives affect factory-level development, digital maturity, competitiveness, and import-reduction outcomes. Many existing sources describe programs, strategies, and achievements at a national or institutional level, but fewer studies examine the perceptions and performance of beneficiary firms. This proposal therefore aims to develop and test an empirical model that links SIDF support to industrial transformation outcomes in Saudi manufacturing firms.

3. Concept and Objectives of the Research Proposal

3.1 Concept of the Research Proposal

A research proposal is a structured academic plan that explains what the researcher intends to study, why the topic is important, how the study will be conducted, and what contribution the research is expected to make. It provides the foundation for the master's research project by defining the problem, reviewing the relevant literature, identifying research questions and hypotheses, selecting a suitable methodology, and setting the boundaries of the study.

In this study, the concept of the proposal is based on examining SIDF as an enabling institution within Saudi Arabia's industrial development ecosystem. The proposal treats SIDF support as a strategic input that may influence factory development and digital transformation. These two

outcomes are expected to strengthen competitiveness, which may subsequently contribute to reducing dependence on imports. The study therefore combines industrial policy, digital transformation, competitiveness theory, and project management perspectives.

3.2 Research Objectives

- To examine the extent to which SIDF support influences factory development among Saudi manufacturing firms.
- To evaluate the relationship between SIDF support and the adoption of digital transformation practices in factories.
- To assess how digital transformation contributes to local and global competitiveness in Saudi manufacturing firms.
- To investigate whether improved competitiveness contributes to reducing dependence on imported products and inputs.
- To develop a conceptual and empirical framework linking SIDF initiatives, factory development, digital transformation, competitiveness, and import substitution.
- To provide practical recommendations for policymakers, SIDF decision makers, factory managers, and project managers involved in industrial transformation projects.

4. The Stages of the Research Process

The proposed research will follow a logical sequence of academic and practical stages. These stages ensure that the study is systematic, credible, and aligned with master's-level research standards.

1. Problem identification: Define the research problem related to the limited empirical evidence on the impact of SIDF initiatives on factory transformation outcomes.
2. Preliminary literature review: Review official reports, Saudi Vision 2030 documents, SIDF publications, Ministry of Industry materials, and peer-reviewed studies on digital transformation, competitiveness, and industrial development.
3. Conceptual framework development: Identify the main variables and propose relationships among SIDF support, factory development, digital transformation, competitiveness, and import substitution.
4. Research questions and hypotheses: Formulate clear research questions and testable hypotheses based on theory and literature.

5. Methodology design: Select the research approach, population, sampling method, data collection instrument, and statistical analysis technique.
6. Instrument development: Design a structured questionnaire using validated constructs where possible and adapt items to the Saudi industrial context.
7. Data collection: Collect survey responses from managers, engineers, project leaders, operations leaders, and decision makers in SIDF-supported manufacturing firms.
8. Data analysis: Analyze the data using descriptive statistics, reliability tests, validity tests, correlation analysis, regression analysis, and/or PLS-SEM.
9. Discussion: Interpret the findings in relation to the research hypotheses, literature, and Saudi industrial policy context.
10. Conclusion and recommendations: Present conclusions, contributions, limitations, and recommendations for policy, practice, and future research.

5. Research Problem

Saudi Arabia has invested significantly in industrial development through Vision 2030 initiatives, the National Industrial Strategy, SIDF financing, local content programs, and industrial ecosystem reforms. These initiatives aim to improve factory capacity, encourage digital transformation, increase competitiveness, and reduce dependence on imported products. Despite this strategic importance, there is still limited empirical evidence explaining how SIDF initiatives influence factory-level outcomes.

The research problem can be stated as follows: there is insufficient empirical understanding of the impact of SIDF support on factory development and digital transformation, and how these outcomes contribute to competitiveness and reduced dependence on imports in Saudi Arabia.

This gap is important because public support programs must be assessed not only by the amount of financing provided or the number of projects supported, but also by their effect on long-term industrial capability. A factory may receive financing, but the true value of that support depends on whether it improves production capacity, operational reliability, technology adoption, quality systems, workforce skills, market access, and competitiveness. Therefore, this study seeks to measure the perceived and practical impact of SIDF support on these outcomes.

5.1 Problem Statement

Although SIDF initiatives are designed to support Saudi industrial development, there is a lack of detailed empirical research that examines their contribution to factory development, digital transformation, competitiveness, and import substitution from the perspective of beneficiary manufacturing firms. This study addresses that gap by developing and testing a model that links SIDF support to measurable industrial transformation outcomes.

6. The Importance of the Research

The importance of this research can be viewed from academic, policy, industrial, and project management perspectives. Academically, the study contributes to the literature on industrial development, public development finance, digital transformation, and competitiveness in an emerging economy context. Most digital transformation research has focused on large multinational firms or developed economies, while fewer studies examine how national development funds support digital transformation in manufacturing firms.

From a policy perspective, the research can provide evidence that helps evaluate the effectiveness of SIDF initiatives and their alignment with Vision 2030 objectives. Policymakers need reliable information about which types of support are most strongly associated with factory modernization and competitiveness. Such evidence can help refine future programs, improve targeting, strengthen advisory services, and support national goals related to local content and import substitution.

From an industrial perspective, the research can help factory owners and managers understand the capabilities required to benefit from SIDF support. It may identify the importance of planning, project execution, digital readiness, workforce development, and performance measurement. These insights can support better decision making when factories apply for financing or implement modernization projects.

From a project management perspective, the research is highly relevant because factory development and digital transformation are implemented through projects. These projects require scope definition, feasibility studies, cost estimation, scheduling, risk management, stakeholder engagement, procurement, commissioning, and benefits realization. The study can therefore highlight how project management practices influence the success of SIDF-supported industrial transformation initiatives.

7. Research Questions and Hypotheses

7.1 Research Questions

11. To what extent does SIDF support influence factory development in Saudi manufacturing firms?
12. How does SIDF support influence digital transformation in Saudi factories?
13. What is the relationship between digital transformation and local/global competitiveness?
14. How does improved competitiveness contribute to reducing dependence on imports in Saudi Arabia?
15. What recommendations can enhance the effectiveness of SIDF initiatives in supporting factory development and digital transformation?

7.2 Research Hypotheses

- H1: SIDF support has a positive and statistically significant influence on factory development.
- H2: SIDF support has a positive and statistically significant influence on digital transformation.
- H3: Digital transformation has a positive and statistically significant influence on factory competitiveness.
- H4: Factory competitiveness has a positive and statistically significant influence on reducing dependence on imports.
- H5: Factory development has a positive and statistically significant influence on factory competitiveness.
- H6: Digital transformation mediates the relationship between SIDF support and factory competitiveness.

8. Literature Review.

8.1 Saudi Vision 2030 and Industrial Diversification.

Saudi Vision 2030 provides the strategic foundation for transforming the Kingdom into a diversified and competitive economy. Industrial diversification is a key part of this vision because it supports non-oil gross domestic product growth, employment, technology transfer, export development, and local production capability. The National Industrial Strategy expands this direction by emphasizing advanced manufacturing, strategic sectors, supply chain localization, and global competitiveness. Making a country's industry stronger is not just about building more factories. It's about creating factories that can compete with others, make things efficiently, and

meet high standards. They also need to use the latest technology, listen to what the market needs, and work well with other companies locally and globally. So, a country's plan for its industry needs to be linked to things like money, roads and bridges, skilled workers, digital skills, and getting projects done on time. The SIDF is an organization that helps connect all these things by providing money and support for industry. It's like a bridge that helps industry grow by giving it the tools it needs to succeed. This way, factories can make high-quality products, create jobs, and help the country's economy grow. By doing so, the country can become more competitive and prosperous, which is good for everyone.

8.2 Saudi Industrial Development Fund (SIDF).

SIDF is a specialized development finance institution that supports the growth and modernization of the industrial sector in Saudi Arabia. Its role includes financing industrial projects, supporting expansion, encouraging industrial investment, and helping factories achieve sustainable growth. Over time, SIDF's role has evolved to align with Vision 2030 and the needs of a more diversified industrial economy. SIDF support may affect factories through several mechanisms. First, access to finance allows firms to invest in machinery, production lines, buildings, utilities, and working capital needs. Second, feasibility and advisory processes can improve project planning and investment discipline. Third, SIDF's focus on strategic sectors can direct investment toward industries with national value. Fourth, SIDF programs can encourage technological modernization, efficiency improvement, and export readiness. These mechanisms provide the theoretical basis for linking SIDF support to factory development and competitiveness.

8.3. Factory Development.

Increasing the overall capabilities of any manufacturing organization is achieved through factory development A. It is not limited to increasing production capacity or introducing new machinery, but also encompasses improving the factory's physical infrastructure, operational efficiency, technological capabilities, and managerial effectiveness. The measures taken consist of upgrading equipment, strengthening maintenance and reliability systems, improving quality control techniques, developing employee skills, streamlining production processes, reducing waste, increasing workplace safety, and building robust supply chains. In essence, factory building is a

multifaceted strategy that merges financial and operational investments to achieve sustained operational excellence. In Saudi Arabia, factory development is a key component of the implementation of national economy diversification goals as part of Saudi Vision 2030, which emphasizes domestic manufacturing capabilities. Established factories are better equipped to meet local market demands, replace imported products where it is economically feasible, and compete successfully in global markets. Clearly defined long-term strategies, well-crafted project execution, and substantial financial resources are necessary to achieve these outcomes. The Saudi Industrial Development Fund (SIDF) offers more than just financial backing in this aspect. The SIDF's financing programs, advisory services, and project evaluation processes enable manufacturers to overcome investment obstacles while promoting sustainable industrial growth through disciplined planning.

8.4. Digital Transformation and Industry 4.0.

Modern manufacturing is defined by its emphasis on digital transformation. It encompasses the application of digital technologies in all aspects of factory operations, including production, maintenance, quality assurance, supply chain management, and strategic decision making. Industry 4.0 has contributed to the acceleration of this transformation through the use of technologies such as industrial automation, robotics, cloud computing and artificial intelligence digital twin applications that utilize digital technology for predictive maintenance or analytics, and advanced data analytics. By utilizing these technologies collectively, manufacturers can boost productivity, increase operational flexibility, improve product quality, and make more data driven decisions.

However, effective digital transformation does not entail spending too much on new technologies. Businesses must also acquire the competencies required to incorporate these technologies effectively. The prerequisites include capable leadership, a distinct digital strategy, proficient staff members and managers, effective change management, reliable data regulation frameworks, cybersecurity measures, and well-defined performance benchmarks. High implementation costs, lack of technical expertise, organizational resistance to change, and uncertainty about the return on investment are common issues faced by manufacturing firms. By offering financial support and technical assistance, SIDF can assist factories in overcoming these obstacles and implementing digital transformation projects with significant success.

8.5. Competitiveness.

A company's competitiveness is determined by its capacity to produce value through the consistent delivery of quality, innovation and reliability that customer can rely on. In the manufacturing industry, high productivity, efficient resource utilization, technological capability, operational flexibility, and quick response to changing market conditions are all indications of competitiveness. These capabilities are crucial in determining whether a company can maintain its market share within the country and abroad.'

Through digital transformation, competitiveness gains improved operational efficiency through reduced outages of equipment (indirect cost cutting), product traceability, quality control improvements through enhanced quality assurance, the strengthening of demand forecasting ("demand modelling") and faster managerial decision making. Besides, factory construction enhances competitiveness by increasing production capacity, improving equipment reliability and strengthening organizational capabilities. This study suggests that both factory development and digital transformation are crucial to the Saudi industrial sector's competitiveness.

8.6. Import Substitution and Local Content.

As the Kingdom seeks to diversify its economy and strengthen industrial resilience, it has identified reducing dependence on imported products as an important strategic priority. The act of import substitution involves enhancing the ability or potential of local manufacturers to manufacture goods that have traditionally been imported from foreign markets. This objective necessitated that local manufacturers meet competitive quality, cost-effectiveness of production, capacity for international markets and other requirements. If these capabilities are not present, imported alternatives may be unable to keep up with locally manufactured products.

Industrial development and import substitution are closely linked through competitiveness. With the development of advanced technology, operations, and production quality, Saudi factories are now better equipped to serve domestic markets and reduce dependence on imported products. Moreover, competitive manufacturers are better equipped to expand into export markets, strengthening the industrial base of Saudi Arabia. According to this study, SIDF support indirectly

promotes import substitution through factory development and digital transformation, which in turn improves industrial competitiveness.

8.7. Project Management Perspective.

Detailed projects and strategic programs are used to deliver factory modernization and digital transformation, rather than isolated activities. These projects typically involve the expansion of plants, the installation of equipment and systems, project automation, ERP implementation, maintenance or converting, quality improvement systems in addition to the deployment of digital platforms. Effective project management practices are crucial during the project life cycle, alongside technological proficiency.

Comprehensive planning, stakeholder engagement, scope definition and cost control, scheduling, procurement management including risk adjustment (including contracting), commissioning, and benefits realization are all essential for successful industrial transformation. Due to their extensive capital investment, feasibility studies, contractor management expertise and implementation milestones, as well as measurable performance objectives. A project's ability to deliver technically successful results may not be matched by sustainable business value due to inadequate employee training or organizational change management. Hence, project management provides an essential viewpoint for understanding the impact of SIDF initiatives on industrial transformation and long term organizational performance.

9. Conceptual Framework.

The conceptual framework presented in this paper outlines the role that SIDF support plays in driving industrial transformation within Saudi manufacturing firms. Both factory development and digital transformation rely on SIDF support as an independent factor. Both constructs are expected to increase organizational competitiveness, which contributes in turn to reducing dependence on imported products.

The framework assumes that digital transformation functions as a mediator between SIDF support and competitiveness. The adoption of digital technologies and modern management practices by manufacturing firms is necessary to achieve sustainable competitive advantage without relying solely on financial aid and advisory services.

The suggested connections are outlined below:

The provision of SIDF support supports the development of factories.

SIDF Support is committed to delivering Digital Transformation services.

- Factory Development → Competitiveness.
- Digital Transformation → Competitiveness.

A decrease in the dependence on imports leads to increased competitiveness.

Digital Transformation and Competitiveness require the support of SIDF.

The study will use validated literature as the basis for measurement items to operationalize these constructs A. Several indicators will be used to gauge SIDF support, including financing availability and advisory services, the accessibility of support programs, expansion assistance, and efforts to modernize. The Social Security Administration will also monitor the implementation of new projects in response to changes in government funding. The evaluation of factory development will involve factors such as production capacity, equipment modernization, operational efficiency, quality improvement, workforce capability, and maintenance performance. Measurements of digital transformation will include the adoption of automation technologies, ERP and MES systems, predictive maintenance, digitization reporting, technology integration, and quality traceability. Cost effectiveness, product quality, delivery, innovation, export readiness, customer satisfaction, and market position will be key factors in evaluating competitiveness. By utilizing local production capacity, increasing local sourcing, and replacing imported products with industrial inputs, reduced dependence on imports can be measured.

10. Research Methodology.

10.1. Research Approach.

This study is a quantitative research method because it seeks to use statistical techniques to examine and test the relationships between clearly defined variables. These quantitative approaches are particularly useful in assessing the effects of SIDF support on factory development, digital transformation, competitiveness, and import substitution. The structured questionnaire will

be distributed to manufacturing firms that have benefited from SIDF initiatives, providing objective feedback on the proposed conceptual model.

10.2. Research Design.

Participants will be collected at a single point in time for data collection in this cross sectional quantitative research design. Its design is suitable because it aims to study the existing links between SIDF support, factory development and digital transformation as well as competitiveness with foreign countries and import substitution among manufacturing firms in Saudi Arabia. Although a longitudinal study could yield better information about changes over time, it would involve substantial costs, prolonged data collection periods, and long-term access to participating organizations. A cross-sectional design is a practical and efficient solution for master's research projects, given the scope and timeframe required to test the proposed research hypotheses while also providing strong evidence. The approach has been extensively used in academic journals throughout the 1990s and 1990's by many Australian universities (e.g.

10.3. Population and Sample.

The Saudi Arabian population is a target for this study, and manufacturing companies that have received financial or technical assistance from the Saudi Industrial Development Fund SIDF during the implementation of Saudi Vision 2030 are included. It is seeking responses from people who have direct knowledge of SIDF funded projects and their impact on organizational performance. Factory managers, operations managers and maintenance managers, and their subordinates in industry and government may be included among these senior decision makers who are involved in strategic planning and industrial development.

Purposive sampling will be used because the research requires participants to have relevant experience and knowledge of SIDF initiatives. This method ensures that the data collected is based on informed opinions from experts who are directly involved in projects related to factory digitization and digital transformation. If a comprehensive database of SIDF-supported firms is accessible, stratified random sampling or other probability-based sampling methods may be utilized to enhance the sample's representativeness. However, statistical evidence supports this approach. The sample size required for multiple regression analysis and Partial Least Squares Structural Equation Modeling Partial Least Squares Structural Equation Modeling is estimated to

be between 150 and 300 valid responses, depending on the complexity of the proposed conceptual model. This number is considered adequate.

10.4. Data Collection Method.

The study will use both primary and secondary sources of data. A questionnaire will be distributed electronically to eligible respondents within SIDF-supported manufacturing firms, gathering crucial information through primary data. The survey will require participants to provide feedback on their experience with SIDF initiatives and participation in factory development or digital transformation projects. Respondents will be assessed on a five-point Likert scale of Strongly Disagree 11 to Strong LY Agree 5, which measures their perceptions of the study variables.

The survey results will be supplemented with secondary data, which will come from official SIDF publications, Saudi Vision 2030 reports, Ministry of Industry and Mineral Resources documents, academic journals, and other peer-reviewed sources. By combining primary and secondary data, the study will be considered more credible as it will provide both empirical support and a comprehensive understanding of the industrial environment.

10.5 Measurement of Variables.

Variable	Definition	Sample Indicators
SIDF Support	Financial and non-financial support received from SIDF initiatives.	Financing suitability, advisory support, program accessibility, modernization support.
Factory Development	Improvement in factory capacity and operational capability.	Capacity expansion, equipment upgrades, maintenance improvement, quality systems.
Digital Transformation	Adoption and integration of digital technologies in manufacturing operations.	Automation, ERP/MES, data dashboards, predictive maintenance, traceability.
Competitiveness	Ability to compete locally and globally through cost, quality, delivery, and innovation.	Productivity, cost efficiency, quality, delivery reliability, export readiness.
Reduced Import Dependence	Contribution to replacing imported products or inputs with local production.	Local production capability, local sourcing, replacement of imported finished goods.

10.6 Data Analysis Techniques

The collected data will be analyzed using IBM SPSS Statistics and Partial Least Squares Structural Equation Modeling depending on the requirements of the proposed research model. The analysis will begin with data screening to identify missing values, outliers, and inconsistencies before proceeding to descriptive statistical analysis. Reliability and validity tests will then be conducted to ensure that the measurement instrument accurately captures the intended constructs.

Internal consistency will be evaluated using Cronbach's Alpha and Composite Reliability (CR), while convergent validity will be assessed using the Average Variance Extracted (AVE). Discriminant validity will be examined using the Fornell Larcker Criterion and the Heterotrait Monotrait (HTMT) ratio, which are widely accepted procedures for evaluating measurement models in Partial Least Squares Structural Equation Modeling.

To test the proposed hypotheses, the study will employ regression analysis and Structural Equation Modeling Partial Least Squares Structural Equation Modeling. SPSS will primarily be used for descriptive statistics, correlation analysis, reliability assessment, and regression analysis, whereas Partial Least Squares Structural Equation Modeling will be used to evaluate the structural relationships among latent variables and to examine mediation effects within the conceptual framework. The final analytical approach will be determined in consultation with the research supervisor and will depend on the final questionnaire design and the characteristics of the collected data.

10.7 Validity and Reliability.

Ensuring the validity and reliability of the research instrument is essential to producing credible and trustworthy findings. Content validity will be established by developing questionnaire items from well established literature and previously validated measurement scales. The questionnaire will also be reviewed by academic experts and industry professionals to ensure that the items are relevant, clear, and appropriate for the Saudi manufacturing context.

Construct validity will be assessed statistically through factor analysis or the measurement model evaluation procedures available in Partial Least Squares Structural Equation Modeling. Reliability will be evaluated using Cronbach's Alpha and Composite Reliability, ensuring that each construct demonstrates an acceptable level of internal consistency.

Before launching the main survey, a pilot study involving 20 to 30 respondents will be conducted. The pilot test will help identify ambiguous questions, assess the overall reliability of the instrument, and improve the clarity and structure of the questionnaire. Feedback obtained during this stage will be incorporated before the final data collection begins.

11. Research Structure

The completed master's thesis will be organized into five chapters, each addressing a specific aspect of the research.

Chapter One: Introduction presents the background of the study, the research problem, objectives, research questions, hypotheses, significance of the study, research scope, and definitions of key concepts.

Chapter Two: Literature Review critically examines previous research related to SIDF, Saudi Vision 2030, industrial development, digital transformation, Industry 4.0, competitiveness, import substitution, and project management. The chapter also establishes the theoretical foundation and identifies the research gap addressed by this study.

Chapter Three: Research Methodology explains the research philosophy, design, population, sampling strategy, data collection procedures, research instrument, validity and reliability assessment, ethical considerations, and statistical techniques used to analyze the data.

Chapter Four: Results and Analysis present the empirical findings, including descriptive statistics, measurement model assessment, hypothesis testing, and interpretation of the statistical results.

Chapter Five: Discussion, Conclusions, and Recommendations interpret the findings in relation to previous studies, discusses theoretical and practical implications, outlines the study's limitations, and provides recommendations for policymakers, practitioners, and future researchers.

12. Research Limits

Like any empirical investigation, this study is subject to several limitations that define its scope and ensure its feasibility.

Geographically, the research is limited to manufacturing firms operating within the Kingdom of Saudi Arabia. From an industrial perspective, the study focuses exclusively on manufacturing organizations that have received support from the Saudi Industrial Development Fund (SIDF), rather than examining all government industrial support programs.

The research also concentrates on the Vision 2030 period, during which industrial transformation and digital modernization have become national priorities. Methodologically, the study adopts a cross-sectional survey design, which captures participants' perceptions at a single point in time and therefore cannot establish long-term causal relationships.

Furthermore, the findings will rely on responses from managers and professionals who possess relevant knowledge of SIDF supported initiatives. Finally, the conceptual scope of the research is limited to factory development, digital transformation, competitiveness, and import substitution, without examining broader macroeconomic or national economic indicators.

13. Expected Contributions

This study is expected to make meaningful contributions to academic research, industrial practice, and project management.

From an academic perspective, it will contribute to the growing body of knowledge on development finance, digital transformation, and manufacturing competitiveness by providing empirical evidence from the Saudi Arabian context. The proposed research model will offer new insights into how government supported industrial financing contributes to organizational transformation and competitive performance.

From a practical perspective, the findings will provide valuable recommendations for SIDF, policymakers, and manufacturing firms by identifying the types of support that have the greatest influence on factory development and digital transformation. The study may also demonstrate how digital transformation serves as a key mechanism through which financial support translates into long-term competitive advantage.

From a project management perspective, the research emphasizes that financial investment alone is insufficient to achieve sustainable industrial success. Organizations must combine financial resources with effective project governance, technology implementation, workforce development, process improvement, change management, and continuous performance monitoring to realize the full benefits of industrial transformation initiatives.

14. Ethical Considerations

This study will be conducted in accordance with internationally recognized ethical principles governing academic research. Participation in the survey will be entirely voluntary, and all respondents will receive clear information regarding the purpose of the study before deciding whether to participate. Participants will have the right to withdraw from the research at any stage without consequence.

The questionnaire will avoid collecting unnecessary personal or confidential information, and all responses will remain anonymous and confidential. Data collected during the study will be used solely for academic purposes and will not be shared with third parties. The identities of participating organizations and individuals will not be disclosed unless explicit written permission has been granted.

The researcher is committed to maintaining the highest standards of academic integrity throughout the research process. All data will be analyzed and reported honestly, without manipulation or selective reporting of results. Every source used in the study will be properly acknowledged using APA 7th edition referencing to ensure transparency and avoid plagiarism. Where required by university regulations, ethical approval will be obtained from the relevant institutional review board before commencing data collection.

15. Initial Reference List

Alshammari, M., & Alnajem, M. (2023). Digital transformation and organizational performance in manufacturing: The role of technological capability and organizational readiness. *International Journal of Production Economics*, 264, 108964.

- Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital business strategy: Toward a next generation of insights. *MIS Quarterly*, 37(2), 471-482.
- Kagermann, H., Wahlster, W., & Helbig, J. (2013). Recommendations for implementing the strategic initiative Industrie 4.0. National Academy of Science and Engineering.
- Ministry of Industry and Mineral Resources. (2024). Industrial sector publications and indicators. Government of Saudi Arabia.
- Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. Free Press.
- Porter, M. E. (1990). *The competitive advantage of nations*. Free Press.
- Project Management Institute. (2021). *A guide to the project management body of knowledge (PMBOK Guide) (7th ed.)*. Project Management Institute.
- Saudi Industrial Development Fund. (2024). Annual report 2024. <https://www.sidf.gov.sa/>
- Saudi Industrial Development Fund. (2025). Annual report 2025. <https://www.sidf.gov.sa/>
- Saudi Industrial Development Fund. (n.d.). Market in focus: Digitalization in the manufacturing sector. <https://www.sidf.gov.sa/>
- Saudi Vision 2030. (2024). Vision 2030 annual report 2024. <https://www.vision2030.gov.sa/>
- Saudi Vision 2030. (2025). National Industrial Strategy. <https://www.vision2030.gov.sa/>
- Schwab, K. (2016). *The fourth industrial revolution*. World Economic Forum.
- Teece, D. J. (2018). Business models and dynamic capabilities. *Long Range Planning*, 51(1), 40-49.
- World Economic Forum. (2020). *The future of production: Advanced manufacturing and value chains*. World Economic Forum.

Appendix A: Draft Questionnaire Items

The following draft items may be refined after supervisor review and pilot testing. Respondents will be asked to indicate their level of agreement using a five-point Likert scale.

SIDF Support

- SIDF support helped our factory obtain suitable financing for development projects.
- SIDF support encouraged better feasibility planning before project implementation.
- SIDF initiatives supported modernization and expansion of our factory.
- SIDF requirements improved project discipline and investment planning.

Factory Development

- Our factory improved production capacity after receiving support.
- Our factory upgraded equipment and production systems.
- Our factory improved maintenance and reliability practices.
- Our factory improved quality management and operational efficiency.

Digital Transformation

- Our factory adopted digital systems for production planning or monitoring.
- Our factory uses data to support operational decision making.
- Our factory improved automation or process control.
- Our factory uses digital tools for quality traceability, maintenance, or reporting.

Competitiveness

- Our factory improved cost efficiency.
- Our factory improved product quality.
- Our factory improved delivery reliability.
- Our factory became more capable of competing locally and internationally.

Reduced Import Dependence

- Our factory helped replace imported products with locally produced alternatives.
- Our factory increased the use of local inputs or suppliers where feasible.
- Our factory contributed to local content objectives.
- Our factory improved the availability of locally manufactured products.

Appendix B: Proposed Research Timeline

Stage	Main Activity	Estimated Duration
1	Proposal approval and supervisor feedback	2 weeks
2	Detailed literature review	4 weeks
3	Questionnaire development and pilot test	3 weeks
4	Data collection	4-6 weeks
5	Data cleaning and statistical analysis	3 weeks
6	Discussion and conclusion writing	3 weeks
7	Final editing, formatting, and submission	2 weeks

Appendix C: Operational Definition Matrix

The operational definition matrix is designed to enhance the methodological rigor of this study by clearly linking each research variable to its conceptual meaning, measurement indicators, data source, and role within the proposed analytical framework. Establishing these connections helps ensure that abstract concepts such as factory development, digital transformation, competitiveness, and import substitution are translated into clearly defined and measurable constructs that can be examined through statistical analysis.

The matrix will be reviewed and refined in consultation with the research supervisor before the final questionnaire is distributed. This review process will help verify that the selected indicators accurately represent each construct and are appropriate for the Saudi manufacturing context. By providing a structured framework for operationalizing the study variables, the matrix strengthens the validity and consistency of the research methodology while supporting reliable data collection and meaningful interpretation of the findings.

Construct	Operational Meaning	Indicative Measures	Expected Direction	Analysis Role
SIDF Support	The perceived usefulness and accessibility of SIDF financial and enabling support.	Financing fit, support speed, advisory usefulness, program clarity, support for modernization.	Positive relationship with development and digital transformation.	Independent variable.
Factory Development	The degree to which the factory improved its physical, operational, and managerial capabilities.	Capacity, equipment renewal, maintenance maturity, quality systems, workforce capability.	Positive relationship with competitiveness.	Mediator or dependent variable.

Digital Transformation	The degree to which digital tools are adopted and integrated into factory operations.	Automation, ERP/MES, dashboards, predictive maintenance, digital traceability, data-based decisions.	Positive relationship with competitiveness.	Mediator variable.
Competitiveness	The factory ability to compete through cost, quality, delivery, innovation, and market access.	Cost efficiency, product quality, delivery reliability, flexibility, customer satisfaction, export readiness.	Positive relationship with import substitution.	Dependent or mediator variable.
Reduced Import Dependence	The contribution of local manufacturing capability to replacing imported goods or inputs.	Local production, local content, local sourcing, replacement of imported products, supply resilience.	Outcome of improved competitiveness.	Final dependent variable.

Appendix D: Preliminary Research Quality and Risk Plan

Because this study brings together public policy, industrial development, and digital transformation, careful attention must be given to managing potential risks that could affect the quality, reliability, and interpretation of the research findings. Factors such as low survey participation, respondent bias, data quality issues, and limitations in accessing relevant information may influence the overall outcomes if they are not addressed appropriately.

To minimize these risks, a research quality and risk management plan has been developed to identify potential challenges and outline practical mitigation strategies throughout the research process. Including this plan not only strengthens the methodological rigor of the study but also reflects established project management principles by demonstrating how the research will be planned, monitored, and controlled from data collection through to analysis and reporting. This structured approach helps ensure that the study produces reliable, credible, and ethically sound findings while maintaining the quality standards expected of master's level research.

Potential Risk	Effect on Study	Mitigation Action	Responsible Party
Low survey response rate	Weak statistical power and limited generalizability.	Use professional networks, follow-up reminders, clear invitation	Researcher.

		message, and supervisor support.	
Respondents lack knowledge of SIDF support	Inaccurate or superficial answers.	Use screening questions and target managers who understand finance, projects, operations, or digital transformation.	Researcher.
Sensitive company information	Participants may avoid answering questions.	Use anonymous responses and ask perception-based questions rather than confidential financial data.	Researcher and supervisor.
Measurement ambiguity	Variables may be interpreted differently across factories.	Use clear definitions, pilot testing, and expert review before final survey distribution.	Researcher and academic supervisor.
Bias from self-reported data	Results may reflect perceptions rather than verified performance.	Compare findings with secondary reports where possible and acknowledge this limitation in the final thesis.	Researcher.
Time constraints	Incomplete data collection or rushed analysis.	Use a realistic timeline, early questionnaire preparation, and weekly progress monitoring.	Researcher.

The quality plan also requires a clear document control process. The researcher will maintain version control for the proposal, questionnaire, data file, analysis outputs, and final thesis chapters. Data cleaning decisions will be documented to support transparency. Statistical outputs will be saved and cross checked before interpretation. These actions help ensure that the final thesis is not only academically acceptable but also managed as a structured project with defined scope, schedule, risks, and quality expectations.