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Chapter-1: Introduction

1.1 Proposed Title:

“Digital Transformation and Traceability in the B2B Agricultural Supply Chain: A Study of Vegetable Packaging Firms in Bangladesh.”

1.2 Background and Rationale:

The vegetable packaging sector in Bangladesh is under increasing pressure to become more contemporary in terms of agricultural supply chains, making them more transparent, more efficient, and more sustainable. The introduction of digital technologies, including blockchain, QR codes, and IoT-based traceability, is changing the conventional B2B operations into data-driven systems that improve the process of tracking and compliance products (Ali et al., 2023). In the case of SMEs, the trust generated through digital traceability will lower transaction costs, enhance long-term relationships, and strengthen them (Kshetri, 2018). The increasing worldwide need to use traceable and ethically sourced products also pressures Bangladeshi exporters to adopt these new developments (Tsan et al., 2021).

1.3 Research Aim:

The main objective of this study is to understand the impacts of digital transformation (use of blockchain, QR code system, and digital traceability tools) on trust, transparency, and long-term contractual relationships in the B2B agricultural supply chain with references to the vegetable packaging companies in Bangladesh.

1.4 Research Objectives:

The following objectives are to be attained by the study:

- a) To test the degree of adoption of digital traceability in B2B vegetable packaging companies in Bangladesh.
- b) To examine how digital traceability and formation of trust in B2B transaction relate.
- c) In order to establish the obstacles and enablers which influence the adoption of digital transformation technologies within Bangladeshi SMEs.
- d) To suggest a digital traceability adoption model that is specific to the agricultural packing industry in the developing economies.

1.5 Research Questions:

The following research questions will inform the dissertation:

1. What is the effect of digital traceability on trust and long-term contractual relationship in the B2B agricultural supply chain?
2. What do you consider the primary obstacles to adopting digital traceability in vegetables packaging SMEs in Bangladesh?
3. What can be done to streamline digital transformation structures so as to create transparency in the agricultural sector of B2B transactions and lower transaction costs?

1.6 Problem Statement:

Although the world is digitally transforming to agri-business, in Bangladesh, many vegetable packaging companies are still using the traditional record-keeping and manual supply chain systems. This hinders their capacity to offer clear, traceable, and reliable information to B2B purchasers which lowers competition in local and overseas markets. Although technologies, like blockchain and QR-traceability systems, have the potential of increasing the level of trust and lowering the cost of transactions, the level of adoption is low because of infrastructural, financial, and skills-based challenges.

Chapter - 2. Literature Review

Online Revolution and Traceability of B2B Agricultural Supply Chain: A Case Study of the Vegetable Packaging companies in Bangladesh.

2.1 Theoretical Foundation

The study is based on three connected models explaining how the digital transformation and traceability can help increase trust, transparency, and efficiency in the supply chains. Technology-Organisation-Environment (TOE) framework (Tornatzky and Fleischer, 1990) is the approach through the analysis of internal preparedness and external pressures on the adoption of technology in Bangladeshi SMEs (Ali et al., 2023). The digital traceability minimises uncertainty and monitoring costs as pointed out in the paper by Williamson, 1985, which is the Transactions Cost Economics (TCE) (Queiroz and Wamba, 2019). The long-term B2B relationships rely on trust and commitment as the basis of long-term relationships (Commitment-Trust Theory as applied by Morgan and Hunt, 1994; Kshetri, 2018).

2.2 Key Themes and Theories

The study is based on three connected models explaining how the digital transformation and traceability can help increase trust, transparency, and efficiency in the supply chains. Technology-Organisation-Environment (TOE) framework (Tornatzky and Fleischer, 1990) is the approach through the analysis of internal preparedness and external pressures on the adoption of technology in Bangladeshi SMEs (Ali et al., 2023). The digital traceability minimises uncertainty and monitoring costs as pointed out in the paper by Williamson, 1985, which is the Transactions Cost Economics (TCE) (Queiroz and Wamba, 2019). The long-term B2B relationships rely on trust and commitment as the basis of long-term relationships (Commitment-Trust Theory as applied by Morgan and Hunt, 1994; Kshetri, 2018).

2.3 Key Studies and Debates

Author(s) and Year	Focus of Study	Key Findings	Limitations / Research Gap
Queiroz & Wamba (2019)	Blockchain in supply chain transparency	Blockchain improves traceability and reduces transaction costs.	Lack of empirical data from developing economies.
Kshetri (2018)	Blockchain's role in developing economies	Promotes trust, authenticity, and transparency in B2B supply chains.	Limited focus on SMEs and cost implications.
Haque et al. (2022)	SME digitalization in Bangladesh	Identifies resource and knowledge constraints in digital adoption.	Does not examine supply chain implications.
Bai et al. (2023)	Sustainable agricultural supply chain transformation	Digital technologies improve efficiency and environmental sustainability.	Focused on global contexts, not localized markets like Bangladesh.
Islam & Hossain (2022)	Blockchain in agricultural logistics in Bangladesh	Digital tools enhance supply chain coordination and reduce delays.	Implementation challenges not deeply explored.

These studies collectively reveal consensus on the transformative potential of digital traceability while emphasizing gaps related to SMEs, trust-building, and contextual barriers in low-income economies.

2.4 Research Gap

Nevertheless, even though much research has been done on digital transformation, there are significant gaps. Majority of the research is done concerning the developed economies and Bangladesh is under explored. There is little empirical literature on the connexion between digital traceability and trust and B2B relationships. Few of them embrace mixed-method and little is known about interactions between infrastructural, organisational, and relational aspects in technology adoption.

2.5 Conceptual Framework

TOE, TCE, and Commitment-Trust Theory are combined in the conceptual framework to connect the digital transformation, traceability, and trust. It argues that technology readiness, organisational ability and environmental pressures lead to adoption, which subsequently decreases transaction costs and creates trust, digital traceability is a case of operational and relationship innovation in Bangladeshi supply chains.

Chapter - 3: Research Methodology

The chapter presents a methodological design of the research titled Digital Transformation and Traceability in the B2B Agricultural Supply Chain: A Study of Vegetable Packaging Firms in Bangladesh. The methodology incorporates the philosophical, strategic, and procedural phases of research in accordance with the hierarchical Onion Model by Saunders et al. (2019).

3.1 Research Philosophy

This paper follows a critical realism philosophy, which appreciates the existence of an objective reality that is perceived using social structures and experiences (Bhaskar, 2008). It is appropriate to research typical of a mix of quantitative (e.g., transaction costs) and qualitative (e.g., trust,

readiness) aspects. Critical realism promotes the mixed-method approach of the study by balancing positivism and interpretivism (Saunders et al., 2019).

3.2 Research Approach

The research uses inductive-deductive methodology. The qualitative interviews are analysed using inductive reasoning to find contextual themes on digital traceability and trust and using deductive reasoning to statistically test the relationship between them and surveys (Creswell and Plano Clark, 2018). This two-step process guarantees a grounded theory building and empirical verification of the substantive B2B adoption and trust constructs.

3.3 Research Strategy

It is of mixed-method (case-survey mixture) design. There is some background information on case studies of three Bangladeshi vegetable packaging companies which are using blockchain or QR traceability (Yin, 2018), and surveys of SMEs and B2B purchasers measure adoption of digital, trust, and effectiveness. Such as triangulated research enhances validity and richness of study (Venkatesh et al., 2013).

3.4 Data Collection Methods

Data collection will be conducted in two processes. In order to establish certain information regarding motivation, barriers, and experiential experiences during the adoption of digital traceability tools, the owners, IT managers, and procurement officers of sampled packaging SMEs will be interviewed in semi-structured interviews first to get a bit more information on the motivations, barriers, and experiences of adopting digital traceability tools. The interviews will be an average of 12-15. The interviews will be conducted and tape recorded and informed consent will be given between 45 and 60 minutes.

Second, it will set systematic survey among additional sampled 100120 packaging companies and B2B purchasers through the Internet and in the field. The survey will make use of Likert-scale on the survey items to measure the constructs of ease of use of the IT, level of trust, reduction in transaction costs and digital readiness. The qualitative and quantitative methods are combined that is why it became possible to concentrate on the analysis of attitudes and quantifiable relations at the same time (Bryman, 2016; Bryman, 2016).

3.5 Sampling Strategy

The proposed design will involve the use of purposive sampling in which the qualitative interviews would be implemented and the quantitative survey would be involved in stratified random sampling. The purposive sampling technique will ensure that the interviewees possess first-hand experience of digital transformation of the packaging supply chains. The quantitative step will comprise of three levels, i.e., (1) the technology-enabled companies, (2) the traditional companies, and (3) the B2B buyers.

The agricultural packaging industry sample will be suitable to reflect a representative of the SMEs by using Cochran (1977) formula to represent the sample size. The method enhances the level of reliability and ensures that the proportion of digital adopters and non-adopters is represented (Etikan & Bala, 2017; Etikan & Bala, 2017).

3.6 Data Analysis

Qualitative data on interviews interpretation will be conducted by using thematic analysis as suggested by Braun and Clarke (2006). The numerical data will be coded to establish common trends on the use of technology, building of trust and operational concern. NVivo will be employed in assisting to organise themes and guard against analytical integrity (Braun and Clarke, 2006; Braun and Clarke, 2006).

Quantitative data will be analysed with the help of the SPSS or Smart PLS. Assisting in the explanation of the trends of adoption, inferential tests, such as the regression analysis, correlation analysis will be used to test the relationships between such variables as digital traceability, transaction costs, trust. Structural Equation Modelling (SEM) might be applied to support the conceptual framework and test the causal pathways (Hair et al., 2021; Hair et al., 2021).

3.7 Ethical Considerations

The study is ethically pure since informed consent that anonymity and voluntary participation are ensured. The respondents are also free to withdraw at their own will without being punished. According to the institutional ethics, the information will be kept safely (Israel & Hay, 2006). Formal university ethics approval of fieldwork will precede this and only results will be disseminated to stakeholders without participant identification.

3.8 Feasibility

The study will be achievable through the access of industry associations and SME networks in Bangladesh. The duration to be used as a sample will be three months and personal visits will help in overcoming the rural areas and internet barriers. NVivo and SPSS are available at institutions, which ensures preparedness of resources. The research has philosophical soundness, empirical thoroughness, and moral diligence.

Chapter - 4. Expected Findings

4.1 Anticipated Results

The research also expects a positive relationship between the adoption of digital traceability (e.g., blockchain, QR codes) and B2B agricultural market trust. These technologies increase

transparency, decrease opportunism, and decrease transaction costs according to the Transaction Cost Economics (TCE), which is more coordinated, efficient, and long-term partnerships (Williamson, 1985; Saberi et al., 2019).

4.2 Expected Contribution

The paper builds on the TOE model by identifying a relationship between technology adoption and trust and transaction cost reduction not only to incorporate technology perspective but also relational and economic perspective in business-to-business markets. It promotes the digital transformation theory to resource-constrained economies such as Bangladesh, providing the managerial and policy implications about the competitiveness and modernization of SMEs (Kshetri, 2018; Islam and Hossain, 2022).

Chapter - 5. Limitations

5.1 Anticipated Constraints

The researchers indicate that the paper has the disadvantage of poor digital data access and reliability in Bangladeshi SMEs (Reddy et al., 2020), small sample size, and possible response bias. The data validity and interpretation might be also influenced by contextual issues, such as a poor internet connexion, a cultural resistance, and poor institutional support (Bai et al., 2023) and the complexity of integrating the methods.

5.2 Mitigation Strategies

To manage the limitation of data, the research adopts the triangulation method utilising surveys, interviews, and secondary information (Queiroz and Wamba, 2019). The selection of a wide sample of SMEs makes it representativeness whereas anonymity minimises bias. Digital literacy

courses can increase awareness and longitudinal studies can be suggested to increase credibility and track digital transformation across the time.

Chapter - 6. Timeframe (Research Schedule)

Here's a fully developed timeframe plan for your dissertation proposal — consistent with your topic “Digital Transformation and Traceability in the B2B Agricultural Supply Chain: A Study of Vegetable Packaging Firms in Bangladesh”.

It follows a realistic master's-level schedule (approx. 16–18 weeks), matching your provided structure.

Phase / Task	Start Date	End Date	Duration (Weeks)	Notes
Topic Identification	16 Oct 2025	21 Oct 2025	1	Finalize research title and confirm relevance with supervisor.
Proposal Development	21 Oct 2025	28 Oct 2025	1	Draft and refine research proposal, focusing on aims, rationale, and methods.
Ethics Form Preparation	28 Oct 2025	4 Nov 2025	1	Complete ethical approval documents ensuring confidentiality and consent procedures.
Submission of Proposal & Ethics Documents	4 Nov 2025	5 Nov 2025	1	Submit finalized proposal and ethical approval form for review.
Literature Review	21 Oct 2025	2 Dec 2025	5	Conduct extensive literature review on blockchain, digital transformation, and B2B

				traceability; identify research gap and theoretical framework.
Methodology Chapter Drafting	11 Nov 2025	30 Nov 2025	3	Design research philosophy, approach, data collection, and analysis methods following the Onion model (Saunders et al., 2019).
Pilot Study & Questionnaire Testing	1 Dec 2025	10 Dec 2025	1.5	Pre-test interview and survey tools with selected SME respondents to ensure clarity and validity.
Data Collection (Survey + Interviews)	11 Dec 2025	15 Jan 2026	5	Conduct semi-structured interviews and distribute survey to B2B buyers and vegetable packaging SMEs across Bangladesh.
Data Analysis (Qualitative + Quantitative)	16 Jan 2026	15 Feb 2026	4	Perform thematic analysis using NVivo and statistical analysis with SPSS/SmartPLS.
Results Interpretation & Discussion	16 Feb 2026	28 Feb 2026	2	Integrate findings with literature and theoretical models. Discuss implications for practice and policy.
Final Write-up and Editing	1 Mar 2026	15 Mar 2026	2	Write final dissertation chapters (Findings, Discussion, Conclusion). Proofread and format according to university guidelines.
Submission	16 Mar 2026	16 Mar 2026	1 day	Submit the completed dissertation to supervisor and repository.

Chapter - 7. Conclusion

The dissertation discusses the uses of digital transformation and traceability technologies to improve trust, transparency, and efficiency in the B2B vegetable packaging supply chains in Bangladesh including the blockchain and QR code. It analyses how they influence the cost of transacting business; the duration of the contract and the formation of trust and what measures are being taken to hinder adoption and how the same can be overcome. The research is expected to steer SMEs and other policy makers towards constructing a more competitive and transparent supply chains which will help to add in the theoretical and practical knowledge on sustainable digital modernization in Bangladesh and other emerging economies.

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