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An Application of Ism and Mic-Mac Approach to Modelling Factors Influencing the Intention to Adopt Digital Wallets

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***Abstract*—Digital wallets have transformed financial transactions worldwide. This study develops a structured model of factors influencing individuals' intention to adopt digital wallets using Interpretive Structural Modelling (ISM) and MICMAC (Matrix of Cross Impact Multiplications Applied to Classification) analysis. Drawing on technology acceptance, trust, and socio-economic perspectives, the research identifies key drivers—perceived usefulness, perceived ease of use, trust, perceived security, social influence, facilitating conditions, personal innovativeness, perceived risk, and government support—and uses expert judgment to build an ISM-based hierarchical model and MICMAC to classify factors by driving and dependence power. The findings will help policymakers, fintech firms, and researchers prioritize interventions that accelerate digital wallet adoption.**

***Index Terms*—Digital wallet, ISM, MICMAC, Technology adoption, Perceived security, Trust, Structural modelling**

I. INTRODUCTION

The last decade has witnessed rapid growth in digital payment technologies, with digital wallets emerging as a convenient, fast, and increasingly secure means for electronic transactions. While adoption rates vary across countries and demographics, understanding the factors that influence individual intention to adopt digital wallets remains critical for regulators, firms, and researchers. This paper proposes a comprehensive model using ISM and MICMAC to clarify relationships among influencing factors and to prioritize strategic interventions.

II. LITERATURE REVIEW:

Research on technology adoption has largely built on frameworks such as the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Diffusion of Innovations (DOI). TAM emphasizes perceived usefulness (PU) and perceived ease of use (PEOU) as primary determinants of behavioral intention. Trust and perceived security are critical in fintech contexts; financial services require confidence in the service provider and protection mechanisms. Social influence and facilitating conditions (e.g., infrastructure, merchant acceptance) also shape adoption decisions. Recent studies on mobile payments and digital wallets highlight the roles of perceived risk, government policy, and personal innovativeness.

III. THEORETICAL FRAMEWORK AND IDENTIFIED FACTORS:

Based on existing literature and exploratory interviews, the following factors are included:

- F1 - Perceived Usefulness (PU)
- F2 - Perceived Ease of Use (PEOU)
- F3 - Trust (in provider & system)
- F4 - Perceived Security
- F5 - Social Influence
- F6 - Facilitating Conditions (infrastructure & merchant acceptance)
- F7 - Personal Innovativeness
- F8 - Perceived Risk
- F9 - Government Support & Policy
- F10 - Behavioral Intention to Adopt (BI)

IV. RESEARCH OBJECTIVES:

1. To identify and structure the factors influencing the intention to adopt digital wallets.
2. To apply ISM to build a hierarchical model of interrelationships among factors.
3. To use MICMAC analysis to classify factors by driving and dependence power.

V. METHODOLOGY:

This study employs a two-stage methodology: Interpretive Structural Modelling (ISM) to derive a structured model from expert judgments, followed by MICMAC analysis to classify factors based on driving and dependence powers.

5.1RESEARCH DESIGN

A mixed-method approach: qualitative expert elicitation (for pairwise relationships) and quantitative validation using survey data.

5.2 ISM PROCEDURE (SUMMARY):

1. Identify relevant factors through literature review and interviews.
2. Construct a Structural Self-Interaction Matrix (SSIM) using pairwise comparisons by domain experts.
3. Convert SSIM into a binary Reachability Matrix, including transitivity checks.
4. Partition the reachability matrix to determine hierarchical levels.
5. Develop the ISM-based directed graph and interpret relationships.

5.3 MICMAC ANALYSIS:

Calculate driving power and dependence power from the final reachability matrix and map factors into four clusters: autonomous, dependent, linkage, and driver factors.

5.4 DATA COLLECTION:

Expert panel (10–15 experts) for ISM; for empirical validation, a structured survey of at least 300 respondents across diverse demographics and geographies is recommended.

5.5 MEASUREMENT:

Use multi-item Likert scales (5-point) adapted from validated instruments: PU & PEOU (Davis, 1989), Trust (Gefen, 2000), Perceived Risk/Security (various fintech studies), Social Influence & Facilitating Conditions (Venkatesh et al.), Personal Innovativeness (Agarwal & Prasad).

VI. HYPOTHESES:

Based on theoretical background and the proposed conceptual model, the following hypotheses are framed:

H1: Perceived Usefulness (F1) positively influences Behavioral Intention to Adopt (F10).
H2: Perceived Ease of Use (F2) positively influences Perceived Usefulness (F1) and Behavioral Intention (F10).
H3: Trust (F3) positively influences Behavioral Intention (F10).
H4: Perceived Security (F4) positively influences Trust (F3) and Behavioral Intention (F10).
H5: Social Influence (F5) positively influences Behavioral Intention (F10).
H6: Facilitating Conditions (F6) positively influence Behavioral Intention (F10).
H7: Personal Innovativeness (F7) positively influences Behavioral Intention (F10).
H8: Perceived Risk (F8) negatively influences Behavioral Intention (F10).
H9: Government Support (F9) positively influences Facilitating Conditions (F6) and Behavioral Intention (F10).

VII. ANALYSIS PLAN:

PHASE 1 — ISM & MICMAC:

Collect SSIM values from experts using pairwise directional judgments (V, A, X, O). Convert to reachability matrix and generate ISM digraph. Perform MICMAC to identify driver and dependent factors.

PHASE 2 — EMPIRICAL VALIDATION:

Use Structural Equation Modeling (SEM) or Partial Least Squares-SEM (PLS-SEM) to test hypothesized relationships with survey data. Report fitness indices, path coefficients, t-values and effect sizes. Conduct

mediation/moderation analyses where relevant. Tools: ISM and MICMAC can be implemented in Excel/R/Python; SEM analysis can be performed using SmartPLS, AMOS, or R packages (lavaan, plspm).

VIII. EXPECTED FINDINGS AND CONTRIBUTIONS:

We expect to find a layered structure in which foundational drivers (e.g., Government Support, Facilitating Conditions, Perceived Security, Trust) influence intermediate constructs (PU, PEOU) that directly affect Behavioral Intention. MICMAC classification will likely identify Government Support and Facilitating Conditions as driver factors with high driving power. Contributions include methodological integration of ISM-MICMAC in fintech adoption research, and practical insights for policymakers and fintech firms.

IX. PRACTICAL IMPLICATIONS:

1. Policymakers: Prioritize clear regulatory frameworks and incentives to strengthen infrastructure and interoperability.
2. Fintech providers: Enhance perceived security and build trust through certification, transparency, and reliable customer support.
3. Marketers: Use social influence channels and early-adopter campaigns to boost visibility and perceived usefulness.

X. LIMITATIONS AND FUTURE RESEARCH:

Limitations: Reliance on expert judgment in ISM may introduce subjectivity; cross-sectional surveys limit causal inference; cultural/contextual differences may affect generalizability.
Future research: Comparative studies across countries, longitudinal adoption studies, integration with macro-level variables (e.g., GDP per capita, smartphone penetration).

XI. CONCLUSION:

This study offers a structured approach to understanding factors that influence digital wallet adoption using ISM and MICMAC. By revealing hierarchical relationships and classifying drivers and dependents, stakeholders can better target interventions to accelerate adoption while managing risk and building trust.

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