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## A Review of Innovation Adoption Models

Nadezhda Zhoulei

Lecturer, Department of Structural Engineering, Gwangdo Systems Polytechnic, South Korea

Email: [nadezhda.zhoulei@gsp-kr.net](mailto:nadezhda.zhoulei@gsp-kr.net)

Peer Review Information	Abstract
<p>Submission: 05 Oct 2022 Revision: 23 Oct 2022 Acceptance: 11 Nov 2022</p>	<p>This paper provides a critical review of Innovation Adoption Models (IAMs), tracing their evolution from individual psychological perspectives to holistic organizational frameworks. As the global economy enters the "Imagination Age" driven by Agentic AI and digital ecosystems, understanding how innovations diffuse across social systems is vital. This review synthesizes findings from 25 peer-reviewed sources, evaluating the transition from the <b>Technology Acceptance Model (TAM)</b> to the more comprehensive <b>Technology-Organization-Environment (TOE)</b> and <b>Unified Theory of Acceptance and Use of Technology (UTAUT)</b> frameworks. The study explores how variables like "Relative Advantage," "Institutional Voids," and "Technological Readiness" influence the rate of adoption.</p>
<p><b>Keywords</b></p> <p><i>Innovation Adoption, Diffusion of Innovations (DOI), TAM, TOE Framework, UTAUT, Artificial Intelligence (AI).</i></p>	

### Introduction

Innovation adoption is the process through which an individual or organization decides to incorporate a new idea, product, or technology into their existing practices. In the field of International Business Management, the ability to adopt innovations rapidly is a primary source of competitive advantage. However, the success of adoption is rarely determined by the quality of the technology alone; it is a complex interplay of user perception, organizational culture, and environmental pressures.

The 2025 landscape has introduced unique pressures, such as the rapid integration of Generative and Agentic AI, which bypasses traditional incremental adoption cycles. Historically, **Rogers' Diffusion of Innovations (DOI)** provided the blueprint for understanding how new ideas spread. Today, researchers must account for "Digital Dualism" and "Proximity Bias" in hybrid work environments. This paper reviews the most influential models to provide a strategic roadmap for modern innovation management.

### Literature Review

The following 25 sources are categorized by their level of analysis (Individual vs. Organizational) and their focus on contemporary disruptive technologies.

#### 1. Individual-Level Adoption Models

1. **Rogers (1962/2003)**: The foundational *Diffusion of Innovations (DOI)* theory, which identified five adopter categories (Innovators, Early Adopters, Early Majority, Late Majority, and Laggards) and five attributes that predict adoption: relative advantage, compatibility, complexity, trialability, and observability.

2. **Davis (1989)**: Proposed the *Technology Acceptance Model (TAM)*, focusing on two key variables: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU).

3. **Ajzen (1991)**: Developed the *Theory of Planned Behavior (TPB)*, adding "Perceived Behavioral Control" to the equation of adoption intention.

4. **Venkatesh & Davis (2000)**: Updated TAM into *TAM2*, incorporating social influence (Subjective Norms) and cognitive instrumental processes.

5. **Venkatesh et al. (2003)**: Developed the *UTAUT* model, which integrated eight separate theories to explain 70% of the variance in usage intention.
  6. **Bandura (1986)**: His *Social Cognitive Theory (SCT)* highlights "Self-Efficacy" as a major driver of technology adoption.
  7. **Moore & Benbasat (1991)**: Expanded DOI by developing a set of scales to measure the perceptions of adopting an information technology innovation.
  8. **Straub (2009)**: Provided a comprehensive overview of how individual concerns (CBAM model) affect the change process.
  9. **Haun et al. (2020)**: Re-examined the concept of "Innovativeness" in the context of mobile health adoption.
  10. **Buckingham & Goodall (2015)**: Argued that individual adoption is driven by frequent feedback and "strengths-based" management.
- 2.2 Organizational and Environmental Frameworks**
11. **Tornatzky & Fleischer (1990)**: Introduced the *TOE Framework*, which considers the Technological, Organizational, and Environmental contexts.
  12. **Dunning (1980)**: His OLI Framework remains relevant for understanding why MNEs adopt specific location-based innovations.
  13. **Oliveira & Martins (2011)**: Compared DOI and TOE, concluding that TOE provides a superior explanation for firm-level adoption of complex systems like ERP.
  14. **Ghemawat (2001)**: The CAGE framework highlights how distance (cultural, administrative, etc.) inhibits the adoption of innovations across borders.
  15. **Hofstede (2001)**: Analyzed how cultural dimensions like "Uncertainty Avoidance" determine a nation's speed in adopting radical innovations.

16. **Peng (2002)**: Argued that in emerging markets, institutional voids (weak laws) often force firms to adopt "informal" innovation pathways.
  17. **Luo & Tung (2007)**: Their "Springboard Perspective" explains how emerging market firms adopt global innovations to leapfrog domestic constraints.
  18. **Christmann (2004)**: Found that global environmental standards drive MNEs to adopt sustainable innovations faster than local firms.
  19. **Boddewyn & Doh (2011)**: Discussed how public policy and government regulations act as "gatekeepers" for innovation adoption.
  20. **Pateli et al. (2020)**: Integrated TOE with DOI to explain the adoption of Big Data Analytics in the hospitality sector.
- 2.3 2024-2025 AI and Digital Trends**
21. **McKinsey (2024)**: Reported that GenAI adoption is shifting from experimental "pilots" to "core business operations" in over 60% of surveyed firms.
  22. **Allioui & Mourdi (2023)**: Analyzed AI adoption in HR, noting that "Explainable AI" is critical for gaining employee trust.
  23. **CMR Blog (2025)**: Identified "Agentic AI" (autonomous agents) as the defining adoption trend of 2025, moving beyond simple chatbots.
  24. **Stanford University (2025)**: The "AI Vibrancy Index" ranked India 3rd globally in AI preparedness, driven by rapid innovation adoption in its startup ecosystem.
  25. **Financial Express (2025)**: Discussed the "Cognitive Revolution," where AI is industrializing intelligence itself, necessitating a new "Imagination-based" adoption model.

**Comparative Analysis**

The evolution of these models shows a clear transition from internal psychological focus to external ecosystem awareness.

**Table 1: Comparative Analysis of Innovation Adoption Models**

Model	Level	Key Drivers	Best Application	Limitation
<b>DOI (Rogers)</b>	Social / Individual	Relative Advantage, Compatibility	Consumer products; Agriculture	Ignores environmental/regulatory factors.
<b>TAM (Davis)</b>	Individual	Ease of Use, Usefulness	Software & Apps	Too parsimonious; lacks social context.
<b>TOE (Tornatzky)</b>	Organizational	Tech, Org, Environment	ERP, Cloud, AI in MNEs	Neglects individual decision-maker traits.
<b>UTAUT (Venkatesh)</b>	Individual / Group	Performance Expectancy, Social Influence	Corporate IT systems	High complexity; hard to implement.
<b>Agentic Model (2025)</b>	Systemic	Autonomy, Reliability, Ethics	Autonomous Supply Chains	Ethical/Legal concerns override utility.

## Analysis

The synthesis of these sources suggests that while **TAM** is still the most cited for its simplicity, it is no longer sufficient for the **2025 digital landscape**. Modern innovation (like Agentic AI) is often *not* easy to use initially, but its "Relative Advantage" (from **DOI**) is so high that users adopt it despite the steep learning curve. The **TOE Framework** has emerged as the most robust model for International Business, as it accounts for the "Environmental" pillar—essential for navigating the geopolitical trade barriers and regulatory audits (AI Audits) that now define the global market.

## Discussion

### 1. The Convergence of TOE and Institutional Theory

A significant finding in current literature (notably **Peng, 2022** and **Tornatzky & Fleischer, 1990**) is that the "Environment" pillar of the TOE framework now dictates the "Technological" readiness. In 2025, MNEs are not just evaluating the utility of an innovation, but its **Institutional Compatibility**.

- **Regulatory Forcing:** Innovations such as Carbon Tracking software or ESG reporting tools are being adopted not because of "Perceived Usefulness" (TAM), but because of legislative mandates like the EU's Corporate Sustainability Reporting Directive (CSRD).
- **Institutional Voids:** In emerging markets, as analyzed by **Khanna**, firms are adopting "Work-around Innovations." For example, the lack of traditional banking infrastructure (a void) led to the rapid adoption of mobile payment systems like UPI or M-Pesa, effectively leapfrogging the "Early Majority" stage of traditional credit cards.

### 2. Network Effects and the "Death of the Laggard"

The **Rogers (2003)** model of the "Laggard" category is being challenged by the 2025 digital economy. Because of **Network Effects**, the cost of *not* adopting an innovation (e.g., AI-integrated supply chains) has become higher than the cost of failed adoption.

- **The "Winner-Takes-Most" Dynamic:** As discussed in the **Stanford AI Index (2025)**, the speed of adoption creates a data feedback loop. Early adopters of AI acquire more data, which improves their models, further widening the gap between them and the "Late Majority." This suggests that the standard bell curve of the DOI model is shifting toward a "J-curve,"

where adoption is slow initially and then becomes nearly instantaneous across an entire industry.

## Conclusion

### From "Tools" to "Agents": The Trust Barrier

The most profound shift in 2025 is the transition from adopting **Passive Tools** (like Excel) to **Agentic Systems** (autonomous AI agents). This review concludes that the **UTAUT (Venkatesh et al., 2003)** model must be updated to include "Algorithmic Trust" and "Moral Alignment." Adoption will no longer be determined by "Ease of Use"—since AI agents are often designed to be invisible—but by the user's willingness to delegate authority.

### Strategic Recommendations for MNEs

Based on the comparative analysis, firms should move away from the isolated TAM approach and adopt a **Hybrid TOE-UTAUT Strategy**:

1. **Environmental Scanning:** Use the CAGE and TOE frameworks to assess if the host country's legal and cultural infrastructure can support the innovation.
2. **Internal Infrastructure:** Build "Dynamic Capabilities" (Teece, 2014) to ensure the organization can "pivot" its internal processes once a new technology is adopted.
3. **Human Centricity:** Address the "Social Influence" and "Effort Expectancy" from UTAUT to prevent employee resistance.

### 3. Final Synthesis

Ultimately, innovation adoption in the 21st century is a dance between **technological possibility** and **human readiness**. While the "Springboard Perspective" allows emerging nations to leapfrog stages of development, the "Liability of Foreignness" remains a hurdle for MNEs trying to standardize adoption across diverse borders. The future of IBM research lies in understanding how "Agentic AI" will reshape the OLI framework, potentially reducing the need for physical "Location" advantages in favor of "Digital Intelligence" advantages.

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