

Technology Acceptance Model

Theory · Extensions · Empirical Cases · β -Path Evidence | Davis (1989) & Beyond

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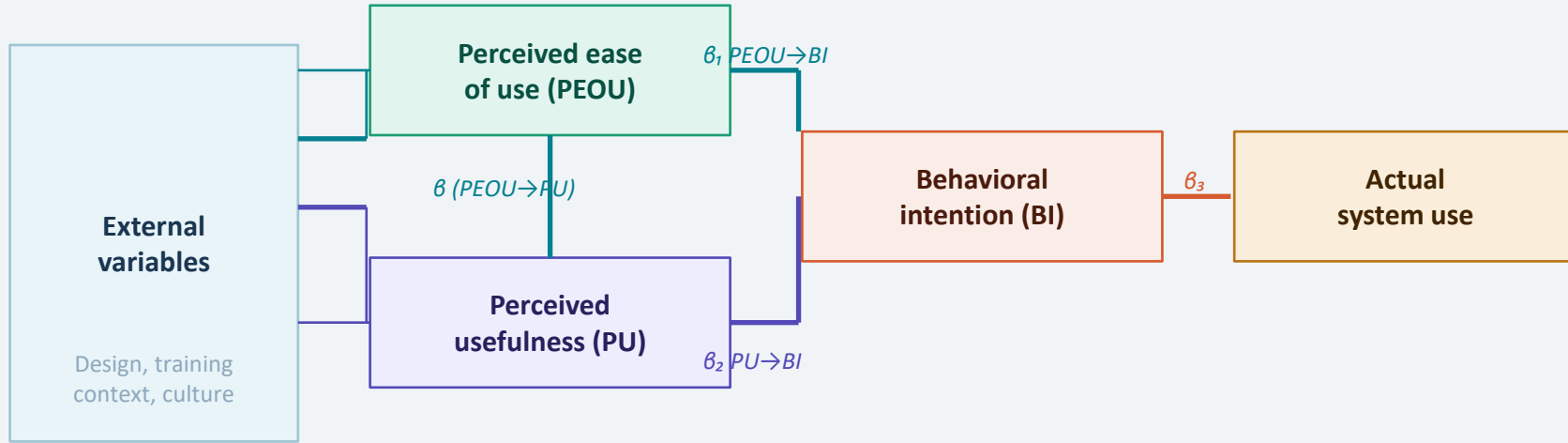
Synthesis & critique

Cross-cultural limits & research agenda

01

Base TAM Model

Davis (1989) — The foundational causal structure



Core propositions (Davis 1989)

- PU: degree to which a person believes technology will enhance job performance
- PEOU: degree to which a person believes the system will be free of effort
- PEOU influences PU (using something easier makes it seem more useful)
- Both PU and PEOU predict Behavioral Intention — PU is typically the stronger predictor

Perceived usefulness (PU) — 6 items

Using this system improves my job performance.
Using this system increases my productivity.
Using this system enhances my effectiveness.
I find this system useful in my job.
(Davis 1989, $\alpha = .98$)

Perceived ease of use (PEOU) — 6 items

Learning to operate this system is easy.
I find it easy to get the system to do what I want.
My interaction with the system is clear & understandable.
I find the system flexible to interact with.
(Davis 1989, $\alpha = .97$)

Behavioral intention (BI)

Measured by 2-3 items on intended frequency of use and likelihood of continued use. In voluntary contexts, BI strongly predicts actual use. In mandatory settings (e.g., enterprise ERP), BI is less predictive — actual use is compliance-driven.

Actual system use (AU)

Measured by self-reported frequency, duration, or system log data. Davis originally used self-report; later studies prefer objective log measures (login count, session length) to reduce common method bias.

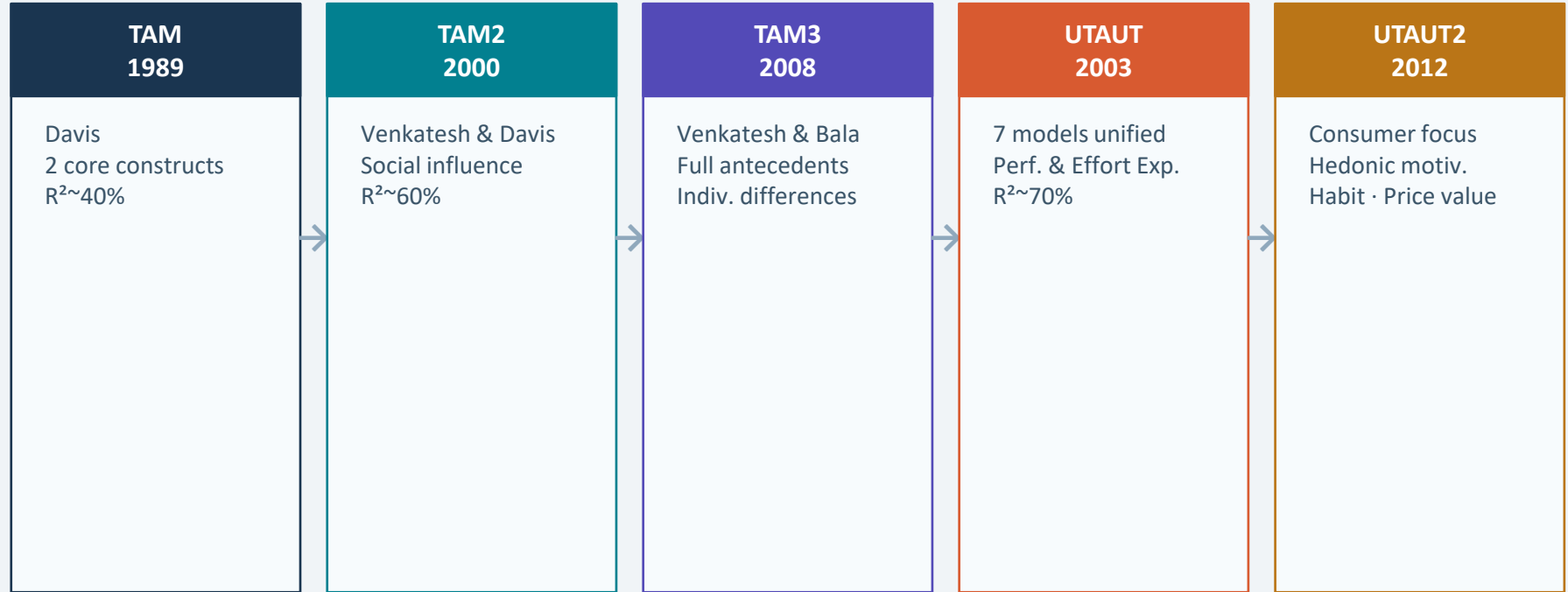
02

TAM Extensions

TAM2 · TAM3 · UTAUT · UTAUT2

From TAM to UTAUT — evolution of the model

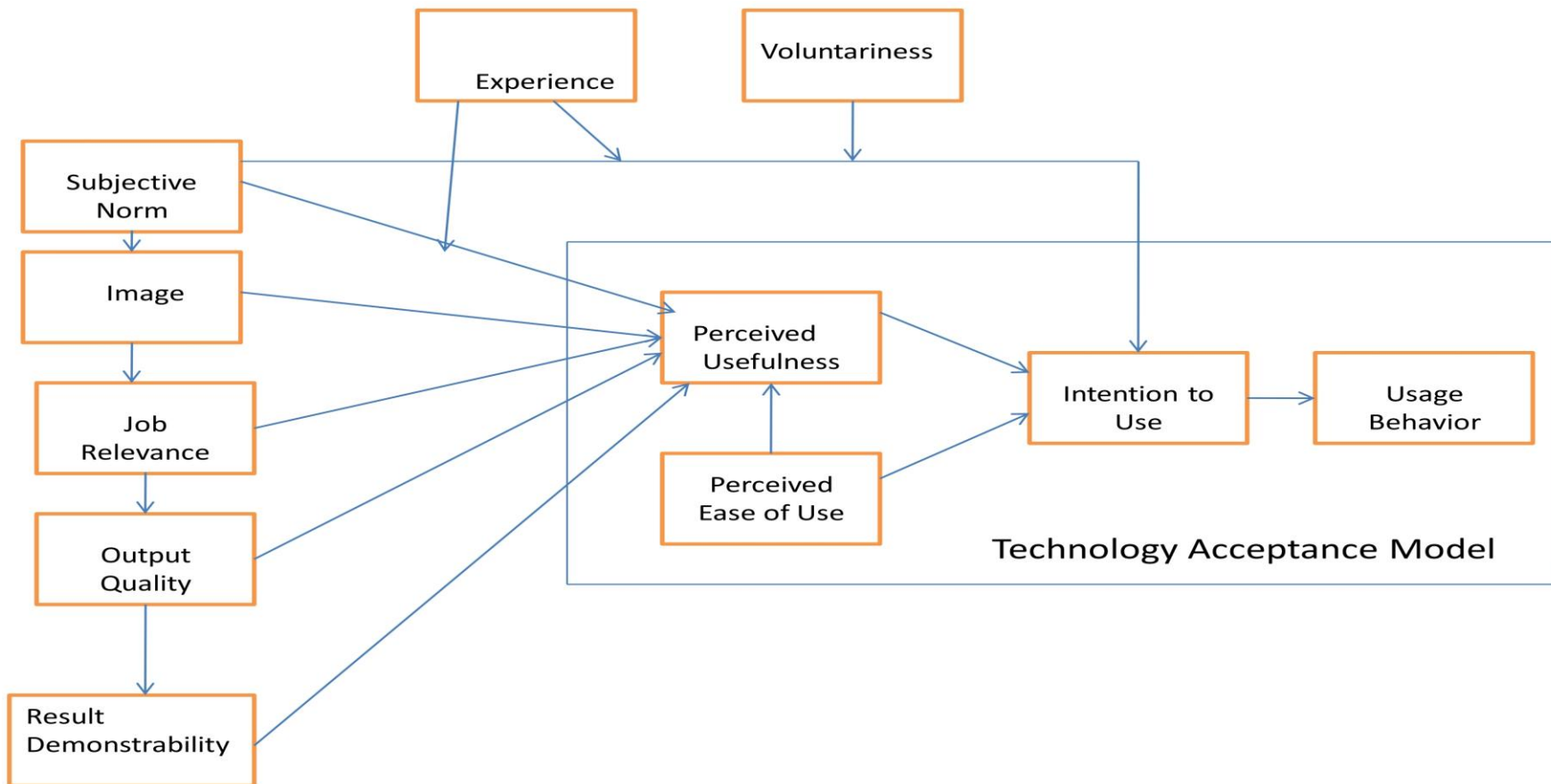
Framework



UTAUT synthesizes TAM, Motivational Model, Theory of Planned Behavior, TRA, Innovation Diffusion Theory, PC Utilization, and Social Cognitive Theory into 4 unified predictors — achieving the highest explained variance ($R^2 = 70\%$) in behavioral intention.

Technology Adoption Models are

1. Technology Acceptance Model(TAM)-1986
2. Technology Acceptance Model (TAM) (Davis, 1989)
2. Technology Acceptance Model (TAM) (Davis et al., 1989)
3. TAM-1: Final Version of Technology Acceptance Model- 1996
4. Extended Technology Acceptance Model (TAM 2) (2000)
5. Unified Theory of Acceptance and Use of Technology (UTAUT) (2003)
6. Technology Acceptance Model 3 (2008)
7. Extending Unified Theory of Acceptance and Use of Technology (UTAUT2) (2012)
8. Motivation Model (MM) (1992)
9. Motivational Model of Microcomputer Usage (1996)
10. Uses and Gratifications Theory (1974)
11. Diffusion of Innovations Theory (DOI) (1962)
12. Perceived Characteristics of Innovating Theory (PCIT) (1991)
13. Model of PC Utilization (MPCU)-(1991)



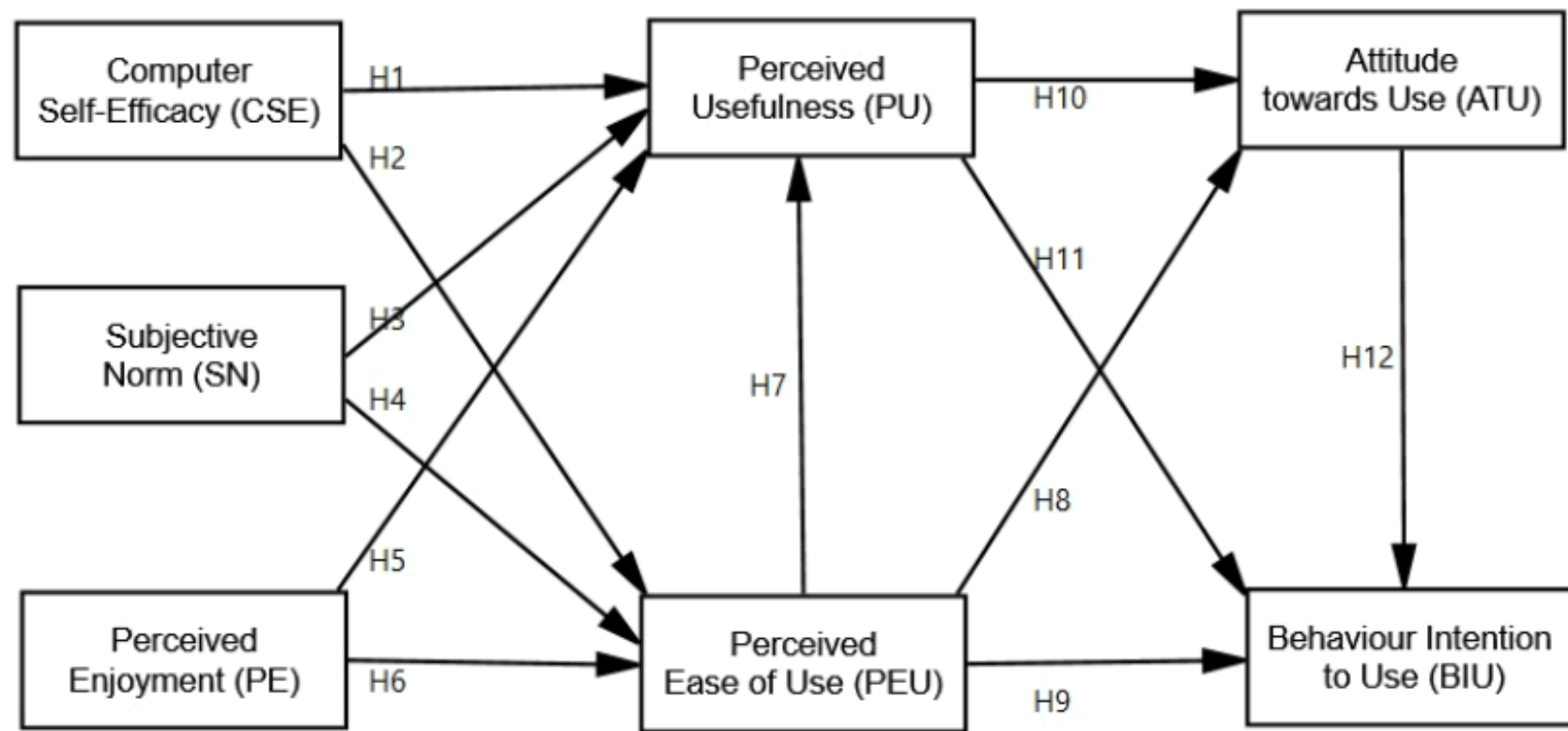


FIGURE 1
RESEARCH MODEL AND HYPOTHESES

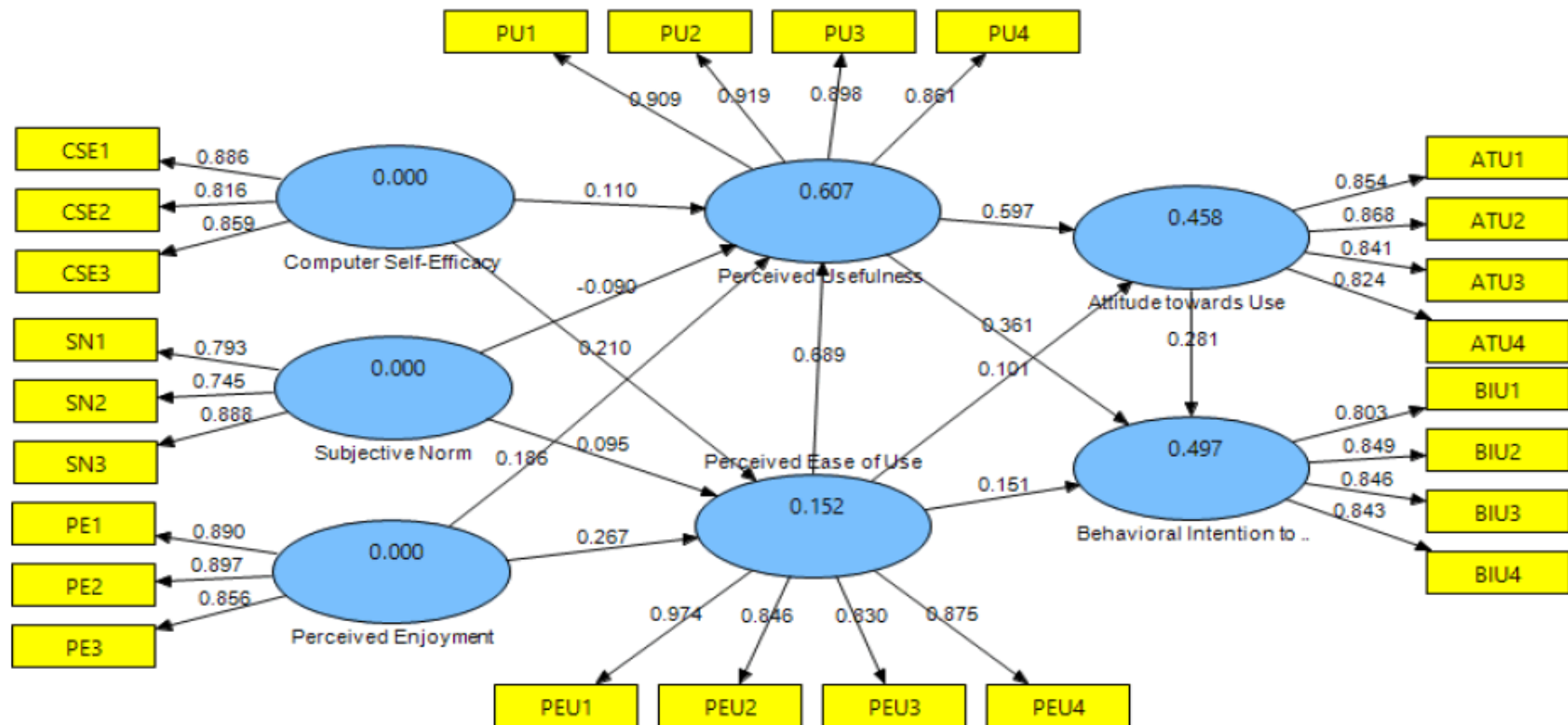
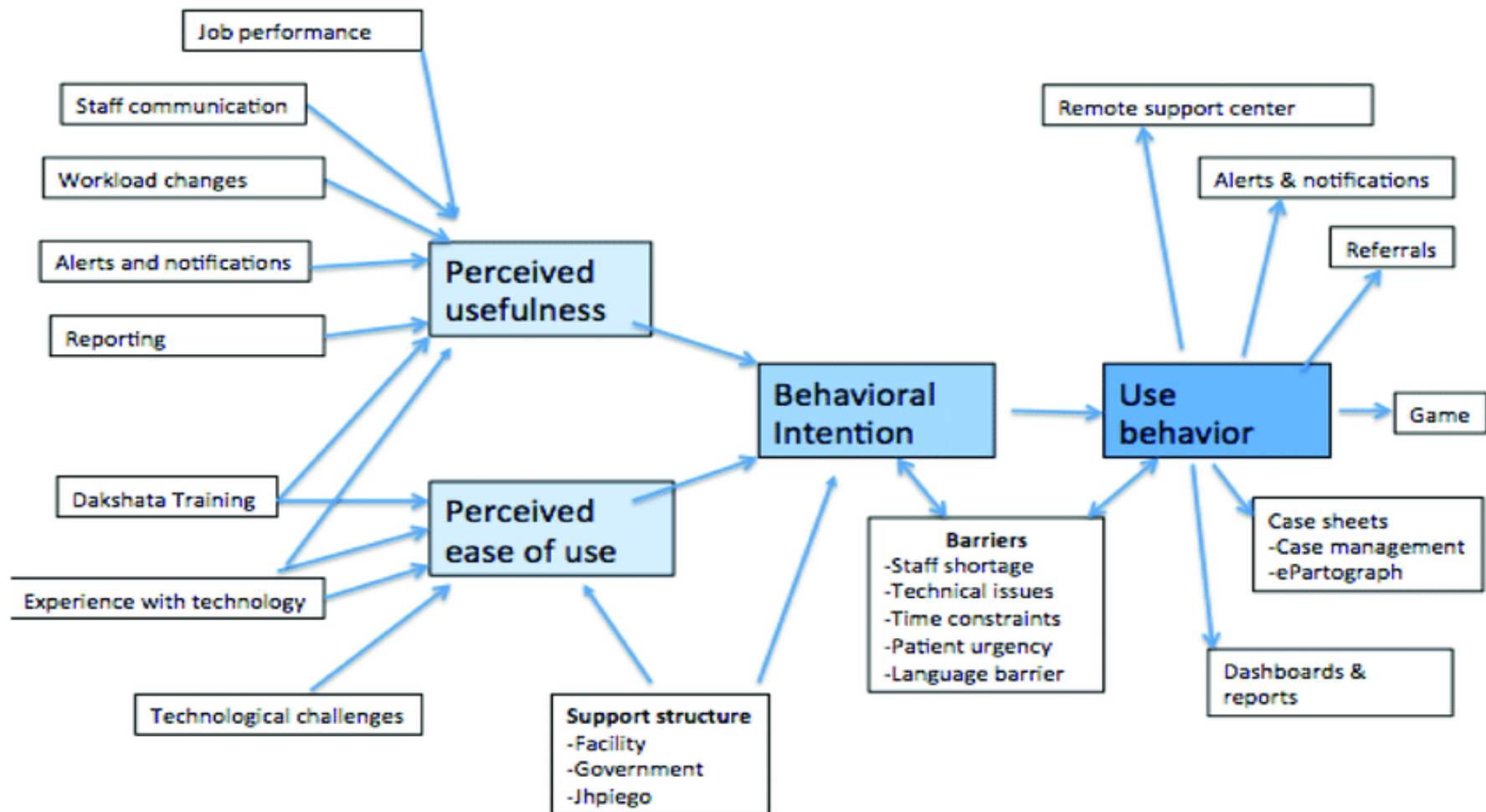
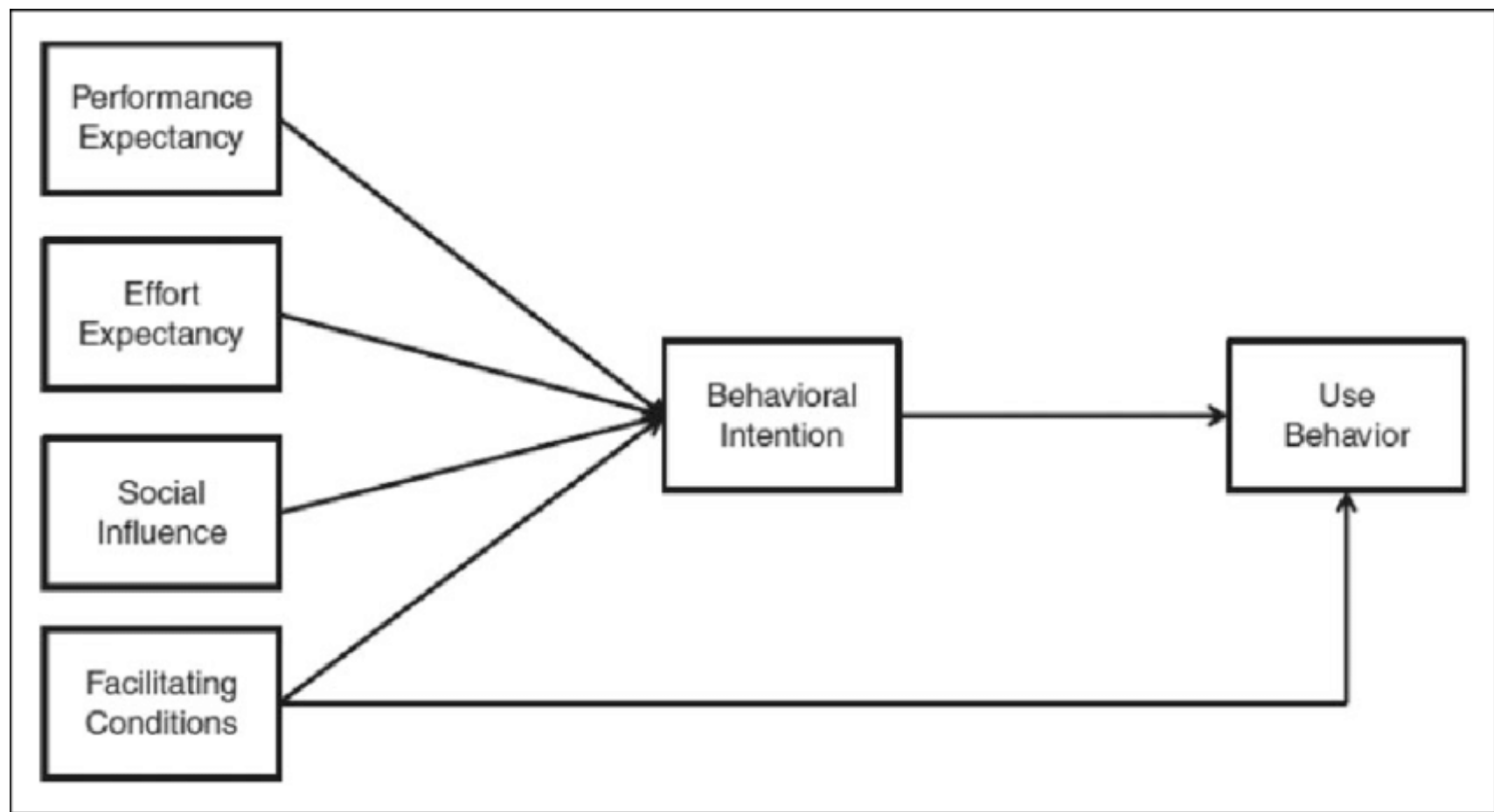


FIGURE 2
PATH COEFFICIENT RESULTS





Performance

Effort Expectancy

Social Influence

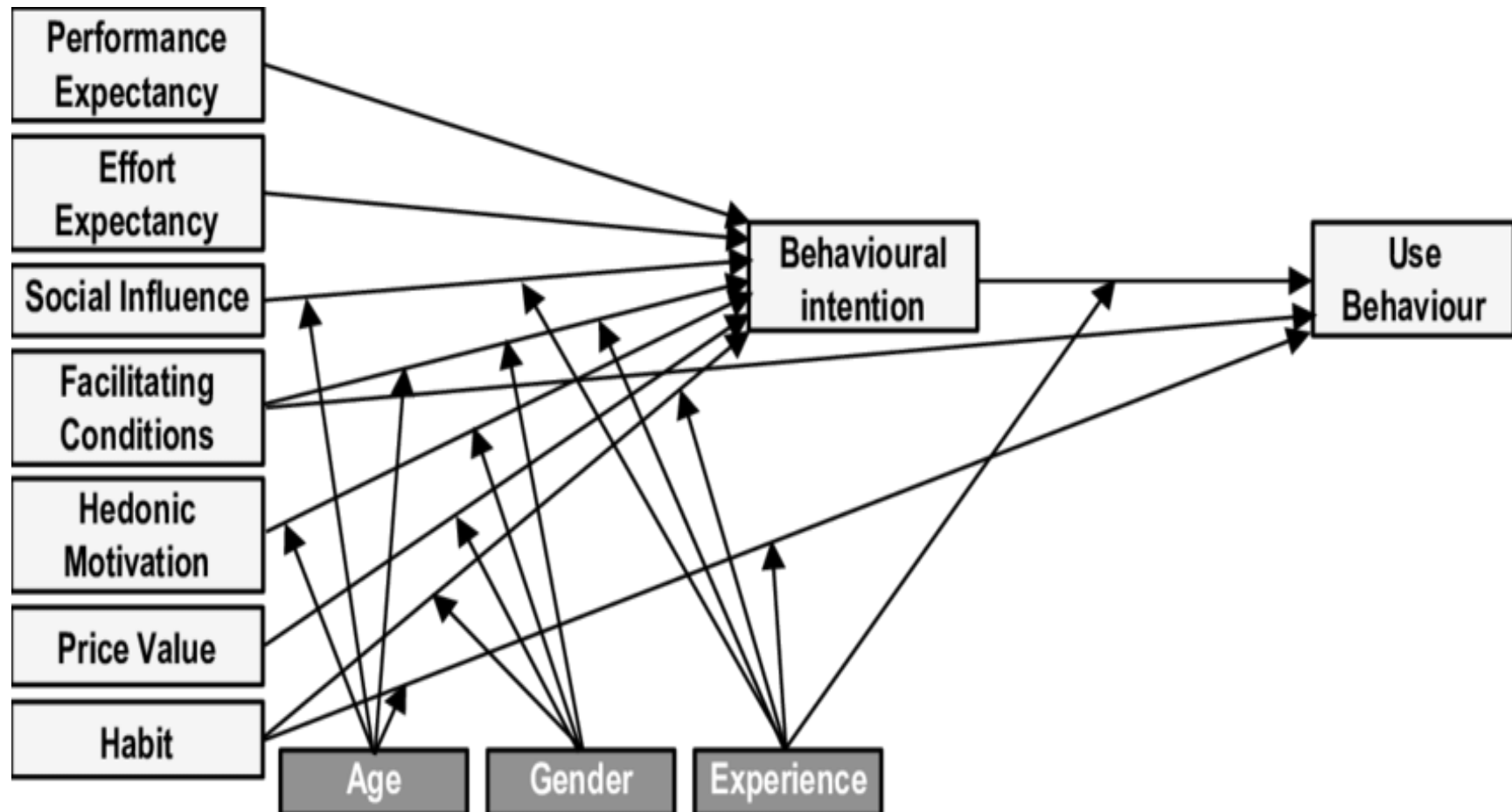
Facilitating Condition

Hedonic Motivation

Price Value

Habit

Behavioral Intention



Hedonic motivation

Enjoyment and fun derived from using the technology. Captures intrinsic motivation, particularly important in entertainment, gaming, and social platforms.

Price value

Consumer's cognitive tradeoff between the perceived benefits and the monetary cost. Critical for freemium, subscription, and mobile app adoption.

Habit

Extent to which using the technology has become automatic from past experience. Strongest predictor in mature technology contexts — habit inertia explains lock-in.

Key result: Habit ($\beta = .49$), Social Influence ($\beta = .54$), and Performance Expectancy ($\beta = .67$) dominate in mature markets. Effort Expectancy ($\approx$ PEOU) weakens to near-insignificance as technology normalises.

03

Case 1: EHR Adoption in US Hospitals

Venkatesh & Morris (2000) · TAM2 · N=342

Electronic health records — TAM2 applied (mandatory vs voluntary)

Case

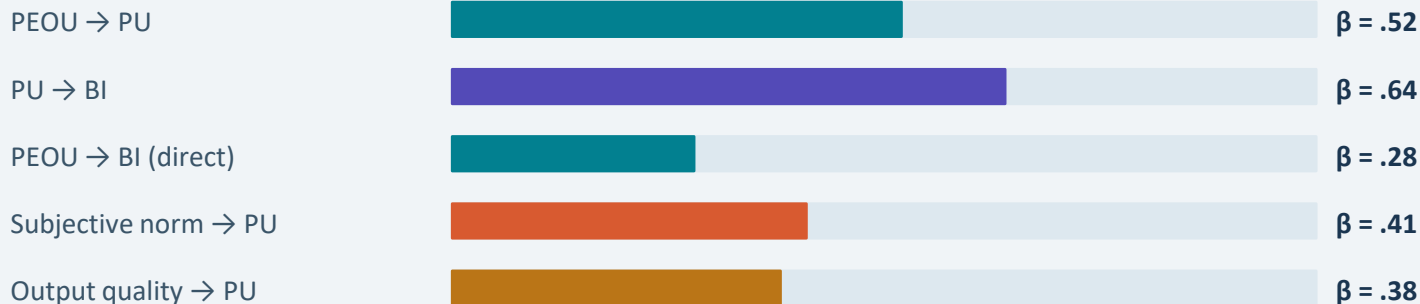
Study design

Longitudinal (pre-adoption T1, post T2 +3 months). 342 nurses & physicians across 6 US hospitals. Compared mandatory vs voluntary EHR implementation groups. PLS-SEM structural equation modelling.

TAM2 extension — what was added

Social influence (subjective norm, image) and cognitive instrumental constructs (output quality, job relevance, result demonstrability) as antecedents to PU. Gender as moderator.

Path coefficients (β) — mandatory use group



Key insight: Social influence (subjective norm) only activated under mandatory conditions. In voluntary groups, the path was non-significant.
Gender moderated: women weighted PEOU more; men weighted PU. R^2 for BI = 61%.

04

Case 2: Mobile Commerce in South Korea

Chong et al. (2012) · TAM + Trust · N=291

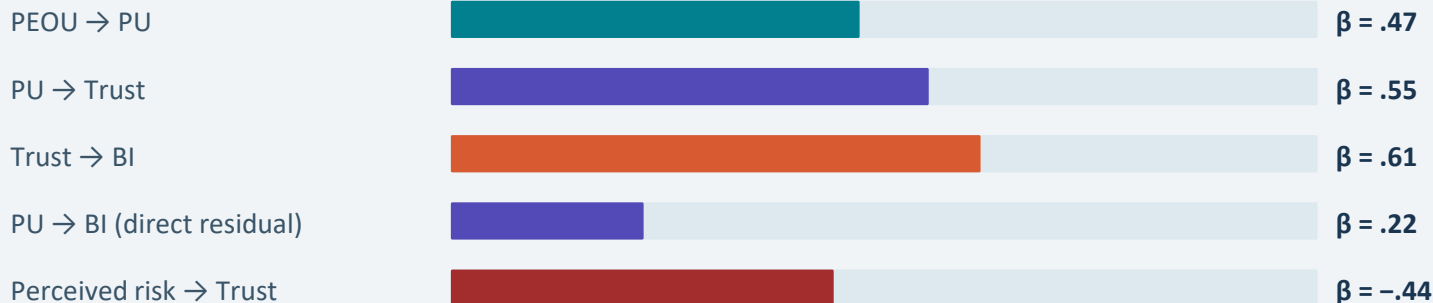
Study design & context

Cross-sectional survey, online panel. Young adults using mobile shopping apps. Korea Hofstede UAI = 85 (high uncertainty avoidance). Trust added as mediator between PU/PEOU and BI. CB-SEM AMOS; CFI = .96, RMSEA = .05.

Key extension — trust mediation

In high uncertainty-avoidance cultures, trust mediates the PU → BI path. Security concerns and perceived privacy risk suppress PU through trust. Full vs partial mediation tested via bootstrapping.

Path coefficients (β)



Key insight: Trust FULLY mediated PU → BI. Without trust, PU's direct path dropped to non-significant. Perceived risk ($\beta = -.44$) was the strongest single predictor. Standard TAM under-performs in high UAI markets without trust constructs.

05

Case 3: M-Learning in Lebanon & Jordan

Tarhini et al. (2017) · TAM3 · N=527

Mobile learning — TAM3 full antecedent model in MENA higher education

Case

Study design

Two-country comparative study (Lebanon & Jordan). University students using LMS / m-learning platforms. Full TAM3 antecedent model including individual differences & system characteristics. Multi-group SEM tests cross-cultural invariance.

TAM3 extension — antecedents of PEOU

Individual differences: computer anxiety (–), computer self-efficacy (+). System characteristics: perceived enjoyment (+), objective usability (+). These predict PEOU → which predicts PU → BI. Tests whether TAM holds in collectivist, high power-distance contexts.

Path coefficients (β)



Key insight: Anxiety reduction > feature richness. Self-efficacy ($\beta = .58$) dominated. Instructor endorsement stronger in Jordan ($\beta = .44$) vs Lebanon ($\beta = .31$) — consistent with Jordan's higher PDI (70 vs 50). TAM3 largely cross-culturally invariant.

06

Case 4: Mobile Banking in China

Zhou et al. (2020) · UTAUT2 · N=684

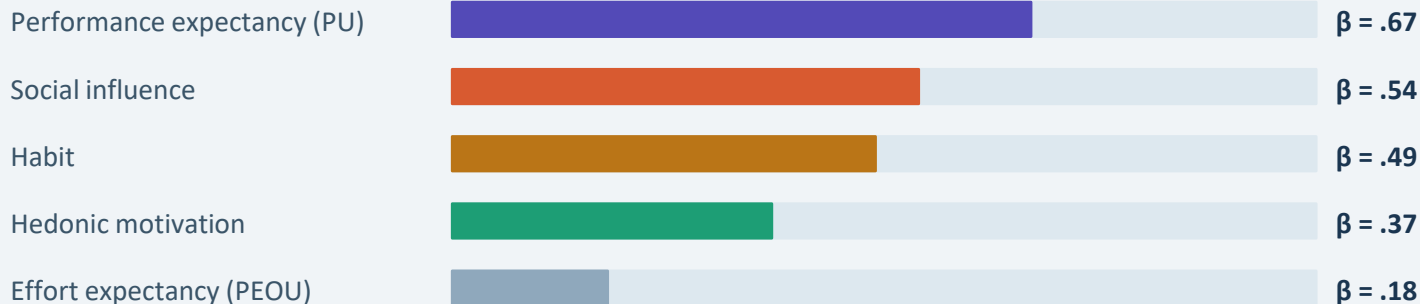
Study design

Cross-sectional online survey, urban Shanghai & Beijing. WeChat Pay and Alipay mobile banking features. UTAUT2 tested: adds Hedonic Motivation, Habit, and Price Value to base UTAUT. PLS-SEM; $R^2 = 74\%$ for BI.

Why UTAUT2 fits China

China Hofstede IDV = 20 (highly collectivist). WeChat's social graph embeds financial transactions in social context. Habit formation is accelerated by super-app ecosystem. Price Value relevant given competitive zero-fee environment.

Path coefficients (β)



Key insight: PEOU barely significant ($\beta = .18$) in mature super-app ecosystem. Social Influence ($\beta = .54$) confirms collectivist platform embeddedness. Habit ($\beta = .49$) signals lock-in: once habitual, continuous PEOU improvement becomes irrelevant.

07

Case 5: AI Diagnostics in Korean Hospitals

Kim & Park (2023) · TAM + AI Anxiety · N=412

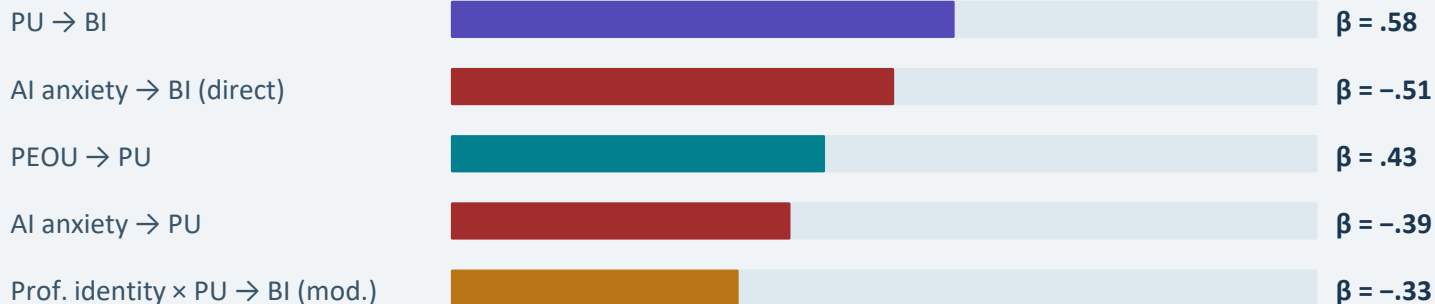
Study design

412 radiologists & internists across 8 Korean tertiary hospitals. AI diagnostic imaging (CT/MRI analysis). New construct: AI-specific anxiety (job replacement fear) — distinct from general computer anxiety. CB-SEM; bootstrapped mediation.

Novel extension — AI anxiety construct

AI anxiety = fear that AI will replace professional judgment or employment. Professional identity moderates PU → BI: high identity specialists resist adoption even when PU is objectively high. Tests framing effect: 'co-pilot' vs 'replacement'.

Path coefficients (β)



Key insight: AI anxiety ($\beta = -.51$) nearly matched PU's positive path ($\beta = .58$) — standard TAM over-predicts AI adoption. Framing AI as 'co-pilot' (augmentation) vs 'replacement' in experiment significantly reduced anxiety. Professional identity is a critical moderator.

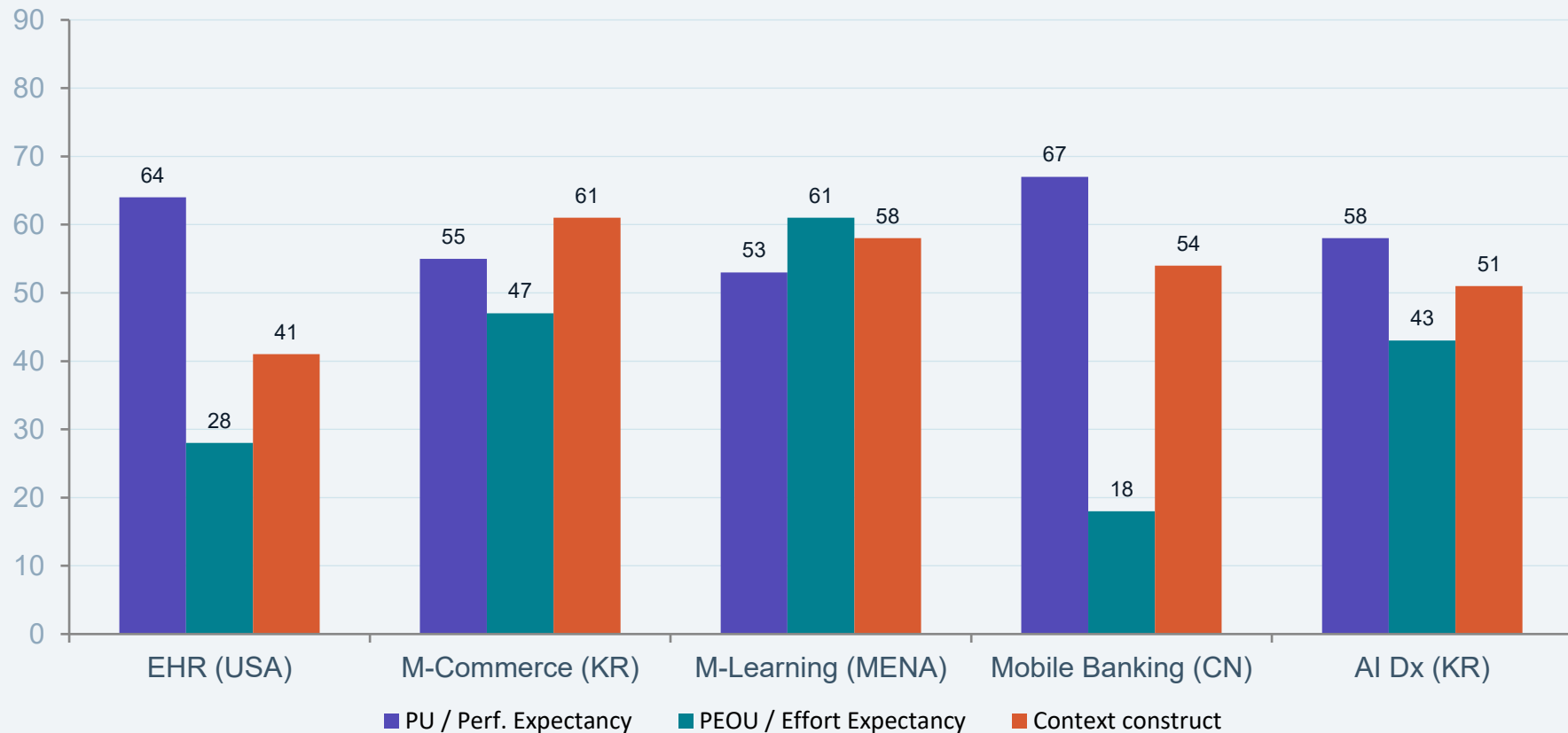
08

Synthesis & Critique

Cross-study patterns, cultural limits & research agenda

Cross-case β comparison — PU vs PEOU vs context constructs

Synthesis



Context construct = Trust (KR), Self-efficacy (MENA), Social Influence (CN), AI Anxiety magnitude (KR). Bars show absolute β values.

Positive-valence assumption

TAM assumes users evaluate technology along usefulness and ease — both positive dimensions. AI anxiety, ethical concerns, and privacy fear are negative-valence constructs that override PU. AI adoption research requires a fundamentally different model.

PEOU diminishing returns

In mature technology ecosystems (WeChat, iOS), PEOU becomes near-irrelevant ($\beta = .18$). TAM was designed for new system adoption; it loses power as technology normalises and habit takes over.

Cultural non-invariance

Standard TAM significantly under-estimates trust and social influence in high UAI / collectivist cultures. Cross-cultural replication without cultural extension leads to incorrect predictions and misguided UX strategy.

Voluntary vs mandatory use

Social influence and subjective norms only activate under mandatory conditions (Case 1). TAM does not adequately distinguish these contexts in its base specification — a critical gap for enterprise IT deployment.

Suggested research directions:

- How does AI anxiety differ from general computer anxiety, and can a validated scale be developed for healthcare AI adoption?
- Does UTAUT2 hold across East Asian cultures (Korea, Japan, China) or do collectivism and face-consciousness require culture-specific constructs?
- How does habit formation interact with switching costs in super-app ecosystems? When does habit lock-in become a monopoly-enabling barrier?
- Extend TAM to AI-generated content platforms (LLMs, generative AI): what constructs capture trust in AI output quality vs trust in the vendor?
- Are TAM β -paths stable across time, or do they shift as technology matures? Longitudinal multi-wave studies across the full adoption lifecycle are scarce.