

Exercise 4

Economics Basics II

Mobile Business I (WS 2024/25)

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- Exercise 1: L11 – Market Overview of Mobile OSs and Security Aspects
- Exercise 2: L12 – Mobile Trusted Devices
- Exercise 3: L13 – Acceptance and Success Factors in Mobile Business

- a) What are the advantages and disadvantages of mobile OSs unavailable to other device manufacturers?

- ***Advantage:*** Tend to be not as much affected by malware compared to operating systems available to many external manufacturers
- ***Disadvantage:*** Less flexible, as 3rd-party software cannot be easily installed and executed
- Later, more and more platforms switched to more open and interoperable operating systems (e.g. Android).

L11 – Market Overview of Mobile OSs and Security Aspects

- b) What are the potential threats for users when it comes to using mobile apps?

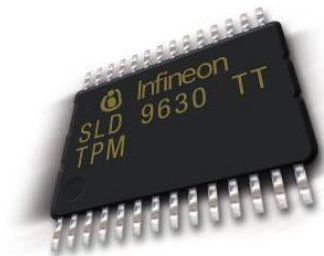
- Many mobile OSs allow the execution of 3rd-party software:
 - Malware can be executed on mobile operating systems, either intentionally or by security leaks inside the mobile operating system (exploits).
- Possible threats for the user are:
 - Device malfunction
 - Loss of data (malware erasing data, obtaining personal information)
 - Loss of money (e.g. malware draining bank accounts)
 - Shorter battery runtime (more processing/resource usage)

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a) What is the Trusted Platform Module (TPM)?

Trusted Platform Module (TPM)

- The TPM is a chip to make computers more secure as a part of the TCG specification.
- It is like a hard coded smartcard with the big difference that it is not bound to a concrete user, but to a system (e.g. a PC).
- **Other usages:** PDAs, mobile devices, and consumer electronics.
- “Passive” chip, can neither influence the booting process nor the operation directly
- Has a unique identifier and so serves for the identification of the system.



b) How can mobile device misuse be prevented?

- Most mobile devices provide device access protection via PIN, password, 2FA input.
- Many mobile users don't use this functionality appropriately (inconvenience).
- Mobile devices could provide protection mechanisms such as
 - strong user authentication,
 - strong user authorisation,
 - data access management,
 - data encryption.



- Exercise 1: L11 – Market Overview of Mobile OSs and Security Aspects
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- a) Which factors are important for acceptance and success in M-Business?
Why it is important to understand these factors?

- ***Which factors are important for acceptance and success in M-Business?***
 - Understanding and building customer trust
 - Academic technology acceptance factors: ease of use, usefulness, network effects, service quality ..
 - Diffusion of M-Business applications and services

- ***... and why it is important to understand these factors?***
 - Need for understanding the customers' choices for using/not using M-Business applications and services and
 - to tailor such services to their actual needs.



[RistKoivuKest2005]
[NohiraLeestm2001]

- b) Define the term ‘trust’. Discuss the main characteristics and parties in a trust relationship.

- Trust:

“A state involving confident positive expectations about another’s motives with respect to oneself in situations entailing risk”.

- The definition highlights three characteristics of trust:

1. Trust relationships involves two parties: *trustor* & *trustee*.
2. Trust involves uncertainty and risk.
3. The trustor has faith in the trustee’s honesty and believes the trustee will not betray him.

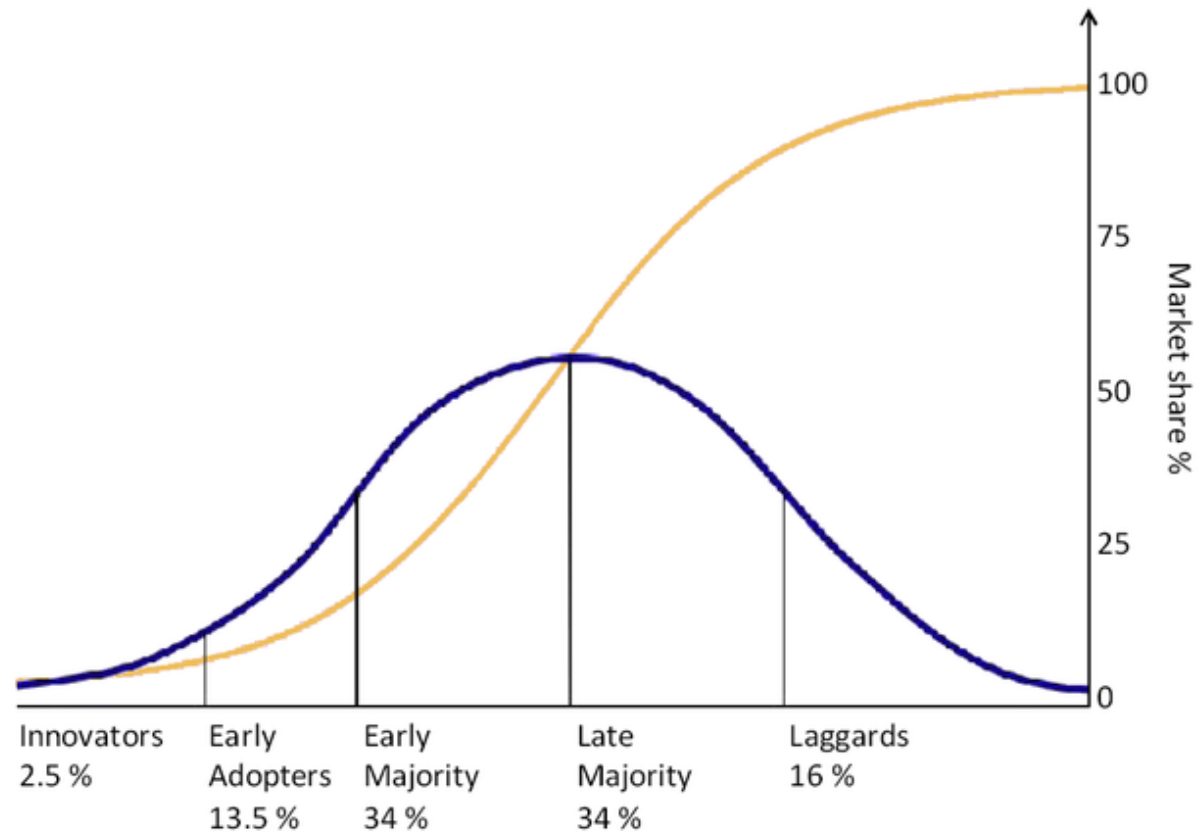
[BoonHolmes1991]

c) Distinguish the terms ‘diffusion’ and ‘adoption’.

- ***Diffusion*** is the process by which an innovation is ***accepted by a social system, e.g. the market.***
- The ***rate of diffusion*** is the speed of the new idea spreading from one consumer to the next.
- ***Adoption*** is similar to diffusion except that it deals with the ***psychological processes*** an individual goes through, rather than an aggregate market process.

d) Name the five categories of adopters.

- Adopters can be categorised in 5 different groups:
 1. Innovators
 2. Early adopters
 3. Early majority
 4. Late majority
 5. Laggards



[Rogers2003]

- ***Innovators (2,5%):***

- ***Characteristics:*** Venturesome, educated, multiple info sources, greater propensity to take risk
- ➔ Has the ability to understand and apply complex technical knowledge and can cope with a high level of uncertainty of an innovation.
- ➔ The innovator is a catalyst who brings about the use and adoption of new ideas.

- ***Early adopters (13,5%):***

- ***Characteristics:*** Social leaders, popular, educated
- ➔ Other members of the group look to these individuals for advice and knowledge about the innovation.

[Rogers2003]

- **Early majority (34,0%):**
 - **Characteristics:** Deliberate, many informal social contacts
 - ➔ Tend to adopt the innovation just prior to time the average individual adopts it (link between early adopters and later majority).

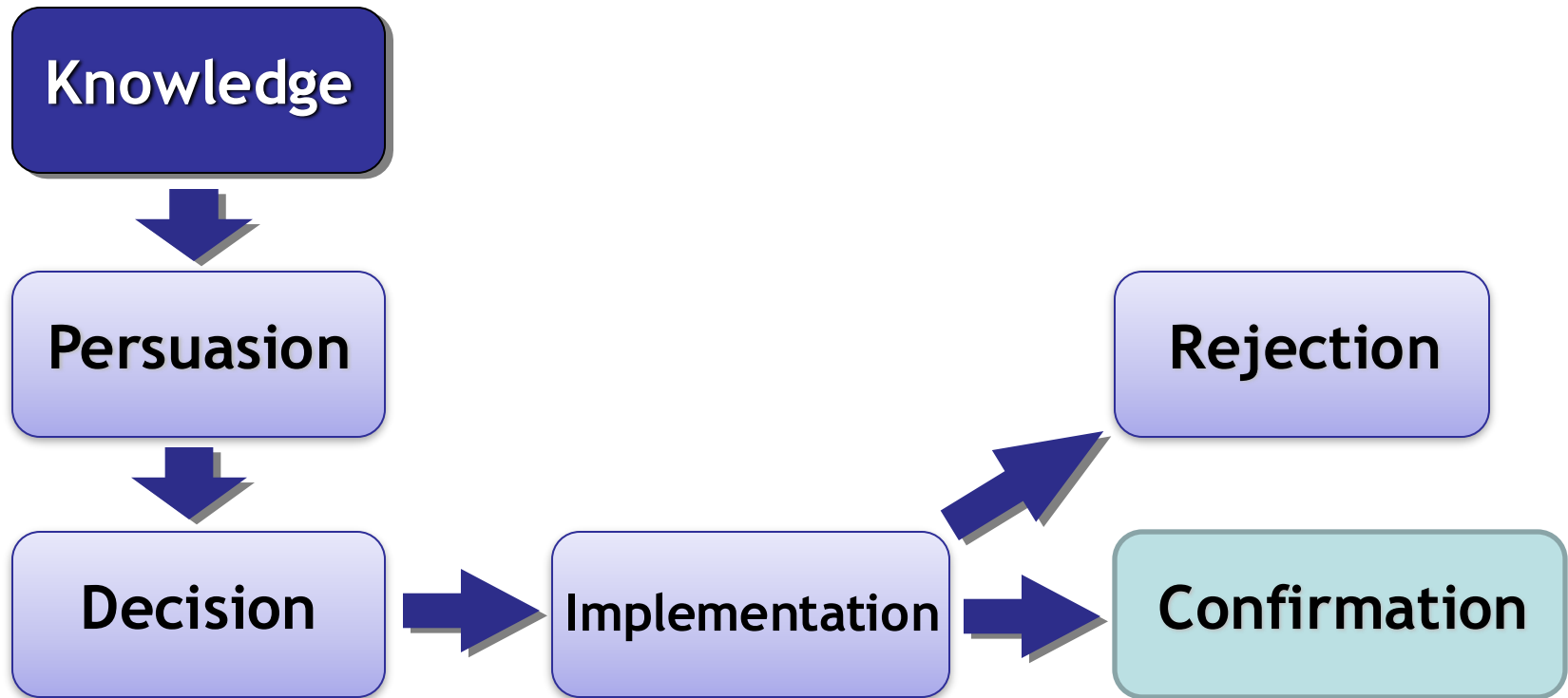
- **Late majority (34,0)%:**
 - **Characteristics:** Sceptical, traditional, lower socio-economic status
 - ➔ Acceptance comes after the average person accepts

- **Laggards (16,0%):**
 - **Characteristics:** Neighbours and friends are main info sources, fear of debt
 - ➔ Laggards are those who are consistent or even adamant in resistance to change.

[Rogers2003]

e) Describe the five stage model for the diffusion of innovation.

Diffusion of Innovations Stages of Adoption



[Rogers2003]

- The adoption of an innovation includes the following stages:
 1. **Knowledge:** Learning about the existence and function of the innovation
 2. **Persuasion:** Becoming convinced of the value of the innovation
 3. **Decision:** Committing to the adoption of the innovation
 4. **Implementation:** Putting it to use
 5. **Confirmation:** The ultimate acceptance (or rejection) of the innovation

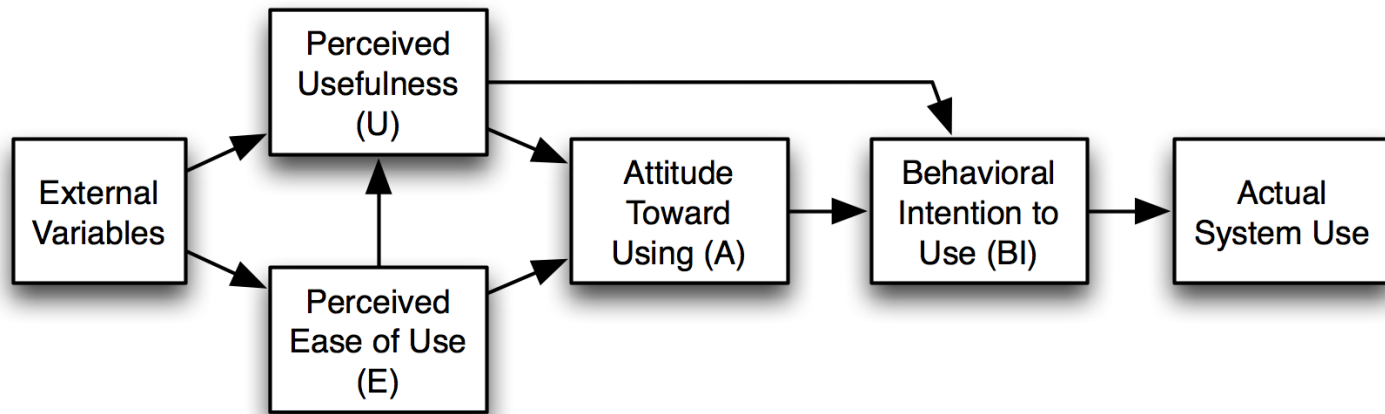
[Rogers2003]

f) Identify two more technology adoption models in a scientific database of your choice. Why and how do these models differ from the TAM, outlined in the lecture?

▪ Scientific databases:

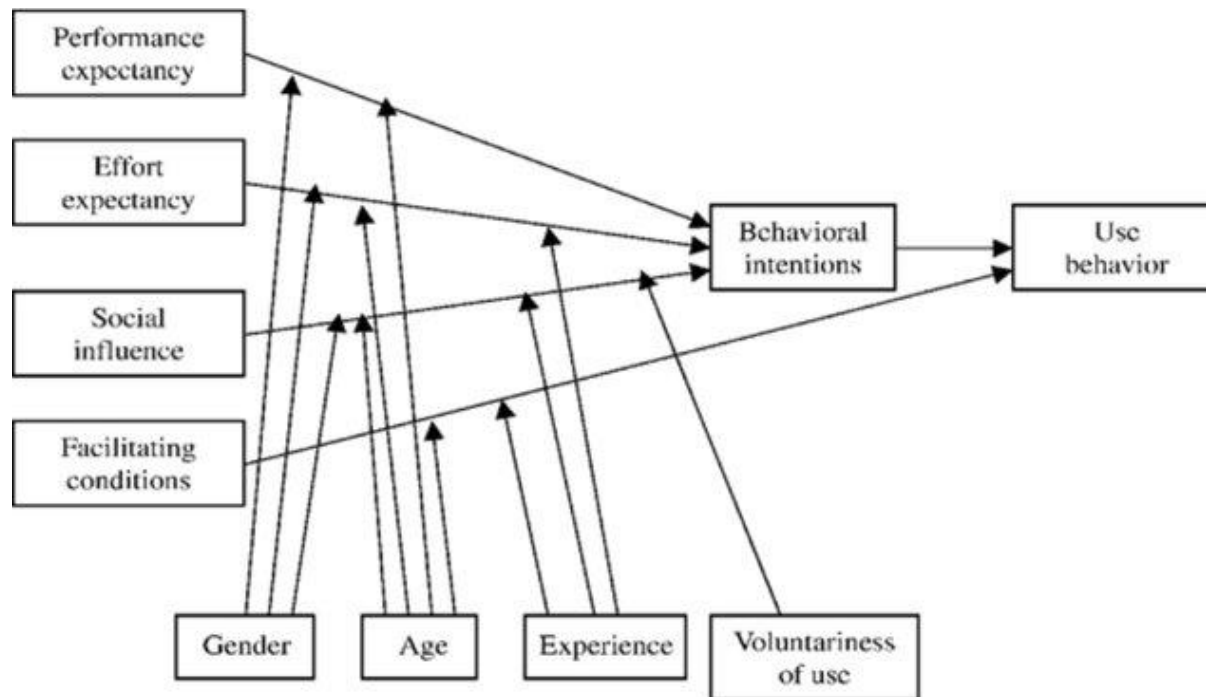
- Google Scholar
- [IEEE Access](#) (Informatics focus)
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- [SSRN](#) (social sciences)
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The original technology acceptance model (TAM)



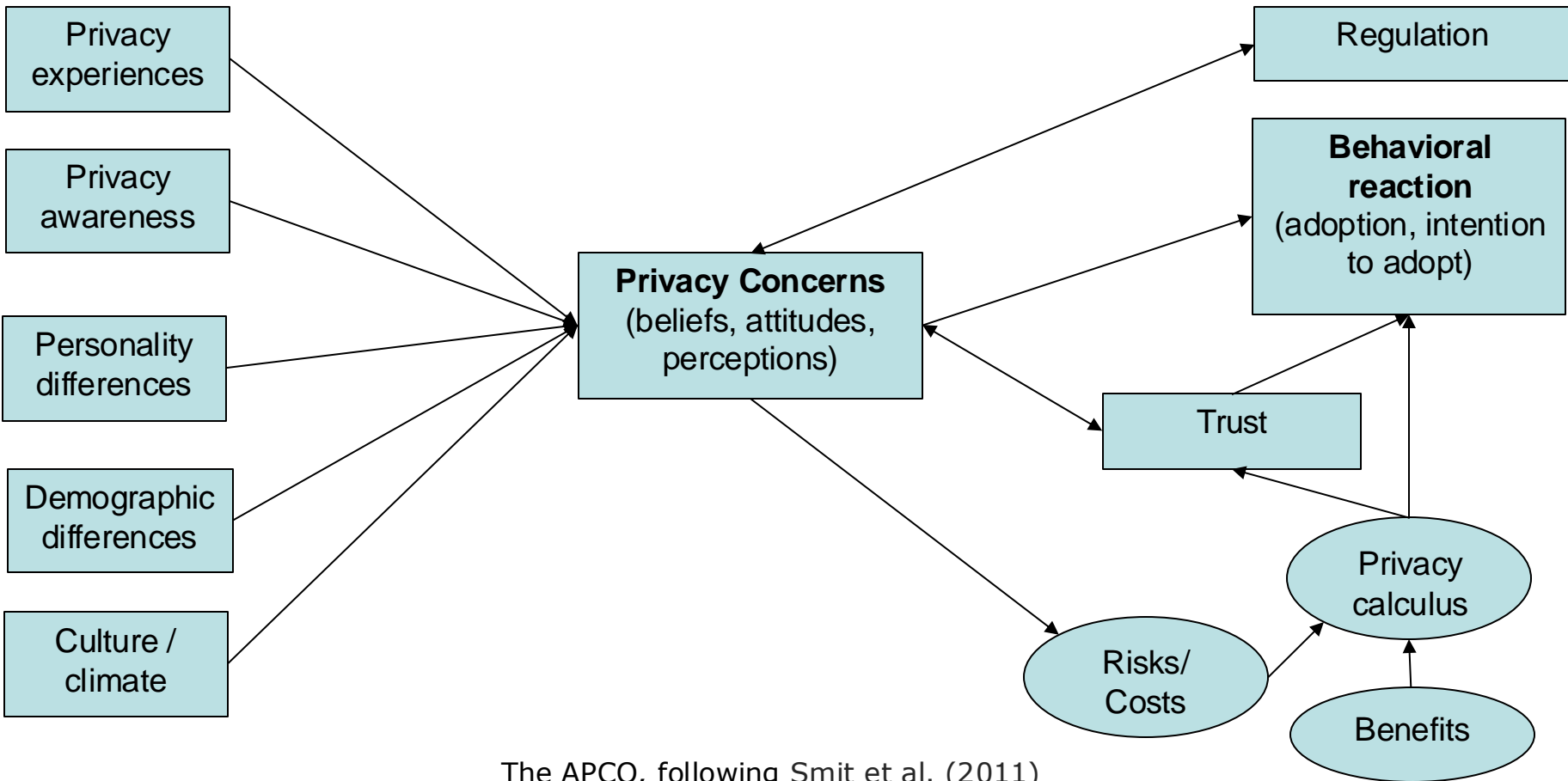
The TAM, following Davis (1989)

1. Unified Theory of Acceptance and Use of Technology (UTAUT)



The UTAUT, following Venkatesh et al. (2003)

2. Antecedents, Privacy Concerns and Outcomes - Model



The APCO, following Smit et al. (2011)

- How do they differ?
 - Other factors
 - Other relationships

- Why do they exist? Why do they differ?
 - Objective to explain usage behavior as best as possible
→ to account for the largest variance possible → High R^2
 - New studies, with new technologies, may uncover new factors and relationships
 - Through review of existing literature, factors get consolidated and new factors and relationships arise, e.g. “Perceived Usefulness (TAM) → “Performance Expectancy (UTAUT)

- What is academia using such models for?
 - Analyze effect significance and size using quantitative survey data using appropriate methods, e.g. PLS-SEM (partial least squares structural equation modeling) and SmartPLS.

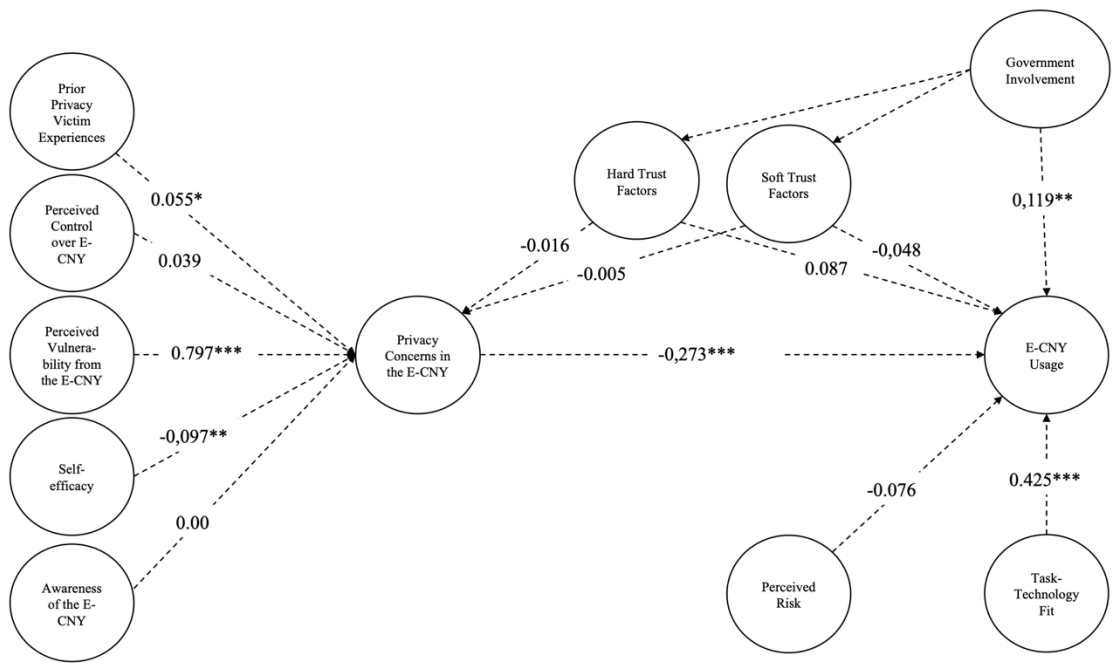


Figure 1. Final research model and path coefficients (Statistical significance: *0.05, **0.01, ***0.001).

Example: Adoption of the digital Yuan for Chinese survey respondents

- What could the results then be used for?
 - Verify hypothesized models on their applicability (theoretical)
 - Derive answers on which factors are important to drive adoption, and which are not (practical contribution).

Total Effect	Effect Size	P-Value
Perceived risk → Usage of e-CNY	-0.076	0.149
Awareness of the e-CNY → Usage of e-CNY	0.000	1.000
Hard factor → Usage of e-CNY	0.092	0.066
Perceived vulnerability → Usage of e-CNY	-0.218	0.000
Privacy concerns in the e-CNY → Usage of e-CNY	-0.273	0.000
Privacy victim experience → Usage of e-CNY	-0.015	0.035
Soft factor → Usage of e-CNY	-0.047	0.373
Self-efficacy → Usage of e-CNY	0.027	0.008
Task-Technology Fit → Usage of e-CNY	0.425	0.000
Government Involvement → Usage of e-CNY	0.119	0.002

This set of slides is based upon the following Economic Basics lectures:

- **Lecture 11:** Market Overview of Mobile OSs and Security Aspects
- **Lecture 12:** Mobile Trusted Devices
- **Lecture 13:** Acceptance and Success Factors in Mobile Business

Models

- Smith, H. J., Dinev, T., & Xu, H. (2011). Information privacy research: an interdisciplinary review. *MIS quarterly*, 989-1015.
- Venkatesh, Viswanath; Morris, Michael G.; Davis, Gordon B.; Davis, Fred D. (2003). "User Acceptance of Information Technology: Toward a Unified View". *MIS Quarterly*. **27** (3): 425-478. [doi:10.2307/30036540](https://doi.org/10.2307/30036540). [JSTOR 30036540](https://www.jstor.org/stable/30036540). [S2CID 14435677](https://www.s2cid.com/14435677).

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