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## Toward Understanding PU and PEOU of Technology Acceptance Model

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# Toward Understanding PU and PEOU of Technology Acceptance Model

The 6<sup>th</sup> Student Research Symposium

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# ABSTRACT

Technology Acceptance Model (TAM) is considered one of the most popular models used in Information System (IS) research. Fred Davis developed this model as part of his doctoral research at MIT in 1986. Since then this model has been widely used in IS research and other disciplines. Two main components of TAM are Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). This model allowed researchers to plug-in external factors to these two components. Researchers have used a variety of external factors to draw relationships between these two internal factors of TAM model. However, most of the research used these TAM-based internal factors without elaborating actually what makes a system or technology useful. This research makes an attempt to understand those two internal factors based on literature review and a comprehensive exploratory study. The author proposes a set of external factors that are technology focused and have practical value. This work is expected to guide future researchers in using this model with proposed external factors that match the definition of PU and PEOU.

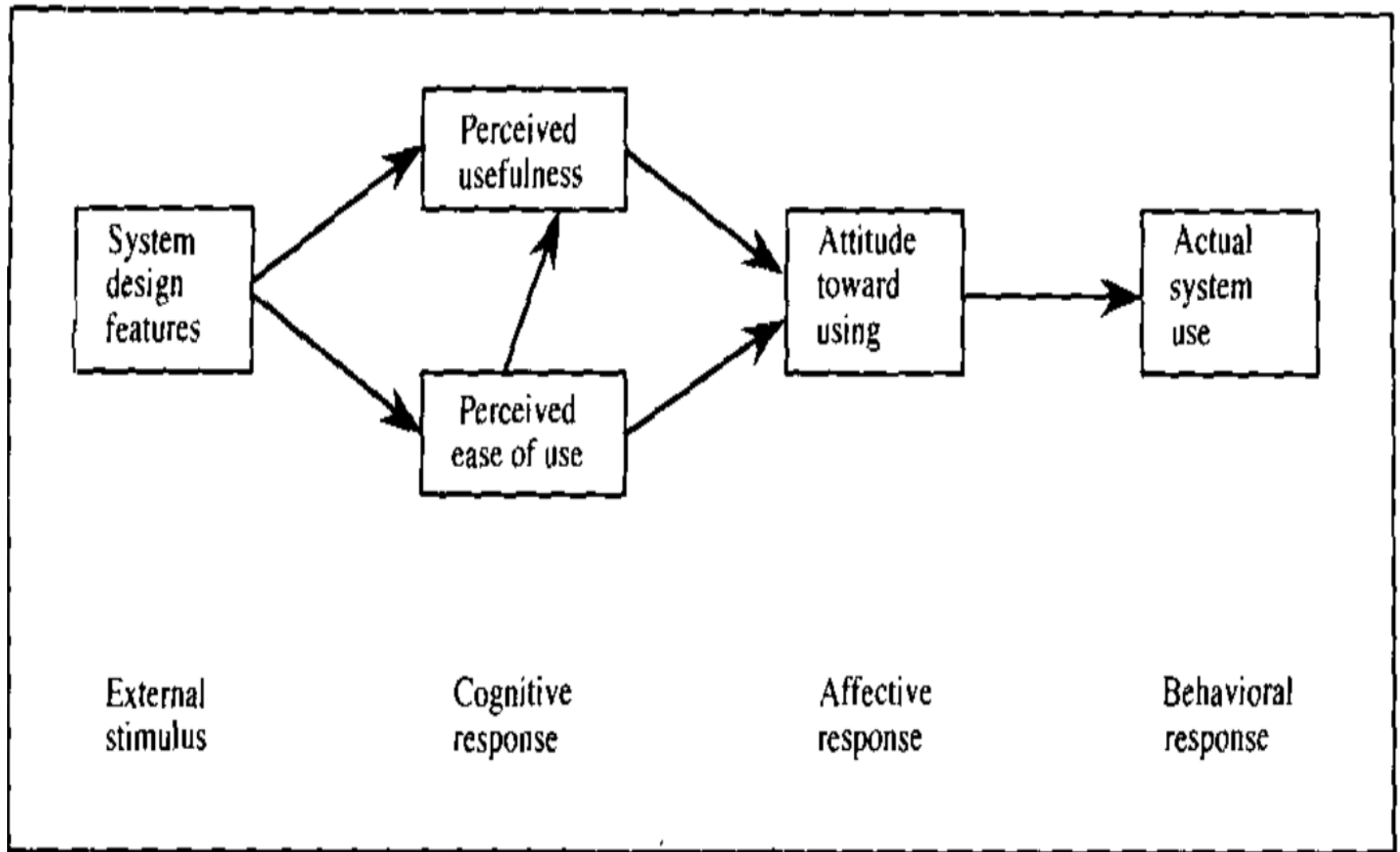
# Overview

- Introduction
- Technology Acceptance Model (TAM)
- Critics of TAM
- Research Question
- Qualitative Studies
- Proposed External Factors and Model
- References

# Introduction

- For any product or technology to be successful user acceptance is important
- When users are presented with a new technology, a number of factors influence their decision about how and when they will use it (Davis, 1993)
- User acceptance has been considered a pivotal factor in determining the success of a system or technology (Dillon and Morris, 1996)

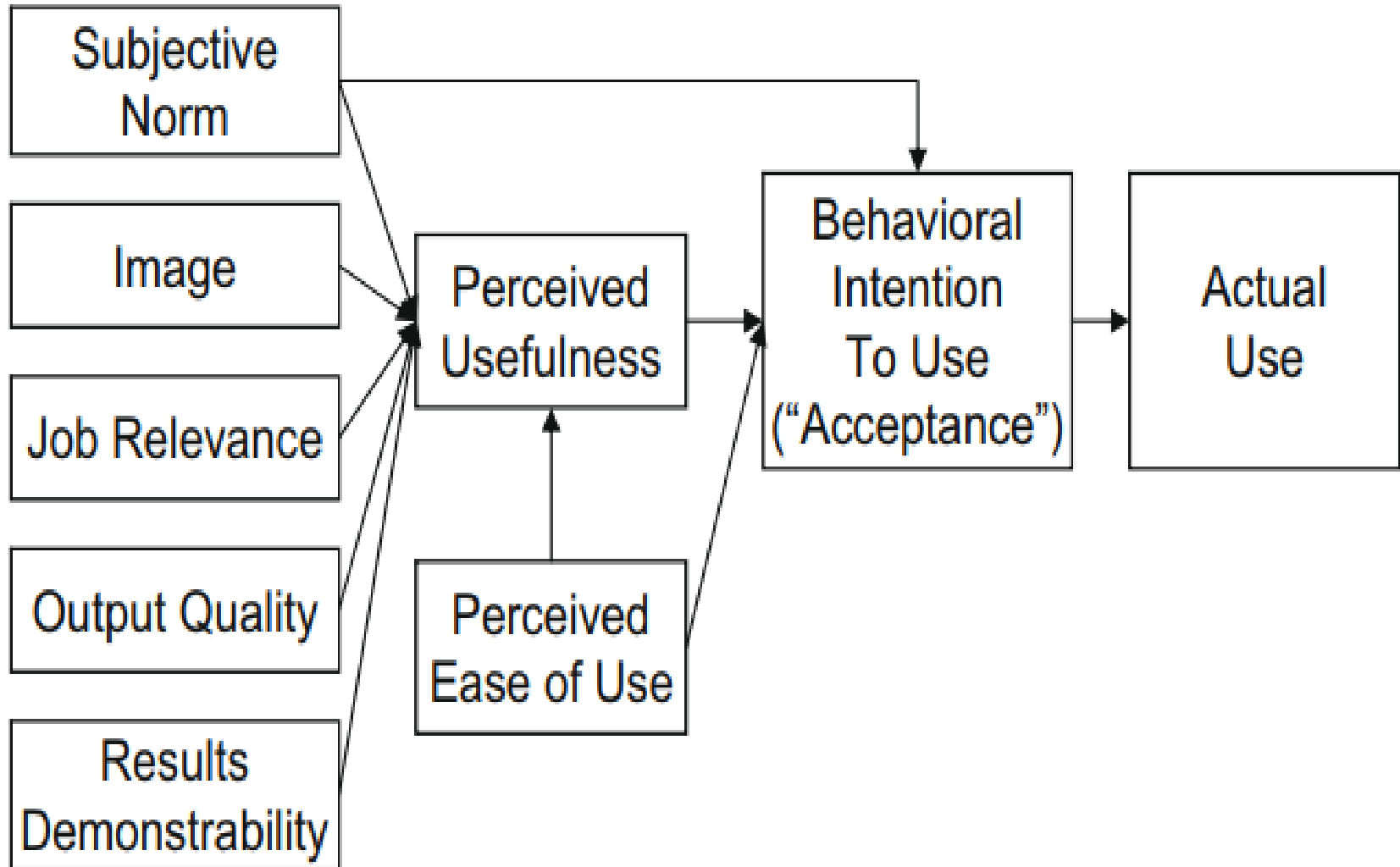
# Tech Acceptance Model (Davis, 1993)



# PU, PEOU

- Perceived Usefulness (PU) is “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1993)
- Perceived Ease of Use (PEOU) is “the degree to which a person believes that using a particular system would be free from effort” (Davis, 1993)

# Tech Acceptance Model 2 (Venkatesh & Davis, 2000)





# Shortcomings, Critics of TAM Research

- TAM's simplicity may not be well-suited by practitioners (Chuttur, 2009)
  - A high-level view that technology must be 'useful' (PU) and 'easy to use' (PEOU) is not enough (Lee et al., 2003)
- "Study after study has reiterated the importance of PU, with very little research effort going into investigating what actually makes a system useful. In other words, PU and PEOU have largely been treated as black boxes that very few have tried to pry open" (Benbasat and Barki, 2007)
- Researchers suggest studies on multi-user systems, group-attitude in acceptance, and complex technologies (Venkatesh, 1999; Lee et al., 2003)
- TAM overlooks factors: cost, structural determinants

# Research Question

- A very fundamental question is what makes a technology useful and easy to use
  - What technological capabilities or characteristics are important in accepting a technology
  - Deeper understanding of PU and PEOU is needed from a technology's practical value standpoint
  - Need to take a look at PU and PEOU from Individual and industrial/ organizational users' context
  - Evidence of use needed for TAM (Dillon and Morris, 1996)

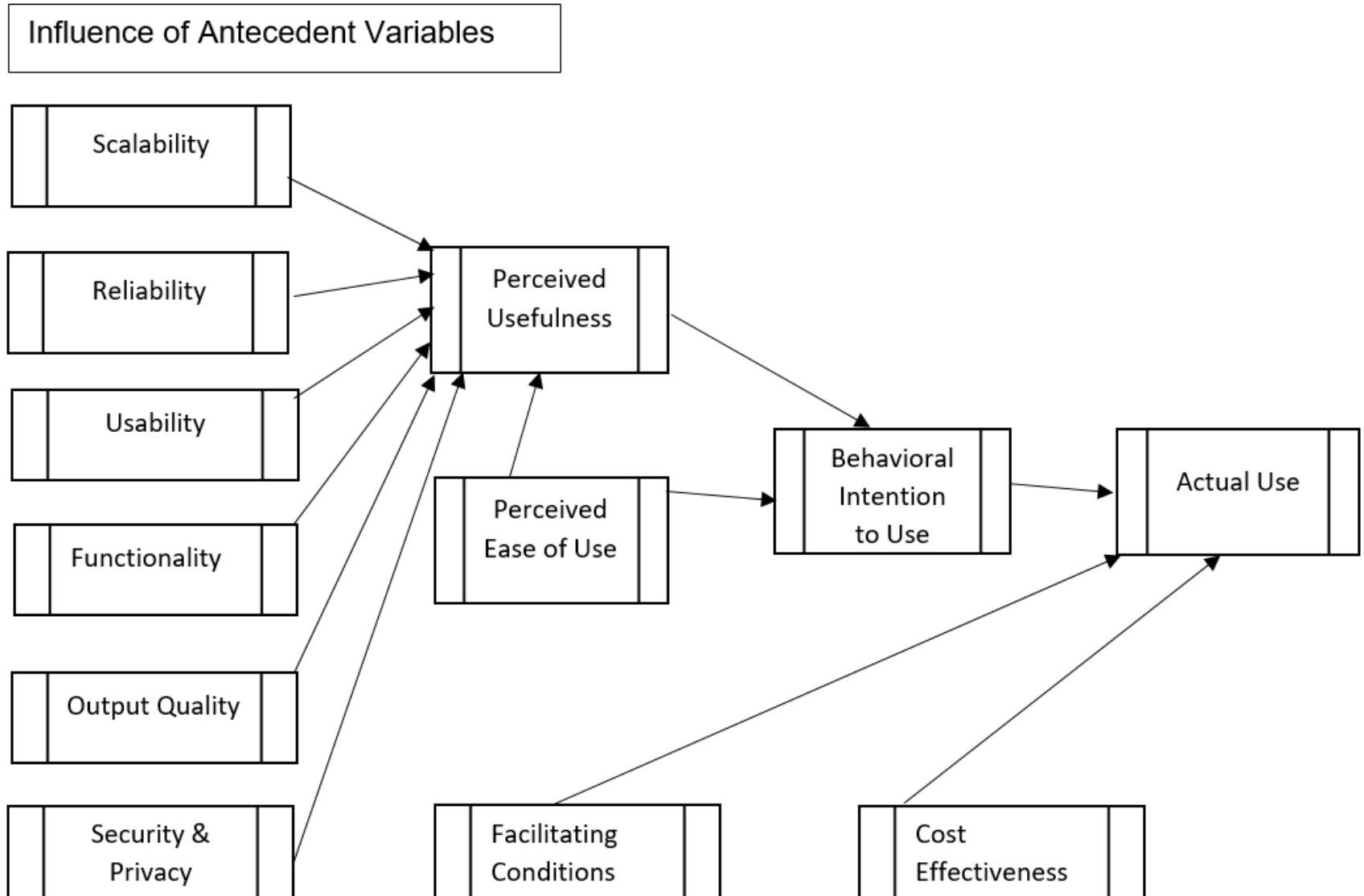
# Defining Perceived Usefulness

- A product, technology or application should solve a problem, fulfill a need or offer something that is useful
- According to Merriam-Webster Dictionary...
  - Usefulness is "the quality of having utility and especially practical worth or applicability"
- Attitude Theory from Psychology
  - Rational for flow of causality from system design features through perceptions to attitude and finally to usage (Ajzen, 1991; Fishbein & Ajzen, 1975)

# Qualitative Studies

- Two user groups are selected from IT organization of a large manufacturing company
- They work in enterprise platform that use varieties of systems, tools and technologies
- Users consist of front-end and back-end levels with three to twenty years of job experience
- A one-hour brainstorming session was conducted with each user group consisting for six to eight people
- The users were asked to come up with eight to ten variables that are important in tech use

# TAM: Proposed External Factors



# External Factors

- Scalability
  - Capability of software and hardware to handle increase of work load in terms of bandwidth and data volume (Rahman, 2016; Sen & Sinha, 2005; Sen & Jacob, 1998)
  - Easily expandable and compatible with new/existing applications in the environment
- Reliability
  - Capability of software and hardware to work smoothly according to specifications. Fast, available and accessible 24x7
  - Robust error handling, monitoring, self-maintaining and healing
- Usability
  - User experience-focused
  - System features are intuitive. System is fast, robust, and will perform its required function for a specific period of time

# External Factors (Cont'd.)

- **Functionality**
  - System is functional, meets or exceeds the functionality required by the user, and allows for achieving efficiency
- **Output Quality**
  - How well the system performs tasks that match job goals (Venkatesh & Davis, 2000)
  - Data quality for better forecast & decision Making
  - Validity of data or system to use for business purposes
- **Security and Privacy** (Mantelero, 2014; Martin, 2015; Tene & Polonetsky, 2013; Viceconti et al., 2015)
  - Security and privacy against intangible harm that something can cause
  - To Keep the data confidential, prevent vulnerability, and avoid security breaches

# External Factors (Cont'd.)

- Facilitating conditions
  - The control beliefs relating to resource factors such as time and money and IT compatibility issues that may constrain usage (Lee et al., 2003; Venkatesh et al., 2003)
  - Vendor support, customer support, internal infrastructure support in an organization
- Cost-Effectiveness
  - Capability of a technology that is effective and productive enough in relation to its costs (Premkumar & Potter, 1995; Phan & Daim, 2011; Russom, 2013; Hartmann et al., 2014; Rahman & Aldhaban, 2015)



# Conclusion

- TAM factors in terms of PU and PEOU are identified with rigor, relevance, and practical effectiveness
- TAM factors are identified that are technology focused
- TAM factors identified from economic and infrastructural support perspectives
- Perceived usefulness is identified as a subset of PU
- TAM proposed with universal external factors
- Hypotheses and measurement scales will be developed as part of test and validation of the model

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