INTRODUCTION

- Home Energy Management System (HEMS) refers to any hardware and/or software system that can monitor and provide feedback about a home’s energy usage, and enable advanced control of energy-using devices and systems in the home.
- HEMS can show daily electricity consumption, help users reach the goal of energy saving by managing home appliances, and reduce the amount of carbon emissions.
- The purpose of this study is to research the significance of demographic variables and social-psychological variables in affecting one’s intention to use HEMS.
- The social-psychological variables were derived from the technology acceptance model (TAM) and the theory of planned behavior (TPB); additional variables were also included.

METHOD

Survey Design
- A 10-minute online survey was given to the residents in New York and Tokyo.
- Survey topics included basic questions (age, gender, etc.), background of HEMS, additional services, attitudes towards HEMS, household and energy habits, and demographics.

Participants
- A total of 2544 people participated, with 1228 (48.3%) from New York and 1316 (51.7%) from Tokyo.
- 611 females (49.8%) and 617 males (50.2%) from New York participated; 669 females (50.8%) and 647 males (49.2%) from Tokyo participated.

DATA ANALYSIS

- One-Way ANOVA
- Intention to Use HEMS in both cities
- Intention to Use HEMS with Additional Services
- Intention (Gender x Location)
- Intention (Age x Location)

APPLICATION

- Smart Home Management System (HEMS): A Useful Tool for the Future
- HEMS can serve many functions including:
  - Providing extra security to your home.
  - Providing tele-medical services.
  - Saving money on electricity.
  - Adopting an environmentally-friendly lifestyle.
- Easy to use
- You can access HEMS on your smartphone, quickly and efficiently.
- You have the power to control how much money you spend on your electricity.
- Money Saved > Money Spent
  - The money you will save while using HEMS outweighs the money you will spend on HEMS.

CONCLUSION

1. Age → Intention
   Younger people are more likely to use HEMS in New York. Age did not affect the intention to use HEMS in Tokyo.

2. Income → Intention
   People with higher levels of income are more likely to utilize HEMS in New York.

3. Gender → Intention
   Males are more likely to use HEMS in New York. Females are more likely to use HEMS in Tokyo.

4. Out of the variables from TAM, two were significant for NY (Attitudes and Social Norms), and three were significant for Tokyo (Attitudes, Social Norms, and Perceived Behavioral Control).

5. Out of the variables from TAM, two were significant for Tokyo (Perceived Ease of Use and Cost), and one was significant for New York (Usefulness).

6. Additional variables: Dependence was significant for both locations, and habits were significant for New York.

REFERENCES


This work was supported in part by the Engineering Research Center Program of the National Science Foundation and the Department of Energy under NSF Award Number EEC-1041877 and the CURENT Industry Partnership Program.