Intelligent Home Assistant Use in the Home Environment

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Abstract

Individuals increasingly acquire Intelligent Home Assistants (IHAs), with products being offered by some of the largest technology companies in the industry such as Amazon (e.g. Amazon Echo) and Google (e.g. Google Home). Their business model is designed to capitalize on having as much data about customers as possible. These companies do so by providing products that customers will view as providing a benefit that outweighs the cost of giving up this personal information. IHAs work by continuously listening for commands they need to respond to (also known as “wake words” such as Alexa, Computer or other user-defined wake words). As this ecosystem continues to develop, the functionality of IHAs inside the home has grown, increasing benefits to the consumer. In order for this functionality to be provided however, these devices are connected to the cloud and the data they receive is recorded by the provider. The real-time recording of this information and the increased use of IHAs in households raise the question about how invasive families find them to be. However, little empirical research exists on the social uses of these devices and the implications of interactions with them. Therefore, this research explores the role IHAs have on individuals’ perceptions of risk, trust, and privacy using multi-level research to understand how these perceptions influence families’ use of the devices.

IHAs allow information retrieval (e.g. performing Internet searches, weather updates and making restaurant reservations online, via voice-activated assistants such as Alexa for Amazon Echo or Google Assistant for Google Home), sensing and collecting of data from other devices around the home or worn by the occupants (e.g. data from the motion and door sensors or wearable devices such as Android Wear watch), and command and control (e.g. turning on and off connected devices in the home, such as televisions). Generically, audio and multimedia (e.g. images and videos) materials and other data are also collected and stored locally on the IHAs and/or other devices such as mobile devices used to connect to the IHAs. Such data can be used to profile the home occupants. To explore potential issues resulting from this “whole family profiling”, we seek to answer the research questions posed below. In doing so, we hope to provide insight to the research community on the privacy implications that IHA use has on individuals and families.

RQ 1: What factors influence individuals’ use of IHAs?
RQ 2: What role do family-related factors have on individuals’ use of IHAs?

In this paper, we propose utilizing the APCO model to study the multi-level nature of the individual within the family-unit and how privacy concerns interplay with trust and risk perceptions to determine people’s behavioral outcomes of willingness to share information and IHA use. Hierarchical Linear Modeling (HLM) is proposed to test the research model. We expect to contribute to research by demonstrating the role privacy plays at the group (family) level of analysis, as well as how the many nuanced natures of trust influence the behaviors of individuals in the family environment. In particular, it will be interesting to uncover how trust in the ecosystem of the IHA interacts with trust of various members of the family, and how this affects individuals’ vs. families’ usage of the IHA. For practitioners, this research has the potential to inform future developments of IHAs in such a way to overcome any barriers to adoption driven by privacy concerns and issues of trust.