

**User Experience Design to Synchronize  
Government Acquisition Strategy and  
Schedule**  
(Technical Paper)

**Apple's Siri: Surveillance  
in the Modern  
Technological Age**  
(STS Paper)

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On my honor as a University Student, I have neither given nor received  
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## **General Research Problem: IPAs and Evolving User Experience**

*How do intelligent personal assistants shape user experience and impact consumer expectations?*

Intelligent Personal Assistants (IPAs) are continually being integrated into mobile devices and other technological systems we interact with on a daily basis. These assistants influence how we tackle tasks, organize and prioritize commitments, and retrieve desired information. Given the ability of this technology to streamline our daily activities, the market for these devices is projected to grow tremendously in the upcoming years and application of this technology is expanding outside personal use and into business functions. The application of IPAs in business is a topic I will explore further in the technical portion of this paper.

The value IPAs deliver to consumers is twofold; these devices provide a digital experience as well as quick access to a plethora of information. “The Intelligent Personal Assistant could be a mirror and a dictionary to the users at the same time. It both reflects users’ characteristics and enhances the user experience due to the nature of it as a medium.” (Jiang, para. 40). User experience focuses on obtaining a deep understanding of user needs, values, and limitations in order to improve the quality of user interactions with the system without hindering the business’s underlying objectives (“User Experience Basics,” 2014). Innovations to both the user experience and information delivery of IPAs are shaping the way consumers interact with these devices and what they value most from their interactions. An article published by the Harvard Business Review explores the shaping of these devices and predicts that AI assistants establish a sense of trust and loyalty with their consumers that triumphs the offering of any existing marketing technology (Dawar, 2018). With the anticipated growth in this market and

shift towards these devices, my research seeks to understand how users interact with IPAs and how these devices shape their expectations around the experience the technology should deliver. This paper will explore the mutual shaping between consumers and IPA technology by assessing how consumer preferences, interactions, and expectations are shaped by this technology and how this knowledge further impacts the innovation and advertising around IPAs.

## **Streamlining the Government Acquisition Process with a Scheduling App**

*What is the ideal balance between “playfulness” and professionalism in an application designed for business activities?*

My technical capstone project involves wireframing a scheduling app to act much like an IPA for government acquisition personnel. Acquisition personnel are typically tasked with writing a request for proposal (RFP), a document that describes a particular project which then initiates a bidding process where government contractors who are capable of doing the work will participate. The RFP creation process is immensely complex and requires the collaboration and efforts of several individuals, but current scheduling offerings do not provide the level of customization necessary for these individuals to organize tasks and track individual and project progress.

My team and I are working to design a scheduling app that will serve as a decision-support tool, employing graphical user interfaces and artificial intelligence (AI) to help acquisition personnel in creating a plan to tackle their pool of tasks, managing the plan under approaching deadlines, and dealing with potential setbacks. For example, if a project team were to face an obstacle (i.e. waiting for something to be approved) that blocks progress and pushes the completion of the RFP behind its original schedule, the app should “recalculate” and output

an updated schedule with adjusted intermediate deadlines in order to meet the overall project deadline.

Our client is two MITRE employees who speak on behalf of and represent all of the company's acquisition personnel. Currently, all acquisition planning is organized on a platform that by nature, lacks many of the features and capabilities necessary to support the uniqueness of the RFP creation process. Before beginning the design process, my team sought to first understand why our client was drawn to the idea of an IPA scheduling app, what their pain points are with the current system, and why they believe other scheduling apps are not sufficient. In our initial meetings, the client shared that they wanted a way to streamline and simplify current scheduling and a platform that supported a high level of customization. The client also expressed that while they were aware of other platforms that have superior functionality compared to their current system, they desired to take a step away from the "traditional" scheduling app and wanted something more playful and joyful to use. The client's request for a "playful" app completely changed our understanding of the task and approach to the design process as instead of constructing a purely functional business app capable of mitigating many of their current pain points, we were tasked with creating a digital experience.

To incorporate the client's variety of requests, our team divided into three groups, each focusing on a particular aspect of the app: the Tasks Group focused on the functional requirements and determining ways to streamline the RFP creation process, the Gaming Group focused on ways to enhance the user experience and make the app more playful, and the People-Finder Group focused on how personnel were to collaborate between team members and search for others within the company. The search function would locate individuals with expertise in a certain field who would be responsible for completing more technical portions of the RFP.

While this app is intended to serve a business purpose, our client has pushed for the integration of gaming and other playful components. The biggest challenge in the design process is figuring out the appropriate balance of “playfulness” and professionalism. My team must understand how the two interplay in the design and identify the points where increasing playfulness may result in poorer functionality and vice versa. My hope is that this research will help me to better understand how to integrate user experience into technology designed for business and to find the balance where the two can interplay without impeding one another.

## **Comparing Consumer and Producer Insights on User Interactions with IPAs**

*How do consumers interact with IPAs and how does collected consumer knowledge impact innovation around this technology?*

### *Introduction*

IPAs are being adopted at an increasingly high rate. A forecast produced by Gartner researchers estimates an annual market growth rate of 32.8% from 2016 to 2024 (Lackes, Siepermann, & Vetter, 2019). IPAs provide a variety of functionality to users ranging from simple tasks such as setting reminders to more complex tasks like communication between other nearby devices. Some of the most commonly used features of IPAs include playing music on demand, giving weather forecasts, retrieving general information, and setting alarms (Merritt, 2018). Given the increasing popularity of IPAs, my research seeks to understand why users adopt these devices, what they hope to get out of their interactions with them, as well as how their experiences are shaped by this technology. This paper will explore the interplay between consumers and IPA technology by assessing expressed consumer preferences and interactions and the innovation and advertising around IPAs.

## *Background and Theoretical Framework*

The growing adoption of IPAs prompts the question of what about these devices appeals to consumers and how are consumers typically interacting with these systems. These appeals and interactions vary by consumer so in order to better understand consumer values, it may be beneficial to identify and divide consumers into user groups that share similar reasoning as to why they purchased an IPA. This method maintains the different perspectives and avoids mass generalizing across groups. From a producer's perspective, understanding consumer values across the different user groups is helpful in integrating the various ideas to create a successful product that appeals to a wide range of users. An article by the Harvard Business Review comments on user satisfaction by arguing that in order for a platform to adequately service its consumers, it must constantly anticipate their needs. To do that, it must collect granular data on their purchasing patterns and product use and try to understand their goals (Dawar, 2018). With this in mind, my research will explore how IPA producers are collecting and analyzing data to enhance their campaign strategies and how consumers impact changes to the technology. I will also look into other factors that influence the innovation process such as financial constraints that may compete against user desires and require IPA producers to make tradeoffs in production.

In a study on the Amazon Alexa involving 19 participants responding to an online questionnaire, the results showed that users reported being satisfied with Alexa, even when its output did not produce the desired information (Lopatovska et al., 2019). This suggests that users may potentially value the interaction experience with these devices more than the accuracy of the information they produce. However, findings from other studies have found different results. One study involving 60 participants from a local IT company who submitted standardized requests to the assistant, found that the quality of speech recognition and intent classification

influences the user experience (Lopatovska et al.). This is an interesting idea as it suggests that user experience and the actual capabilities and functionality of the system are not mutually exclusive and therefore impact one another. Another study found that a range of factors affect satisfaction with IPAs and different scenarios are impacted by different factors; some of the identified factors include task completion, the amount of effort spent, and the ability of the IPA to understand the context of the conversation (Lopatovska et al.). This finding supports my earlier notion that interactions with IPAs vary by consumer and it is difficult to make overarching assumptions without dividing consumers into user groups. Consumer values are likely impacted by the reason the consumer purchased the IPA. Some users may want the IPA to enjoy the human-like interaction experience while others may want it to perform a specific service quickly. Different user groups would encompass these different purchase intents.

My research will compare consumer desires and interactions with IPAs to how IPA developers such as Amazon and Apple collect data on consumers and use their findings to improve their products. For example, if I found that consumers value the quality of speech recognition, I would look to see if producers are heavily researching how to improve this in their current systems and how they advertise these capabilities to users. Identifying the areas of alignment and dissonance between the desires of consumers and efforts of IPA producers will provide insight to the different internal and external factors that impact this sociotechnical system and how it continues to change overtime given new technological innovations and shifts in consumer preferences.

### *Evidence/Data Collection*

The evidence needed to address this topic is twofold: data on the consumer end revealing usage and attitudes toward IPAs and data on producer end revealing how data on consumers is

collected and analyzed to improve their products and marketing. The data collected on consumers will include a compilation of blogposts, discussion boards, redds, news articles, podcasts, and scholarly work with research and survey data. Following data collection, a discourse analysis will be performed to identify reoccurring topics and organize the topics under various themes to better understand user interactions and attitudes toward IPAs. As mentioned previously, consumers will be divided into various user groups to encapsulate the different reasons why one would purchase an IPA. It is also important to look at both why some consumers are choosing to buy IPAs and why others are not. While the focus of the research is on how users interact with these systems, looking at the opinions of individuals who are aware of the devices, but are not compelled to buy one can identify other aspects of IPAs that consumers are not fully satisfied with.

The evidence gathered on the producer side will consist of marketing campaign materials, patents, and scholarly work discussing the data companies collect and how they go about analyzing it. An article produced by Cracked Labs revealed that many companies are collecting tons of data from those who use their products, “In addition to information about the types of buildings people live in, companies now profile people with information about the types of websites they surf, metadata about the videos they watch, the apps they use, and the geographic locations they visit” (Christl, 2017). This article scrapes the surface in discussing the type of data these companies collect and how they go about analyzing it to determine the how to innovate their current products to better appeal to consumers. The article also discusses potential issues with the lack of transparency between the company and consumer regarding operations and usage of data. It will be interesting to look into how this lack of transparency may relate to why many consumers have decided not to purchase an IPA. This lack of transparency also effects my



analysis as while it would be ideal to look at a company report revealing how they collect and use data; this information is not typically released and my analysis is constricted to what is public. Once the data is collected on both ends (consumer and producer), further analysis will be used to compare common themes between the two identifying areas of unity as well as the discrepancies.

### *Application of Research*

My hope is that the analysis from this paper will interest both consumers and producers associated with IPAs, allowing them to see the interplay between their two parties and the apparent gaps in between. On the producer end, knowledge of these differences can help to indicate potential changes to their research and marketing strategy. On the consumer end, understanding where producers focus their efforts can identify certain features of IPAs that were perhaps unknown and unused before, which will help to maximize user experience with these systems.

### **Conclusion**

IPA technology is becoming extremely popular among consumers influencing their expectations and means of obtaining information. My research seeks to understand the interactions between IPAs and consumers, the varying agendas of producers and consumers, and how these groups are impacted and shaped by one another. Companies such as Apple and Amazon spend billions on advertising their new technology and I am interested in understanding how they go about collecting and assessing consumer data to enhance their operations. I am also interested in exploring how consumers use this technology and how their experience, preferences, and expectations are shaped with time. This paper strives to provide a detailed

analysis of how consumers and IPAs interact and influence one another as well as the underlying complexities of the sociotechnical system.

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