Virtual Personal Assistants—A different approach to supporting the end user

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1   Extended abstract

My research is focused on developing a model of a virtual personal assistant, a technology that interacts with one individual and develops a personal relationship to provide more contextually relevant outputs to the user. We are exploring similar technologies that exhibit different aspects of the model of technology we are describing to evaluate the usefulness of each component individually, although there is no reason why in the future they couldn't all be combined into a new technology. What these similar technologies lack is the personal feedback loop between the end user and the technology, where the personal assistant adapts to the end user and the user learns from the systems outputs.

Supporting technologies are becoming more involved in people's lives, both on a personal and professional level. This is in part due to the rise of new cutting edge technologies that allow these supporting systems to attempt to be useful in different aspects of a user's day to day life. The category of supporting technologies we are interested in are systems that specifically support the end user [1]. Examples of these systems typically have the ability to build metadata from a combination of inputs and stored data to be able to modify their outputs. An example of this can be seen with IBM's Watson, a system that can provide a medical diagnosis of a patient based upon its understanding of the symptoms [2]. Watson learns through analysing medical journals and comparing that to what it has already learnt from in order to provide the most logical diagnosis [3].

A number of modern supporting systems are utilizing learning capabilities to build a relationship with the user in an effort to provide more refined and useful outputs. A recent example of this is Apple's Siri, which provides support to its user in a casual context with enhancements based upon its knowledge of the user [4]. Siri learns from its interactions with the user and categorises the user with other users who

act in a similar fashion, allowing the program to tailor its outputs to a category of user rather than focusing on the individual [5]. While this grouping does help for Apple and Siri to learn about people as a whole, it loses the personal relationship with its end user.

When supporting systems of this type are kept within the context of the user they are able to develop a personal relationship with the unique user [6]. This allows the system to build its metadata in such a way that it is analysing inputs with the perspective it has built from the unique user, allowing it to give responses that are within the context of that user. With its own perspective which is an imitation of the users perspective, the system is able to analyse and explore uncertain or ambiguous problem spaces and still provide a relevant and useful discussion with the user about it. An example of this we have explored is the concept of a user owned decision support system [7]. Once the system has developed a personal relationship with the user it can discuss relevant options with the user based upon its own perspective which is within the context of its unique user. The focus isn't on providing the most likely option, but to explore alternative options with the user where the situation may be dealing with unknown variables.

When this type of technology is centralized or shared to give other stakeholders access to the content, some of the usefulness is lost as the relationship with the personality becomes less personal. Although the inclusion of other stakeholders into the content control of these systems can potentially have its benefits, it changes the dynamic of the relationship and effects the perspective of the system [8].

So what could this mean in the future? Popular media shows us what its potential is as assistants to explorers (such as in the game *Mass Effect: Andromeda),* partners for soldiers (such as in the movie *Hunter Prey)* or even as advice givers (such as in the Isaac Asimov book *I, Robot*). We are stepping away from the third party support of a system such as Amazon's *Alexa [9]* and looking at the more personal support relationship of a system such as *Iron man's Jarvis* [10].

With this in mind, I have formed the hypothesis that **end user supporting technologies that develop a personal relationship with an individual will have unique benefits that make the system more useful to the end user.** Appendix A Shows a reduced image of the accompanying poster.

References

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Appendix A

Virtual Personal Assistants—A different approach to supporting the end user

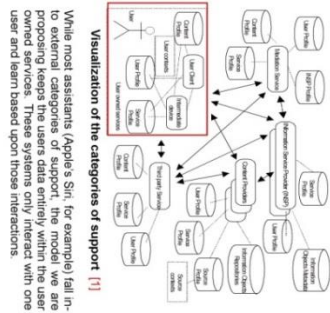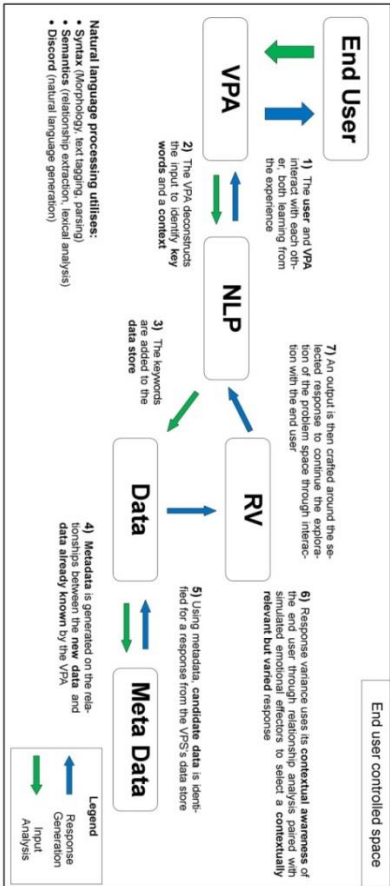Peter Imrie (peter.imrie@port.ac.uk) — University of Portsmouth