

Personas for Intelligent Email

Project Installment #1 – Family Planning – January 23, 2015

Introduction

Email is where many people receive and process most of their communication and much of their incoming information. Much of this information needs to be re-accessed over time. Processing email is time intensive and can be quite cognitively demanding.

Tags can help us retrieve email more quickly and easily, saving us time and sparing us frustration. Yet tags are not free to make and use. In most circumstances, it takes significant cognitive effort to construct a useful and comprehensive set of tags for email. In recent times, machine learning has been applied to make tags simpler and easier for people to use. Most of this machine learning has not involved end-users however. It is still an expensive endeavor to train an intelligent tagging assistant even if the potential pay-off is rewarding.

While there has been considerable research into how non-technical end-users develop and work with tags, there has been much less research into how highly technical expert users develop and work with tags. This sort of research would be interesting in and of itself, but with the relatively recent maturation of machine learning and the common use of various “intelligent assistants” such as Siri and Google Now, the most intriguing research involves how and why an expert user utilizes an intelligent tagging assistant to manage their email. Furthermore, the larger context of this “expert user” needs to be considered so that we can identify where an intelligent email assistant really helps the “expert user” and where it does not.

It is safe to say that some aspects of the design of the OSU “Email Predictor” system do not adequately take into account the potential dominance of the end user persona of the user, are not aware of the larger context of the user’s work and environment, or do not adequately factor in the value of the user’s time. The end user may be averse to spending their time learning anything about the assistant beyond the core tasks they use the assistant for. An intelligent assistant may be more effective if designed using personas.

Professor Persona Family Planning

The intelligent email assistant has been in use for approximately the past seven years. The software has evolved in a variety of ways over these years and continues to evolve. When an opportunity to use the personas technique became available, there was considerable interest in using this technique for the email assistant. Briefly, per Wikipedia, a description of a persona:

“A user persona is a representation of the goals and behavior of a hypothesized group of users. In most cases, personas are synthesized from data collected from interviews with users. They are captured in 1–2 page descriptions that include behavior patterns, goals, skills, attitudes, and environment, with a few fictional personal details to make the persona a realistic character. For each product, more than one persona is usually created, but one persona should always be the primary focus for the design.”

Using personas to help improve the design and development process is a natural fit as there are different types of users of the email assistant. Currently, design and development processes do not adequately represent these different users and their various roles.

The persona technique is new to most members of the product team.

Putting together the core team:

The core team is comprised of the members of our class project team, namely Ying, Sruti, Rasha, and Michael. Professor Tom Dietterich is the project sponsor and key stakeholder. Michael is a member of the email assistant product team and has used personas (and other UCD techniques) in the past.

Persona Core Team

- Ying, personas project team member
- Sruti, personas project team member
- Rasha, personas project team member
- Michael, personas, intelligent email project team member

Persona On-call Team

- Professor Tom Dietterich, project sponsor/executive
- Professor Margaret Burnett, personas/research advisor
- Shahed Sorower, long term project team member
- Kayla Looney, former long term project team member

Creating the Action Plan

Resources for Our Persona Effort

- 2-5 hours every week for the 4 people on the core team.
- Resources to conduct interviews with professors including users' time, recording devices / software
- Survey with users
- License for some office suite with spreadsheets
- Access to computer for each of the people on the core team

Product Problems We Want To Solve with Personas

- Improve user-centricity:
The product doesn't take into account the day to day life of a professor. For many tags, there are particular workflows and contexts that the software doesn't know about it. By using a professor persona, we hope to design and implement features in a way that better supports the user.
- Better separate research from end-user concerns:
Parts of the product are geared towards research and other parts towards end-user features. Sometimes features for these different parts are not developed adequately, because there is no clearly defined model of the "researcher" or the "end user". Personas should help us target these often divergent features for different types of user better.

Process Problems We Want To Solve with Personas

- **Improve feature triage:**
In team meetings and other situations, sometimes it is difficult to triage features. We don't understand how they will be used and/or why. Personas should enable us to better answer questions such as "would Tom use this feature?" as well as enable us to construct a feature-persona weighted priority matrix that should help us prioritize features for a product development cycle.
- **Better feature and specification documentation:**
Our feature description/specification documents can become more lifelike, i.e. contain feature walkthroughs using personas. We can also list target personas for different features.
- **Improved shared understanding:**
The development team often feels like they have different pictures in mind of the users who run the intelligent assistant. Personas should give development a better connection to who we are trying to help with this app and give us a common language across development, design, product management, etc. The design documents, for example, will incorporate personas which will give development a more singular context they understand, e.g. each of the personas.

Persona Action Plan

Phase	Activity	When Completed	Related Project Milestones
Family planning	Organization introspection. Building core and on-call team. Creating an Action plan. Data collection (in progress)	1/23/2015	Goals (business, user experience).
Conception and gestation	Data organized. Personas creation complete. Evaluation and prioritization by stakeholder complete.	2/5/2015	Description of user segments and our target user. Functional requirements
Birth and maturation	Persona effort introduced to the team.	2/19/2015	Goal: get the persona known and used and integrated in design and development activities.
Adulthood	Persona artifacts delivered.	3/5/2015	
Persona Project Conclusion	Final presentation of personas.	3/10/2015 to 3/12/2015	

Data Source Categories

Existing primary data sources (internal): Data collected from past product experience and previous research performed by the product team.

Existing primary data sources (external): Data collected from third party research and publications and possibly related web sources.

Original primary data sources: We will interview some of our target users (users who are more like our persona) during creating our persona.

Data Collection by Topic

	Internal Product Experience and Research	Surveys and/or Interviews	Sources found via web search or academic research	More data needed
Email and Information Overload				
How many intelligent email assistants exist in the market?			√	√
How many people are using intelligent email assistants?			√	√
What intelligent email functions are most used?	√			√
Why do most users adopt an intelligent email assistant?	√		√	√
How are intelligent email assistants used in the academic environment?	√	√	√	√
What percentage of apps offer on-demand coaching or instruction in how to train the assistant?			√	√
What percentage of intelligent assistants apps are focused only on beginners?			√	√
What percentage of intelligent assistants apps are focused only on experts?			√	√
How many intelligent assistants has the typical intelligent assistant user tried/used?		√	√	√
Multitasking				
How does the user multitask using email?		√		√
What percentage of the typical workday is spent multitasking?				√
How many tasks does the user typically deal with each day?				√
How does the user recover context when task switching?				√
How much time does the user think is wasted in switching tasks too frequently?				√
How much time does the user lose due to distraction?		√		
What other apps does the user have to help with multitasking?		√		

	Internal Product Experience and Research	Surveys and/or Interviews	Sources found via web search or academic research	More data needed
How well does the computer support the user's multitasking patterns?				√
What sort of skill level with multitasking does the user believe they have?				√
How many computers and devices does the user normally use during the course of a day?				√
What is the typical mix of multitasking activities?				√
Project Management				
How many projects I the user involved with?		√	√	√
How many projects does the user manage?		√	√	√
What applications (desktop, web, mobile) does the user use for project management?		√	√	√
How does the user use email with different projects?		√	√	√
What does the user think is missing from being able to manage projects better?		√	√	√
How does the user multitask with different projects?		√	√	√
Does the user have formal education/background in project management?			√	√
What email features does the user to support project management?		√	√	√
Information Organization and Retrieval				
How does the user organize the information on their computer (folders, tags, desktops, etc.)?		√	√	√
What apps, tools does the user use for information organization and retrieval?			√	√
What does an email-user use email for, other than communication?			√	
How does the user organize their email?			√	

	Internal Product Experience and Research	Surveys and/or Interviews	Sources found via web search or academic research	More data needed
How does the user retrieve files and documents?			√	
How does the user retrieve email?			√	√
In what use-cases does a user retrieve old email?				√
How often does the user retrieve email (times/day)?			√	√
How often does retrieval fail (times/day)?			√	
How well does the computer support the user's organization/retrieval needs?			√	
Professor Work Environment and Success Factors				
How do professors use email in the work environment?		√	√	
What do professors believe are the "success factors" of using email well in the academic environment?		√	√	
How does email intersect with the day to day requirements, structure, and demands of a professor's work?		√	√	
What percentage of a professor's communications take place via email?		√	√	
How well does a professor's existing email application support the various workflows associated with their job?		√	√	
How many professors are using intelligent email assistants?		√	√	
How do professors organize their email?		√	√	
How do professors multitask?		√	√	
How many projects are professors involved with?			√	
How often do professors check their email?			√	√
What are typical "email doesn't work" scenarios for professors?		√	√	√
How do professors feel about using research software to help them with their email?		√	√	√

	Internal Product Experience and Research	Surveys and/or Interviews	Sources found via web search or academic research	More data needed
Self-Efficacy and Learning Approaches				
To what extent do users explore new features which were not present in the previous app version?			√	
Would having game-type features in the app lead to better training of the intelligent assistant?		√	√	
Attitude Toward Risk and Exploration				
How do we minimize the risk of using new features?			√	√
How can we make getting going with the app as quick as possible?			√	
How can we guide the user to use new features so they are used in a way very similar to the old features that they already know?			√	√
Early Adopters				
What drives users to be early adopters of intelligent email assistant technology?			√	√
Would having game-type features for using the intelligent assistant lead to greater interest and adoption?		√	√	

Research Publication Data Sources and Categories

Data Source Number	Data Source	Use in Persona?
	Gender and Other End-User Considerations	
	Beckwith, L. A. (2007). <i>Gender HCI issues in end-user programming</i> (Doctoral dissertation).	Maybe
	Beckwith, L., Sorte, S., Burnett, M., Wiedenbeck, S., Chintakovid, T., & Cook, C. (2005, September). Designing features for both genders in end-user programming environments. In <i>Visual Languages and Human-Centric Computing, 2005 IEEE Symposium on</i> (pp. 153-160). IEEE.	Maybe
	Tan, D. S., Czerwinski, M., & Robertson, G. (2003, April). Women go with the (optical) flow. In <i>Proceedings of the SIGCHI conference on Human factors in computing systems</i> (pp. 209-215). ACM.	Maybe
	Busch, T. (1995). Gender differences in self-efficacy and attitudes toward computers. <i>Journal of educational computing research</i> , 12(2), 147-158.	Maybe

	Hartzel, K. (2003). How self-efficacy and gender issues affect software adoption and use. <i>Communications of the ACM</i> , 46(9), 167-171.	Maybe
	Morris, M. G., & Dillon, A. (1997). The influence of user perceptions on software utilization: application and evaluation of a theoretical model of technology acceptance.	Yes
	Putrevu, S. (2001). Exploring the origins and information processing differences between men and women: Implications for advertisers. <i>Academy of Marketing Science Review</i> , 10(1), 1-14.	Maybe
	Meyers-Levy, J., & Sternthal, B. (1991). Gender differences in the use of message cues and judgments. <i>Journal of marketing research</i> , 84-96.	Maybe
	Grigoreanu, V., Cao, J., Kulesza, T., Bogart, C., Rector, K., Burnett, M., & Wiedenbeck, S. (2008, September). Can feature design reduce the gender gap in end-user software development environments? In <i>Visual Languages and Human-Centric Computing, 2008. VL/HCC 2008. IEEE Symposium on</i> (pp. 149-156). IEEE.	Maybe
	Beckwith, L., Kissinger, C., Burnett, M., Wiedenbeck, S., Lawrance, J., Blackwell, A., & Cook, C. (2006, April). Tinkering and gender in end-user programmers' debugging. In <i>Proceedings of the SIGCHI conference on Human Factors in computing systems</i> (pp. 231-240). ACM.	Maybe
	Beckwith, L., Burnett, M., Wiedenbeck, S., Cook, C., Sorte, S., & Hastings, M. (2005, April). Effectiveness of end-user debugging software features: Are there gender issues? In <i>Proceedings of the SIGCHI conference on Human factors in computing systems</i> (pp. 869-878). ACM.	Maybe
	Beckwith, L. (2005, April). Gender HCI issues in problem-solving software. In <i>CHI'05 Extended Abstracts on Human Factors in Computing Systems</i> (pp. 1104-1105). ACM.	Maybe
	Jianakoplos, N. A., & Bernasek, A. (1998). Are women more risk averse? <i>Economic inquiry</i> , 36(4), 620-630.	Maybe
	Kulesza, T., Wong, W.-K., Stumpf, S., Perona, S., White, R., Burnett, M., Oberst, I. and Ko, A. Fixing the program my computer learned: Barriers for end users, challenges for the machine. <i>Proc. IUI, ACM</i> (2009), 187-196.	Yes
	Stumpf, S., Rajaram, V., Li, L., Wong, W.-K., Burnett, M., Dietterich, T., Sullivan, E., Herlocker, J. Interacting meaningfully with machine learning systems: Three experiments, <i>Int. Journal Human-Computer Studies</i> 67 (2009), 639–662.	Yes
	Kulesza, T., Stumpf, S., Burnett, M., Kwan, I. Tell me more? The effects of mental model soundness on personalizing an intelligent agent. <i>Proceedings of the SIGCHI Conference on Human Factors in Computing Systems</i> (2012), 1-10.	Yes
	Subrahmaniyan, N., Burnett, M., Bogart, C. Software visualization for end-user programmers: trial period obstacles. <i>Proceedings of the 4th ACM symposium on Software visualization</i> (2008). 135-144.	Yes
	Paradox of the Active User	
	Carroll, J. M., & Rosson, M. B. (1987). Paradox of the active user. In J. M. Carroll (Ed.), <i>Interfacing thought: Cognitive aspects of human-computer interaction</i> . Cambridge, MA: MIT Press.	Yes

	Attention Investment	
	Blackwell, A., Burnett, M. First Steps in Programming: A Rationale for Attention Investment Models Human Centric Computing Languages and Environments, 2002. Proceedings. IEEE 2002 Symposia.	Yes
	Minimal Learning Theory	
	Carroll, J.M., and H. van der Meij. "Principles and Heuristics for Designing Minimalist Instruction." In Minimalism Beyond the Nurnberg Funnel, ed. John. H. Carroll, pp.20-53.Cambridge, MA: MIT Press, 1998.	Maybe
	Barbara M. "Minimalism for Complex Tasks". Minimalism beyond the Nurnberg Funnel, ed. John M. Carroll, pp. 179-218. Cambridge, MA: MIT Press, 1998.	Maybe
	Hackos J, "An Application of the Principles of Minimalism to the Design of Human- Computer Interfaces," Common Ground (1999), 9:17–2.	Maybe
	Early Adopters	
	Vito Brancaleone and John Gountas (2007),"Personality Characteristics of Market Mavens", in NA - Advances in Consumer Research Volume 34, eds. Gavan Fitzsimons and Vicki Morwitz, Duluth, MN: Association for Consumer Research, Pages: 522-527.	Maybe
	Rogers, Everett M., Diffusion of Innovations, Fourth Edition (1995). The Free Press, New York.	Yes
	Robinson, Les. (2009) Summary of Diffusion of Innovations. In Enabling Change.	Yes
	Project Management	
	Annika Zika-Viktorsson, Per Sundström, Mats Engwall, Project overload: An exploratory study of work and management in multi-project settings, International Journal of Project Management, Volume 24, Issue 5, July 2006, Pages 385-394, ISSN 0263-7863, http://dx.doi.org/10.1016/j.ijproman.2006.02.010 http://www.sciencedirect.com/science/article/pii/S0263786306000329	Yes
	Victor M. González and Gloria Mark. 2004. "Constant, constant, multi-tasking craziness": managing multiple working spheres. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '04). ACM, New York, NY, USA, 113-120. DOI=10.1145/985692.985707 http://doi.acm.org/10.1145/985692.985707	Yes
	Angela Clarke, A practical use of key success factors to improve the effectiveness of project management, International Journal of Project Management, Volume 17, Issue 3, June 1999, Pages 139-145, ISSN 0263-7863, http://dx.doi.org/10.1016/S0263-7863(98)00031-3 . http://www.sciencedirect.com/science/article/pii/S0263786398000313	Yes
	Richard Boardman and M. Angela Sasse. 2004. "Stuff goes into the computer and doesn't come out": a cross-tool study of personal information management. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '04). ACM, New York, NY, USA, 583-590. DOI=10.1145/985692.985766 http://doi.acm.org/10.1145/985692.985766	Yes

Victoria Bellotti, Nicolas Ducheneaut, Mark Howard, and Ian Smith. 2003. Taking email to task: the design and evaluation of a task management centered email tool. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '03). ACM, New York, NY, USA, 345-352. DOI=10.1145/642611.642672 http://doi.acm.org/10.1145/642611.642672	Yes
Robert Kraut, Carmen Egidio, and Jolene Galegher. 1988. Patterns of contact and communication in scientific research collaboration. In Proceedings of the 1988 ACM conference on Computer-supported cooperative work (CSCW '88). ACM, New York, NY, USA, 1-12. DOI=10.1145/62266.62267 http://doi.acm.org/10.1145/62266.62267	Yes
Roman Boutellier ¹ , Oliver Gassmann ² , Holger Macho ³ and Manfred Roux ³ . 17 DEC 2002. R&D Management, Volume 28, Issue 1, pages 13–25, January 1998. http://doi.acm.org/10.1111/1467-9310.00077	Yes
Victoria Bellotti, Nicolas Ducheneaut, Mark Howard, Ian Smith, and Christine Neuwirth. 2002. Innovation in extremis: evolving an application for the critical work of email and information management. In Proceedings of the 4th conference on Designing interactive systems: processes, practices, methods, and techniques (DIS '02). ACM, New York, NY, USA, 181-192. DOI=10.1145/778712.778740 http://doi.acm.org/10.1145/778712.778740	Yes
Andrew Faulring, Brad Myers, Ken Mohnkern, Bradley Schmerl, Aaron Steinfeld, John Zimmerman, Asim Smailagic, Jeffery Hansen, and Daniel Siewiorek. 2010. Agent-assisted task management that reduces email overload. In Proceedings of the 15th international conference on Intelligent user interfaces (IUI '10). ACM, New York, NY, USA, 61-70. DOI=10.1145/1719970.1719980 http://doi.acm.org/10.1145/1719970.1719980	Yes
Information Organization and Retrieval	
Boardman, Richard, Robert Spence, and M. Angela Sasse. "Too many hierarchies? The daily struggle for control of the workspace." Proc. HCI International 2003. Vol. 1. 2003.	Yes
Cselle, Gabor. "Organizing email." Master's thesis, ETH Zurich (2006).	Yes
Whittaker, Steve, et al. "Am I wasting my time organizing email? a study of email refinding." Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. ACM, 2011.	Yes
William Jones, Harry Bruce, and Susan Dumais. 2001. Keeping found things found on the web. In Proceedings of the tenth international conference on Information and knowledge management (CIKM '01), Henrique Paques, Ling Liu, and David Grossman (Eds.). ACM, New York, NY, USA, 119-126. DOI=10.1145/502585.502607 http://doi.acm.org/10.1145/502585.502607	Yes
Fisher, Danyel, et al. "Revisiting Whittaker & Sidner's email overload ten years later." Proceedings of the 2006 20th anniversary conference on Computer supported cooperative work. ACM, 2006.	Yes
Mackay, Wendy E. "More than just a communication system: diversity in the use of electronic mail." Proceedings of the 1988 ACM conference on Computer-supported cooperative work. ACM, 1988.	Yes
Ames, M., Naaman, Mor., Why we tag: motivations for annotation in mobile and online media, Proc. CHI, ACM (2007), 971-980.	

	Multitasking	
	Spink A., "Multitasking information behavior and information task switching: an exploratory study", Journal of Documentation, Vol. 60 Iss: 4, pp.336 – 351, (2004).	Yes
	Appelbaum S. H., Marchionni A., Ferdandez A. The multitasking paradox: Perceptions, problems and strategies. Management Decision (2008) 46(9):1313–1325 [CrossRef]	Yes
	Carr, P. and Lu, Y. (2007) Information technology and knowledge worker productivity: A taxonomy of technology crowding, Proceedings of the 13th Americas Conference on Information Systems. Paper 51, Keystone, CO, USA.	Maybe