Co-constructing a Software Agent Utopia:
User and Maker in the Discursive Construction of Amy Ingram

Master Thesis

New Media and Digital Culture

Utrecht University

Lisa Prins
5630193

March 20, 2017

Supervisor and first reader: Dr. N. Kerssens
Second reader: Dr. I.O. De Vries

Abstract

Today, part of the control we have over our actions is substituted through the software agent. It is therefore important to realize how an understanding of the software agent is constructed through discourse. The aim of this thesis is to discover how maker and users discursively co-construct an understanding of the software agent. This study focuses specifically on the software agent Amy Ingram. Amy does the tasks of making appointments and scheduling meetings. X.ai, the company that makes Amy Ingram, and the users of its technology share their intentions and experiences through blog posts and comments on a Twitter page. This forms a corpus for this study, which is analyzed to answer the questions how X.ai's software agent Amy Ingram is discursively co-constructed by user and maker, and if this co-construction contributes to a utopian discursive construction of the software agent. The discursive construction – the creation of an understanding through discourse – of the software agent is examined through a discourse analysis of the corpus. By contributing to the blog platform, the maker constructs a certain image of Amy. However, by also providing a Twitter page, the maker enables the users to discursively contribute to or contradict this image. This thesis concludes that, through the use of linguistic tools (e.g. configuration and personal pronouns) and the adoption of a utopian vocabulary, the maker and the users co-construct a common vision of Amy Ingram as an active agent with humanistic attributes. This study suggests that it is necessary to conduct more research regarding the terminology used to refer to artificially intelligent agents. Additionally, it is recommended that further research on multi-agency software agents should also consider the co-constructive influence of maker and user through discourse.

Key words: discourse, co-construction, software agent, artificial intelligence, anthropomorphism, cyborg discourse, technological imaginary, utopia.

Table of Contents

Hi, I'm Amy

Your AI powered personal assistant for scheduling meetings. You interact with me as you would to any other person – and I'll do all the tedious email ping pong that comes along with scheduling a meeting.

No sign-in, no password, no download, all you do is:

Cc: amy@x.ai

1. Introduction

Today, carrying out tasks traditionally handled by humans is not limited to search engines such as Google or Yahoo – applications and virtual assistants are also capable of this. Software agents, also referred to as humanoids or conversational interfaces, are activated through speech recognition and natural language processing. Artificial intelligence (AI) – which consists of code and algorithms programmed by engineers – enables these agents to carry out routine tasks and interact with users. As referred to by B.W. Schermer, "[b]y using software agents, we relinquish part of the direct control we have and substitute it with indirect control through the agent."[1] The popular-tech press argues that the pervasiveness of software agents has resulted in the formation of a whole new bot-minded "generation AI," consisting of children who will grow up unable to distinguish human communication from interaction with software agents.[2] This prediction calls into question what values and functionalities makers and users deem important when looking at artificially intelligent technologies.

Software agents are being deployed to access (personal) data, solve problems and filter news – all based on a particular vocabulary, and limited capabilities and capacities that have been programmed by designers and engineers.[3] For the human user of the software agent, these limited capabilities have problematic implications linked to ethical, privacy and legal issues concerning the personal user data that AI companies access and collect. For instance, Samuel Woolley et al. discuss the threat of policies that are designed to allow bots to interfere and influence human social behavior.[4] I will not delve further into these implications as they instigate numerous debates. However, it is important to be aware of the constraints linked to the design of software agents when discussing the role of discourse in the understanding of the agent.

Current discursive constructs about AI are formed by journalists, scientists, politicians and designers but, first and foremost, by the makers and users of technology. It is relevant to discuss both roles because the makers engineer the software agents and program the algorithms,

---

[1] B.W. Schermer, "Software Agents, Surveillance, and the Right to Privacy: A Legislative Framework for Agent-Enabled Surveillance," (Dissertation PhD, Leiden University Press, 2007): 3.
[2] Remi El-Ouazzane, "Growing Up in Generation AI," *TechCrunch* (September 2016), https://techcrunch.com/2016/09/03/growing-up-in-generation-ai/.
[3] Sean Zdenek, "Artificial Intelligence as a Discursive Practice: The Case of Embodied Software Agent Systems," in *AI & Society* 17, no. 3 (November 2003): 343.
[4] Samuel Woolley et al., "How to Think About Bots," *Motherboard* (February 2016), http://motherboard.vice.com/read/how-to-think-about-bots.

and the users then interact with and attribute meaning to their actions. Thus, an understanding of a technology is created by its maker and users. This thesis therefore deals with both the maker's and user's discursive co-construction of software agents. More specifically, it examines the extent to which users do or do not play an active role in the discursive construction of the company X.ai's emailing assistant Amy Ingram.

1.1 X.ai's Amy Ingram

The company and platform X.ai is the maker of the software agent called Amy Ingram. Amy is a software agent whose purpose is to arrange meetings and appointments for the user of the technology. Apart from the feminine Amy there is also a male alternative called Andrew Ingram. The agent is not an application that has to be downloaded, but a feature that can be added to the sender's e-mail provider (either Outlook, Gmail or other). Amy is activated when the sender, referred to as the user, pastes Amy's e-mail address in CC. In this e-mail, forwarded to Amy, it is stated that the user would like to schedule a meeting with person X. Amy will then take all the further work out of the user's hand and get in touch with person X. Once person X and Amy have come to an agreement regarding time and location, both the user and person X will be sent an invite. The meeting can now take place.

The company X.ai has been adjusting the technology for the past three years with a closed beta test panel, and now its first professional edition has been released to the public.[5] Amy is not fully artificial; behind the agent and every e-mail is an AI trainer adjusting and correcting Amy where necessary.[6] The agent is machine driven: She functions on natural language processing, meeting preference analysis, architecture design and X.ai's Recurrent Neural Network (RNN), which makes predictions based on sequential data. The AI trainers only come into play when Amy does not "understand" something.

In this thesis, I focus specifically on the Amy software agent because it performs a seemingly simple task: making appointments. By researching the implications of one task, this study forms a suitable starting point for further research on the roles of maker and user in the

[5] "Launching the Professional Edition," *X*.ai (October 2016), https://x.ai/launching-the-professional-edition/.
[6] Ellen Huet, "The Humans Hiding Behand the Chatbots," in *Bloomberg* (April 2016), https://www.bloomberg.com/news/articles/2016-04-18/the-humans-hiding-behind-the-chatbots.

discursive construction of multi-agency bots such as Siri and Google Now.[7] [8] To receive feedback and user reviews, the X.ai platform enables users to describe their interactions with Amy Ingram on a Twitter page called Love Notes. Here, the maker provides a platform for a discussion about Amy Ingram and invites the user to actively contribute. The launch of X.ai's closed beta community provides an extensive platform for this discussion, and, therefore, a great deal of the discussion surrounding Amy Ingram is shaped by the user.[9] Due to the amount of data made publicly available, this object of study provides sufficient information to base my analysis on. Apart from Love Notes, X.ai also has a blog platform that enables the company to contribute to the discursive formation of the agent. Thus, both maker and user contribute to Amy's discursive construction. As opposed to software agents such as Siri or Microsoft's Tay,[10] [11] no previous academic research has focused on Amy Ingram. My corpus for this thesis consists of blog entries on the X.ai website and user comments on Twitter.

1.2 The Maker's and User's Relation to Technology: A Current State of Affairs

Numerous studies have focused on the maker as the primary agent in the construction of a technology, referring to the users as configured by the designer.[12] Pro-maker discourse is counteracted by scholars who focus on the power of the consumer, by mentioning either the power the user has in enabling an understanding of (unintended) consequences of technologies,[13] or the fact that designers can also be configured by the users.[14] Oudshoorn and Pinch emphasize

[7] Charles Jolley, "AI101: The Multi-Agent Problem," *Medium* (July 2016). https://medium.com/teamozlo/assistants-and-the-multi-agent-problem-242d29cc11f5#.rq13u8jpd. Multi-agency bots consist of not one program, but numerous separate programs that each carry out their own tasks.
[8] Apple, "Siri," *Apple inc.* (2016-2017), http://www.apple.com/ios/siri/;
Google, "Google App," *Google Inc.* (2016-2017), https://www.google.com/search/about/.
[9] Nelly Oudshoorn and Trevor Pinch, *How Users Matter: the Co-construction of Users and Technology* (Cambridge, MA: The MIT Press, 2003). I will discuss the relevance of the user in the discursive construction in chapter 2.1, by referring to Oudshoorn and Pinch.
[10] J.R. Bellegarda, "Spoken Language Understanding for Natural Interaction: The Siri Experience," in *Natural Interaction with Robots, Knowbots and* Smartphones (2014).
[11] Gina Neff and Peter Nagy, "Talking to Bots: Symbiotic Agency and the Case of Tay," in *International Journal of Communication* 10 (2016).
[12] Oudshoorn and Pinch, *How Users Matter: the Co-construction of Users and Technology*, 31.
[13] Ibid., 5. In their reference to Cowan, who "urged historians and sociologists of technology to choose the user, rather than the artifact or the technologist."
[14] Ibid., 8. In their reference to Mackay et al., who suggested that designers configure users but that users also configure designers.

user-technology relations by focusing on the influence of groups (experts and advocacy groups) and politics in the representation of the user.[15] Akrich hereby adds the role of the maker and proposes a co-constructive back and forth between user and maker in the development of a technology. However, she does not discuss how this can be reflected in discourse.[16] Discourse is an important platform for the discussion and understanding of technology. Flichy discusses the role of discourse and attributes agency to the social in the discursive construction of a technical object but does not explicitly focus on the maker and user. The users and maker play an important role in the creation of an understanding of technology. Therefore, a focus on the co-construction of maker and user makes a relevant contribution to research on the roles of makers and users in the construction of technology.

This study also makes a relevant contribution to the research on AI agents. The software agent has been an important object of discussion in the field of new media studies. In cyborg literature, it is often discursively constructed as being "humanlike," a term that mainly focuses on the dominant role of the software agent instead of the user of the technology.[17] Thus, the AI is discursively constructed as having power over the human user. This is an intriguing aspect that suggests numerous topics of discussion, often concerning the fear or potential of machines taking over humans, depending on perspective. Humanization is a function programmed into the software agent with the goal to create a natural interaction, but it is the discourse about the agent that normalizes and idealizes the idea of a humanistic software agent. Instead of describing the humanity of the software agent as something that is inevitable,[18] my aim is to research how the maker and users discursively contribute to utopian discourse by attributing certain (humanistic) functions to the software agent. Here, I will investigate if the maker and users create a desire for

---

[15] Ibid., 24.
[16] Ibid., 9.
[17] Shangyang Zhao, "Humanoid social robots as a medium of communication," in *New Media & Society* 8, no. 3 (June 2006);
T.B. Sheridan, "Human-Robot Interaction: Status and Challenges," in *Human Factors: the Journal of the Human Factors and Ergonomics Society* 58, no. 4 (2016).
[18] Dirk Wagner, "Software Agents take the internet as a Shortcut to Enter Society: A Survey of New Actors to Study for Social Theory," in *First Monday* 5, no.7 (July 2000);
Björn Hermans, "Intelligent Software Agents on the internet: An inventory of Currently Offered Functionality in the Information Society and a Prediction of (Near) Future Developments," in *First Monday* 2, no.3 (March 1997);
Yannis Labrou et al., "Agent Communication Languages: The Current Landscape," in *IEEE Intelligent Systems* (April 1999), 45;
Sheridan, "Human-Robot Interaction: Status and Challenges," 525.

a "better" technology that explores new possibilities.[19] In my investigation I discovered that not only academic literature but also popular-tech press refer to the software agent as the agent that will enhance efficiency and intelligence and lead to a better future.[20] The tendency to describe upcoming technological innovations as the ideal solution is mentioned by Doug Bierend: "Every new technological development has also been labeled with the promise of a true revolution."[21] Throughout this study I will refer to the promise of an ideal technology by using the following concept of "utopia": "Taking mainly the shape of a process, refusing the label of an 'impossible dream', utopia is a programme for change and for a gradual betterment of the present."[22] In this study, my aim is to critically look at how the maker and users give shape to this "imaginative projection of possible ideals" through the discursive construction of Amy Ingram.[23]

This raises this study's main research questions: How is the Amy Ingram software agent discursively co-constructed by the user and maker? Does this co-construction contribute to a utopian discursive construction of the software agent? The main research questions are divided into the following sub-questions: In what ways does the maker contribute to a utopian discursive construction of the software agent? In what ways does the user contribute to a utopian discursive construction of the software agent?

In chapter 2, I discuss the main relevance of this research by constructing a theoretical framework. Here, I refer to the authors who discuss user-maker relations, the software agent, and I introduce Flichy's ideological framework. Chapter 3 delves further into the methodological aspects of this thesis and the corpus I will focus this study on. Chapter 4 consists of the analysis, by looking at both maker and user discourse. In chapter 5, I conclude my main findings and arguments, after which I make suggestions for further research in the discussion of chapter 6.

---

[19] Imar de Vries, *Tantalisingly close: An archaeology of communication desires in discourses of mobile wireless media* (Amsterdam: Amsterdam University Press, 2012), 42. De Vries refers to Thomas More's concept of "utopia" as an "envisioned better place."

[20] Arjun Kharpal, "Elon Musk: Human must merge with machines or become irrelevant in AI age," *CNBC* (February 2017), http://www.cnbc.com/2017/02/13/elon-musk-humans-merge-machines-cyborg-artificial-intelligence-robots.html. In this example AI is portrayed as an ideal solution: "In an age when AI threatens to become widespread, humans would be useless, so there's a need to merge with machines."

[21] Doug Bierend, "The Conversation about VR Struggles to Get Real," *Motherboard* (November 2016), http://motherboard.vice.com/read/the-conversation-about-vr-struggles-to-get-real. As cited reference to Sandra Rodriguez.

[22] Gregory Claeys, *The Cambridge Companion to Utopian Literature* (Cambridge: Cambridge University Press, 2010), 23.

[23] De Vries, *Tantalisingly close: An archaeology of communication desires in discourses of mobile wireless media,* 42.

2. Theoretical Framework

2.1 Co-constructing Amy: User and Maker

The user is an important agent in technology, because it is a user's interaction with a technology that ascribes meaning to it. As explained by Nelly Oudshoorn and Trevor Pinch:

> Users are not simply passive recipients of technology; they are active and important actors in shaping and negotiating meanings of technology, which is significant both for understanding design processes and the relationship between the identities of technologies and their users.[24]

Through discourse, the user and the maker speak about a software agent and form expectations and create an image of the technology. In this study, I use the following definition of agent: "A grammatical agent is a participant in a situation who carries out an action."[25] The maker's discursive construction has a marketing/hype-forming background that clarifies the maker's intentions. However, as stated by Björn Hermans: "The success and development of agents and the agent technique are driven by users really, instead of by producers [makers] or researchers."[26] As a result, Hermans argues, it is important not to overlook the user factor when considering what an agent is and which of its aspects are more important or less important. It is through the user's representation of a technology that the technology is given new life, when users invent completely new uses and meanings for it.[27] On the other hand, not all studies acknowledge the active role of the user. An approach adopted by science and technology studies emphasizes the roles of powerful contributors such as engineers and scientists in the production of technologies. Therefore, it is also important not to ignore the role of the maker because of his or her decisive position in producing a technology and constructing its meaning. As mentioned by Oudshoorn, the maker has a hypothetical user in mind when creating a technology, and this prescribed usage constructs who the user should be. It is therefore essential to consider the maker's intentions when discussing the user's reception of a technology.

[24] Oudshoorn and Pinch, *How Users Matter: the Co-construction of Users and Technology*, 69.
[25] Paul Baker and Sibonile Ellece, *Key Terms in Discourse Analysis* (London: Continuum, 2011), 4.
[26] Hermans, "Intelligent Software Agents on the internet," 1997.
[27] Oudshoorn and Pinch, *How Users Matter: the Co-construction of Users and Technology*, 16.

This study focuses on the maker's and user's co-construction because the maker, or innovator, of a technology always has an envisioned user in mind, who is the "future 'real' user in the mind of the developers, and this enables them to anticipate potential uses of the technology."[28] This envisioned user is referred to as the reflexive user.[29] The reflexive user is, however, bound to be replaced by the real user, who represents the actual usage of the technology, which is performed out of the maker's control. I argue that there is an interrelation between the reflexive user and the real user. The reflexive user (as defined by the maker) influences the reception of the technology by defining the discursive setting (e.g., Love Notes). The discursive setting is often formed in the testing phase or the beta phase, as is the case with Amy. Madeleine Akrich describes the discursive setting as a vision or script about the world that "innovators" or makers inscribe into the technical content of the object and thus attempt to predetermine the settings the users are asked to imagine.[30] I argue that in the case of Amy Ingram, a co-construction takes place where the maker, the maker's reflexive user and the actual user together form the discursive construction of a vision of the technology. Therefore, not only the maker but also the user plays an active role in the construction of Amy.

As argued by Oudshoorn, the maker's vision of the imagined user is not static. By using the Amy Ingram technology, for example, the user ascribes meaning to it and creates a discursive representation of it on the Love Notes platform. Woolgar uses the term "configuration" to describe the reflexive, imagined users, approaching them as being represented by a designer rather than considering them an independent group.[31] He argues that users have a configured relationship with a given technology, such that only certain forms of access and use are encouraged. For example, insiders or experts, unlike regular users, can take the back off a computer box and play around with the electronics inside.[32] Users are not given access to the code and algorithms that control Amy, and thus only perform the tasks they are configured to perform. In my analysis, I research if the user of the Amy Ingram software agent is configured and whether this configuration is reflected by the user. The user could, however, also resist this configuration by disagreeing with the maker's representation of Amy, by for example, providing

[28] Ibid., 31.
[29] Ibid.
[30] Ibid., 9.
[31] Ibid., 31.
[32] Ibid.

a negative review. A co-construction may therefore occur due to configuration or to a dual reflection of a discursive utopia. It is the maker who envisions a user and provides platforms, but it is the user who attributes meaning to a technology and defines its usage. Only if both agents share a common vision will the maker's goal be met, thus contributing to an imaginary vision of the technology.

2.2 Defining the Software Agent and Cyborg Literature

In this thesis, I consider the active agency of the maker and user, instead of the predominant agency of the machine. I hereby propose a new discussion concerning the co-constructive roles of user and maker. A "software agent" can be split into different types of agents: e.g., semi-autonomous, autonomous, hybrid, and interface. These terms by themselves are up for debate, and have been discussed extensively by scholars in the fields of software studies and computer studies.[33] Due to time and space restrictions, however, I will limit my study to the following definition of agent: "A person or thing that takes an active role or produces a specified effect."[34] As indicated by B.W. Schermer, the concept of agent can be interpreted to include software environments:

> Computer programs can be used to carry out tasks that have been delegated to them by a human user and act in this respect as an agent, albeit not a human one. They are therefore commonly called software agents, or intelligent agents.[35]

I choose to refer to this definition because it defines the agent as a neutral concept by mentioning its main functionality.

[33] H.S. Nwana, "Software Agents: An Overview," in *Knowledge Engineering Review* 11, no.3 (September 1996);
Hermans, "Intelligent Software Agents on the internet," 1997.
[34] Oxford Dictionaries, *Agent,* 2016.
[35] Schermer, "Software Agents, Surveillance, and the Right to Privacy," 3.

Studies on the interaction between user and software agent predominantly focus on, for example, cyborg discourse,[36] agent discourse,[37] and body-machine relations.[38] In current discourse, agency is rather attributed to the software agent itself than to its users and makers. Therefore, no attention is paid to the surrounding discursive constructions that give meaning to this agent. Furthermore, cyborg discourse "hinges on the belief that human nature (especially intelligence) can be reduced to symbol manipulation and hence replicated in a machine."[39] The discourse focuses mostly on a software agent's possibilities and its ability to replicate a human and not on why the agent has a tendency to do this. By acknowledging the active agency of the maker and user, my aim is to discover how an ideal image of the software agent as a utopia is discursively constructed.

By focusing on the maker and user's discursive co-construction, it becomes clear how the use of linguistic tools can contribute to a utopian configuration of discourse. Furthermore, Bazerman argues that an emergent technology should be understood within a discursive system that gives it "presence, meaning, and value."[40] The meaning and value of a technology can be "scaffolded" through language. According to Zdenek, "[d]iscourse analysis (DA) is a methodology that, when applied to the study of technological systems, directs our attention to the myriad ways in which technologies are 'scaffolded'."[41] Zdenek argues that, according to this view, the ways in which technologies come to be represented, as e.g. humanlike, problem-solver and the like, "are matters to be worked out as part of an ongoing social practice."[42] Similarly, the maker of Amy Ingram scaffolds the software agent by discursively foregrounding the agent since

---

[36] Donna Harraway, "A Cyborg Manifesto," in *Socialist Review* (March 1985);
Zhao, "Humanoid social robots as a medium of communication," 2006;
Sheridan, "Human-Robot Interaction: Status and Challenges," 2016.
[37] Wagner, "Software Agents take the internet as a Shortcut to Enter Society," 2000;
Hermans, "Intelligent Software Agents on the internet," 1997;
Labrou et al., "Agent Communication Languages: The Current Landscape," 1999.
[38] Kenzie Burchell, "Tasking the everyday: Where mobile and online communication take time," in *Mobile Media & Communication* 3, no.1 (2015);
Imar de Vries, *Tantalisingly close: An archaeology of communication desires in discourses of mobile wireless media*, 2012.
[39] Zdenek, "Artificial Intelligence as a Discursive Practice," 340.
[40] Charles Bazerman, *The Languages of Edison's Light* (Cambridge, MA: the MIT Press, 1999), 2.
[41] Zdenek, "Artificial Intelligence as a Discursive Practice," 345;
James Paul Gee, *An Introduction to Discourse Analysis: Theory and Method* (London: Routledge, 1999), 1.
[42] Zdenek, "Artificial Intelligence as a Discursive Practice," 345.

the company's goal is to promote and sell the technology. If the user describes the experience with the software agent using positive descriptive words, the user also scaffolds the agent as an ideal technology. Thus, if the maker aims to promote the technology and the user confirms this optimistic representation, both agents contribute to the "scaffolding" of the software agent. In the experimental beta phase of Amy Ingram the maker and users can contribute to the formation of a utopia that portrays the software agent as a technology that creates new possibilities. To critically examine how and if the users and maker discursively construct a utopian interaction between human and machine, it is important to investigate the use of language and determine what meanings can be attributed to word choice. By acknowledging the important functions of co-construction and discourse, this thesis represents a relevant contribution to current research on the interaction between maker and user in the construction of technology.

2.3 Constructing an Ideological Framework: User, Maker and Utopia

> A utopia becomes a project that spreads throughout society after a long experimental phase. Finally, we see experiments that become the base of a new myth, and discourses that certain authors use to create a watershed utopia or, in other cases, a mask ideology.[43]

In his book *The Internet Imaginaire*, Flichy acknowledges the role of maker and user in the construction of what he refers to as the *imaginaire*, a collective vision "common to an entire profession or sector, rather than to a team or work collective. It concerns not only designers but also users."[44] This technological imaginary, also referred to by Leo Marx and Susan Douglas, is built on a utopian quest for progress.[45] Flichy also refers to separate *imaginaires* as utopias.[46] I argue that the maker and users of an innovative technology, such as the software agent Amy Ingram, can form an *imaginaire* by discursively constructing the technology.

The tendency to attribute human qualities to the software agent, as referred to in cyborg literature, can be clarified by looking at the *imaginaires* Flichy describes in his study on the Internet. The following attributes form a common denominator in the quest for the technological

[43] Patrice Flichy, *The Internet Imaginaire* (Cambridge, MA: the MIT Press, 2007), 12.
[44] Ibid., 4.
[45] Ibid., 5 and 6. Leo Marx describes the technological sublime as an optimistic vision of new technologies, which would facilitate diffusion and use. Susan Douglas focuses on the ideological framework with which the "wireless" evolved.
[46] Ibid., 130. Flichy refers to the before-stated *imaginaire* of "creating a copy of reality" as "this utopia."

imaginary that Flichy refers to: to facilitate the exchange of information and ideas; enhance productivity; enhance the participation of citizens in decision-making; enhance efficiency; and enhance human intelligence.[47] Imar De Vries conducts a comparable historical approach in his analysis of the mobile medium. He refers to dreams that play a role in the discursive construction of new mediums. De Vries also introduces common visions that form part of a technology, such as the potential to contact anyone, anywhere, at any time and the desire to bridge space and time.[48] Martin Lister believes that these desires stem from a modernist belief in social progress, where "new" equals better.[49]

Flichy abandons the traditional perspective that the inventor's work is perceived as the concretization of an initial intuition and argues that a new technical object must be articulated around a specific identity or common vision.[50] This collective vision entails the existence of key ideological beliefs that help explain the adoption of a technical object, such as the computer but also the software agent. In his discussion of the collective vision of the Internet, Flichy focuses specifically on discourses of myth, utopia, and ideology. In this study, I conduct this type of analysis of an ideological framework by describing the process through which the software agent evolves. However, I argue that a common vision is discursively co-constructed by the maker and users. Thus, in the present study, the agency shifts from the ideological concept of the "common vision" to the co-construction of a utopia by maker and users.

Similar to the mobile medium that De Vries discusses, the software agent is presented as the tool to enhance attributes, such as intelligence and productivity.[51] By portraying the software agent as the necessary agent achieve this, the maker and users create a desire for the agent. The discourse concerning the software agent is consequently fueled by high expectations and an illusion of utopian possibilities.[52] As argued by De Vries, "utopian and revolutionary claims

[47] Ibid., 5, 18, 21, 31, 36, 71. From left to right.
[48] De Vries, *Tantalisingly close: An archaeology of communication desires in discourses of mobile wireless media*, 24 and 103.
[49] Martin Lister et al., *New Media: A Critical Introduction* (London: Routledge, 2009), 11.
[50] Flichy, *The Internet Imaginaire*, 2.
[51] De Vries, *Tantalisingly close: An archaeology of communication desires in discourses of mobile wireless media*, 7.
[52] Ibid., 15. De Vries mentions the following regarding mobile media: "What is more, they have quickly come to be considered – sometimes foolishly so – as essential tools to handle almost any problem or situation in life."

appear to be part and parcel of the arrival of new technologies."[53] Flichy refers to six types of utopian or ideological discourse in which the process of creating a new technology can take place; I will refer to the following:

- Watershed utopia: There can be an encounter among technical devices or between designer and user;
- Project utopia: The steps from design to use, and building a mock-up;
- Mask ideology: A successful experiment becomes a myth; it transforms utopia into an ideology.

The framework that Flichy proposes helps structure and clarify the diffusion of a technology. Flichy puts a utopia constructed through discourse at the start of the development of an innovative technology. This shows that the creation of a technology only succeeds if its makers and users believe in the project and the utopia it represents. By envisioning the creation of Amy Ingram as a process it becomes apparent how important the role of utopian thinking is in the diffusion of a technology. A utopia can be discursively constructed by the maker and users, however, it is important to be aware that this construction already takes place before the project is realized (in, for example, the form of a professional edition).

The co-construction of a utopian vision takes place in an inventive phase, which Flichy refers to as the watershed utopia. In this phase the expectations of a technology are formed in an encounter between designer and user. This "process of gestation of innovation" either results in a specific project or fails to be set in reality.[54] An *imaginaire* can result in different projects, for example, the vision of Virtual Reality (VR) as a "copy of reality" is transformed into projects such as flight simulation and the head-mounted display.[55] However, a single project can also embody multiple utopias: The multi-user dungeon (MUD) manages to realize the *imaginaires* of VR as a tool for education, communication and creation.[56] In the case of Amy, the *imaginaires* of the software agent as a new tool for e.g. efficiency and productivity are further developed into a beta product, which is referred to as the project utopia. The maker and users construct this vision through blog posts and reviews on Love Notes. Based on the trials that are performed in

[53] Ibid., 16.
[54] Flichy, *The Internet Imaginaire*, 9.
[55] Ibid., 130 and 134.
[56] Ibid., 149.

the project utopia, the users can make claims about the technology and whether it achieves its set goals. Users thus construct a project utopia and further realize the technology which leads to the release of a professional edition. However, during the project utopia limitations of the technology can be hidden. In this case an experiment is successful because certain aspects are concealed. This representation of a technology distorts the real and thus the *imaginaire* becomes an ideology: "a set of ideas, beliefs and aims that a person or group holds."[57] [58] This ideology that masks reality is defined by Flichy as the mask ideology.

[57] Ibid., 8. Flichy refers to ideology as "a distortion of the real" and the preservation of an identity of a (social) group.
[58] Baker and Ellece, *Key Terms in Discourse Analysis*, 57.

3. Methodology

To determine how the software agent Amy Ingram is discursively co-constructed by the user and maker, this study investigates discourses provided by the maker and users of Amy in detail. It is through these discursive constructions that the expectations of the interaction between user and technology are given shape. This study was conducted by first selecting a corpus (objects of study) using a quantitative approach,[59] and then analyzing the corpus using a qualitative approach.[60]

3.1 An Approach to Discourse Analysis

In this thesis I conducted a discourse analysis to investigate how Amy Ingram is discursively constructed. The "how" in my research question was answered by closely examining aspects of the software agent (such as humanity) and by investigating the different ways in which the discourses of maker and users match, strengthen or weaken each other. By conducting this study, my aim was to show the extent to which the user and maker shape the discourse surrounding Amy Ingram and construct a utopian vision of the software agent. Discourse is a way of talking about and understanding the world (or an aspect of the world). I argue that a discourse does not *reflect* an attitude about the possibility of idealizing the software agent, but it *produces* the software agent as a utopia rather than describing it as such.[61] The discourses of blog posts and user comments bring to life the idea that a software agent can be utopian – or humanlike, a time-saver, or problem-solver.

Social constructivism holds that language does not objectively reflect our world but actively constitutes and shapes our notion of reality. It treats "[w]ritten and spoken language (…) as a reflection of an external world or a product of underlying mental representations of this world."[62] This ability of language to shape our notion of reality, or our notion of what is artificial or natural, represents an important aspect of my analysis of X.ai's Amy Ingram. It shows how important it is to include the influence of the social when discussing technologies. As argued by

[59] The quantitative approach will be described in subchapter 3.2.1.
[60] The qualitative approach will be described in subchapter 3.2.2.
[61] Zdenek, "Artificial Intelligence as a Discursive Practice," 340. The reflection and production of an attitude refers to the approach conducted by Zdenek.
[62] Marianne Jorgensen and Louise Philips, *Discourse Analysis* (London: SAGE Publications, 2016), 107.

James Paul Gee, the function of language is to not only communicate information. Rather, he says, "[l]anguage has meaning only in and through social practices."[63] Regarding Amy Ingram, the interactions between maker and user, user and software agent, and maker and software agent are social practices during which specific meanings are ascribed to the user and the technology.

3.2 Corpus and Key Terms

My corpus consisted of the Twitter Love Notes page and the following X.ai blog posts:[64]

- "Setting Amy up for success"
- "X.ai pros and how they do it: Sudha Jamthe of IOT disruptions Stanford"
- "It's a baby boy: Andrew Ingram"
- "How we design personality through a conversational interface"
- "How to teach a machine to understand us"
- "Cut Siri some slack, she wasn't created to do what we think"
- "How to onboard your AI assistant"
- "The role of AI trainers in teaching a machine to understand us"

During the analysis, I used a mixed methodology of quantitative and qualitative analysis. The latter focused on the method of analysis, and the former focused on the corpus selection.

3.2.1 Quantitative Analysis

A X.ai blog post consists of 200-300 words. The blog posts were chosen manually, based on the technical descriptions of the technology, the portrayal of X.ai's company philosophy and discussion of Amy's attributes. I was aware of my own bias when selecting blog posts and therefore selected those that described not only a utopic portrayal of Amy but also focused on its technological functionality.

Furthermore, the research analysis also focused on a selection of tweets from the Love Notes Twitter page. I made the selection based on a mixed methodology of a corpus-based and a corpus-driven approach.[65] A corpus of 200 tweets (from January 9, 2016 until November 17,

---

[63] James Paul Gee, An *Introduction to Discourse Analysis*, 8.
[64] "X.ai Love Notes," *Twitter*, https://twitter.com/xdotai/timelines/566048694957768704;
"The Latest and Greatest from Team X.ai," *X.ai* (2015-2017), https://x.ai/blog/.
[65] Elena Tognini-Bonelli, *Corpus Linguistics at Work* (Amsterdam/Philadelphia, John Benjamins Publishing Company, 2001), 41. Here I refer to the definition of corpus-driven as conducting a statistical approach by relying on the frequency of words, and the definition of corpus-based as using a corpus of data as a source of examples to test theoretical statements.

2016) was investigated on the Love Notes page. This corpus represents a total amount of 473 tweets (from January 15, 2015 until January 31, 2017). The corpus data were read vertically and fragmentarily, and I focused on repeated events.[66] Due to practical reasons regarding the manual method used to process the tweets, a selection of 100 tweets was made. These tweets were selected based on the presence of descriptive words, either negative or positive, and repetition. The selection was manually counted and analyzed and it was chosen to prevent overlap and repetition in the analysis.[67] The selected tweets represent the overall portrayal of Amy Ingram on the Twitter page. After the selection of the tweets, descriptions of each individual tweet were put into a table to provide an overview. I found that users tend to merely describe Amy using descriptive synonyms of "good." Words such as "better," "superb," "smooth," "impressed," "best" and "excellent" are repeatedly used to describe the interaction with the software agent. Expressions of gratitude such as "thanks" and "thank you" are also mentioned in the tweets.

3.2.2 Qualitative Analysis

Apart from the quantitative approach, a qualitative approach was also used to analyze the maker's and user's discourse. I analyzed the discursive construction of Amy Ingram by first focusing on key terms used in discourse analysis, as discussed by Baker and Ellece.[68] The authors provide a corpus of key terms that I applied to my analysis, which in turn revealed the hidden meanings of words. They offer an accessible overview of the key terms and key thinkers in discourse analysis. However, not all key terms they describe proved to be useful in my method of analysis. Therefore, I selected the following key terms: representation, social deixis, agency, (semi-, controlling and epistemic) modality, imperative, passivated social actor, and personal pronoun. I not only took the discursive influence of maker and users into account, but also looked at configuration: the creation of an "ideal" or "reflexive" user.[69] I first looked at the configuration of the user to clarify how he or she is expected to interact with Amy, and thus indirectly how Amy is expected to function. The analysis will function as a guideline to further determine whether the user's and maker's discursive construction of Amy form an ideological framework.

---

[66] Ibid.
[67] See Appendix: A for the Excel sheets of the data analysis.
[68] Baker and Ellece, *Key Terms in Discourse Analysis*, 2011.
[69] Oudshoorn and Pinch, *How Users Matter: the Co-construction of Users and Technology*, 31.

4. Analyzing Amy Ingram

In an aim to investigate how an understanding of the Amy Ingram software agent is created, this chapter analyzes how the maker and users discursively co-construct the software agent. The analysis of Amy Ingram will be discussed in two separate parts: one focusing on the maker by analyzing selected blog posts, the other focusing on the users by looking at user comments on the Love Notes Twitter page.

4.1 Analysis of the Maker

In this sub-chapter I will examine the maker's discourse, with the aim to investigate how the maker portrays the Amy Ingram software agent and if this constructs a utopian image of the technology.

4.1.1 Shifting Agency from Maker to User to Amy

During my analysis of X.ai's blog posts, I found that X.ai configures the user to act or think in certain ways. This attention to the user is represented in the maker's use of social deixis by referring to the user as "you."[70] The maker seems to give agency to the user by stressing Amy's dependency on him or her. The following passage from a X.ai blog post suggests that the user helps the software agent Amy:

> "If you **want** Amy to do her best work for you, there are a few simple steps that will **help** her do it."[71]

However, this agency is undermined. By examining the ways in which the maker refers to the user and constructs certain expectations of how the user is supposed to interact with the software agent, it becomes clear that a reflexive user is being described. Although the following example presents the users with a hypothetical situation, it indirectly configures the user and illustrates what is expected of him or her while interacting with Amy:

[70] Baker and Ellece, *Key Terms in Discourse Analysis*, 29. Here I refer to "deixis" as "Expressions in language that point to referents."
[71] "Setting Amy Up for Success," *X*.ai, September 2016, https://x.ai/setting-amy-up-for-success/.

> "**You'd** sit down with him and **explain** how you like to manage your calendar."[72]

> "To get her up and running you **need** to have that conversation with her (or her brother Andrew)."[73]

By using the modal verb "would" and the controlling modal verb "need," the maker constructs a way in which the ideal user is expected to interact with the software agent. The use of the controlling modal verb "need" deprives the user of choice. According to Baker and Ellece, "[m]odal verbs often highlight power inequalities or ideology."[74] Here, the power is shifted from user to maker, as the maker is ordering the user to act in a certain way, and the use of epistemic modality (expressing possibility, such as "would") constructs a representation of the user. This representation is the ideal user that the maker has in mind.

The creation of a reflexive user can be placed in Flichy's framework, since the user forms part of the maker's planning process. In the watershed utopia the maker creates a collective vision in a planning process and constructs the main characteristics of a new utopia. Analogue to Flichy's watershed utopia, the maker of the Amy Ingram software agent creates an encounter between the agent and the user, and consequently manifests the belief that an interaction with Amy Ingram is a positive development. The aspects of configuration and reflexivity help form this optimistic vision of Amy before the project is realized. The maker constructs Amy as a passive agent that should be managed, conversed with and set up in a certain way, depriving the software agent of choice. The user, however, also seems to be deprived of choice. The use of imperatives and references to the user as "you" show that the maker has a clear image in mind of how the user is expected to use the technology. These expectations form a new type of interaction between user and software agent:

> "**Think** of her as a **blessing** sent to your life to help you organize your life to focus on what matters most (…)."[75]

---

[72] Ibid.
[73] Ibid.
[74] Baker and Ellece, *Key Terms in Discourse Analysis*, 71.
[75] "X.ai pros and how they do it: Sudha Jamthe of IOT Disruptions." *X.ai*, September 2016, https://x.ai/x-ai-pros-and-how-they-do-it-sudha-jamthe-of-iot-disruptions-stanford/.

> "**Look** into your meetings on what you want to be spending your time on and **make sure** Amy schedules those first."[76]
>
> "**Understand** the type of meetings you typically have and **structure** them into time buckets that Amy can then manage for you."[77]

The maker's use of configuration, modality and the portrayal of the software agent as a blessing constitute an imaginary interaction between Amy Ingram and its users. The use of the word "blessing" relates to the utopian vocabulary that Flichy adopts when he refers to the *imaginaire*. Flichy describes the vision of VR as a "fantasy of leaving one's body" and he refers to utopia as an "illusion" and "fantasy."[78] In this utopia, Flichy portrays the power that technology has over one's life. This discursive formation of a utopia in such an early phase of a technology illustrates how influential discourse can be in the creation of a technology.

The maker of Amy personalizes the blog post by using referents such as "we" and "I," thus creating a framework in which the maker associates with the user. Once it has been clarified that the user is expected to set up Amy Ingram in a certain way, the aspect of agency takes an ambiguous turn. Instead of the user guiding the software agent, the software agent starts to help the user. The user is no longer the active social actor who influences the software agent, but a passivated social actor who is being helped by the software agent.[79] Analogue to Flichy's vision, this is the point where "power" moves from user to the technology of the software agent. X.ai thus discursively gives agency to the software agent:

> "Amy is doing more than **help us** with scheduling. She is **helping all the people** we interact with get sensitized to our future of Human-Machine Interfaces."[80]

---

[76] Ibid.
[77] Ibid.
[78] Flichy, *The Internet Imaginaire*, 145 and 209.
[79] Baker and Ellece, *Key Terms in Discourse Analysis*, 88. Here I refer to "passivated social actors" as "Social actors can be represented as 'doing' things (as actors/agents) or as having things done to them or for them (as goals or beneficiaries of other social actors' actions)."
[80] "X.ai pros and how they do it: Sudha Jamthe of IOT Disruptions." *X.ai*, September 2016, https://x.ai/x-ai-pros-and-how-they-do-it-sudha-jamthe-of-iot-disruptions-stanford/.

> "Amy takes care of all this **for me.**"[81]
>
> "Amy and Andrew **want to understand you**, or at least their version of 'understand.' The more you help them, the better **work they'll do for you.**"[82]

The reflexive user is discursively constructed as wanting a software agent to do work for him or her. Thus, the maker already discursively constructs a situation wherein the software agent is the active agent performing the tasks. By discursively configuring the user as a reflexive user, the maker indirectly constructs an expected interaction with the software agent. It is assumed that the logical interaction with Amy is to delegate tasks to her; Amy is constructed as a helper, as an agent that understands and does the work for the user. The construction of a technology as a helper is common to utopian discourse. Graphic computing is described as a technology that helps humans deal with problems.[83] Similarly, Flichy refers to the electronic highway as a facilitator in the exchange of information.[84] The theme of a new technology as a facilitator is a common aspect that contributes to the creation of an *imaginaire* in the watershed utopia. Thus, the creation of a technology is part of a process that starts with a discourse. This discourse constitutes the functions and characteristics of a new technology. In the case of Amy Ingram the user no longer helps the software agent, and the maker no longer instructs the user, but the software agent helps the user. The software agent is discursively constructed as having agency and as carrying out tasks "by itself." By first giving the user agency, he or she is given the idea of having a say in the delegation of tasks. The maker then enhances the discursive utopia by creating the fantasy that Amy can help and understand its users. The software agent is constructed as a utopic helper that takes over the tasks of the human user, or as Ricoeur mentions: "utopia constitutes an alternative to the power in place."[85]

The configuration of the user and shift of agency symbolize the goal that the maker is trying to achieve: to sensitize the human user to a future with AI and to manipulate him or her into thinking that Amy is the logical solution to all time-management-related issues. Throughout

---

[81] Ibid.
[82] "Setting Amy up for Success," *X.ai*, September 2016, https://x.ai/setting-amy-up-for-success/.
[83] Flichy, *The Internet Imaginaire*, 131.
[84] Ibid., 18.
[85] Ibid., 8.

this linguistically constructed process, the maker also informs the user about the advantages that the technology offers. Words such as "structure," "organize," "work," "help," and "schedule" imply that the software agent offers efficiency, time saving and simplicity. In his discussion of the ideological framework of the Technological Imaginary, Flichy refers to a similar vocabulary in utopian discourse. [86] VR is described as a tool for knowledge, action, creation and a means of communication.[87] Similarly, the Internet is introduced as a tool for time-sharing and an improvement of performance and efficiency.[88] Altogether, the diffusion of new media tends to go hand in hand with the prevailing vision of a "new era" that Flichy defines as a utopia.[89] The creation of a technology is not only fueled by capitalist (Internet), military (Milnet) or academic (NREN) purposes, it is led by a utopian discourse that is already constituted before the execution of a project.[90] This shows that a new technology is part of a process in which a utopian vocabulary is adopted to construct an ideology. As argued by Baker and Ellece, "[l]anguage is one way that ideologies are constructed, maintained and challenged."[91]

4.1.2. Humanizing the Software Agent

In the previous sub-chapter, it became clear that Amy Ingram's maker discursively constructs a reflexive user who is expected to interact with Amy in a certain way. By doing so, the maker presents the software agent as an active social actor that carries out tasks and helps the user. X.ai also represents the software agent's agency by portraying it as equal to a human personal assistant. The maker states that the user can interact with the agent in the same way as he or she would interact with a human. In this watershed utopia the software agent is anthropomorphized, defined by Encyclopedia Britannica as "[t]he interpretation of nonhuman things or events in terms of human characteristics."[92] The humanization of a technology is not a novel aspect in the creation of a new technology. Similar to Amy Ingram, VR technology also focuses on the

[86] Ibid., 5 and 6.
[87] Ibid., 129.
[88] Ibid., 36.
[89] Ibid., 2.
[90] Ibid., 186, 58 and 20. Flichy refers to the initial purposes that the information highway, NREN and the Internet served.
[91] Baker and Ellece, *Key Terms in Discourse Analysis*, 57.
[92] Encyclopaedia Britannica, *Anthropomorphism*, 2016.

relationship between humans and machines in order to immerse the human with technology.[93] The humanlike nature of Amy is used as a coping mechanism to bridge the distance between human and machine. This is a typical aspect of how the maker aims to incorporate change in the user's daily life and sensitizes the user with the software agent. Thus, humanization increases the possibility that the users will interact with the technology in the experimentation phase. The interpretation of the software agent as human is portrayed in the following examples:

> "And **just like a human assistant**, after Amy gets into the swing of things (…)."[94]

> "I treat **her** as my admin **like I would treat a real person** (…)."[95]

The maker repeatedly uses gendered pronouns to refer to the artificially intelligent Amy Ingram, downplaying the agent's artificiality by positioning the technology as an autonomous, gendered agent. The "humanity" of Amy Ingram is also emphasized, not only because the agent is given a name and referred to as "she," but also because it is attributed qualities deemed humanistic, such as "to understand" and to "be aware." In a similar vein, the maker creates a symbiosis between a human user and a "seemingly human" software agent by attributing several human characteristics to the bot:

> "(…) a new addition to our **family** today, Amy's **twin brother**, Andrew Ingram."[96]

> "This **sibling** duo have the exact same skill set and are fully **aware** of what the other assistant is working on."[97]

The maker emphasizes that it is important for the user to be able to sympathize with the software agent and vice versa. Therefore, the company imbues the software agent Amy with empathy and

[93] Flichy, *The Internet Imaginaire*, 132.
[94] "Setting Amy up for Success," *X.ai*, September 2016, https://x.ai/setting-amy-up-for-success/.
[95] "X.ai pros and how they do it: Sudha Jamthe of IOT Disruptions," *X.ai*, September 2016, https://x.ai/x-ai-pros-and-how-they-do-it-sudha-jamthe-of-iot-disruptions-stanford/.
[96] "It's a Baby Boy – Andrew Ingram," *X*.ai, March 2015, https://x.ai/its-a-baby-boy-andrew-ingram/.
[97] Ibid.

a certain level of compassion to help her achieve her goal (to quickly schedule appointments and meetings). X.ai does this by attributing four key personality traits to Amy: politeness, professionalism, friendliness and clarity.[98] The maker has programmed this level of humanlike features into the agent for it to interact as naturally as possible. However, this humanistic, autonomous portrayal of Amy masks the fact that human engineers still intervene if the agent misinterprets or does not understand actions. The creation of an illusion and attribution of humanlike features to achieve a natural interaction is also discussed by Flichy in relation to VR. He describes VR as a copy of reality that aims to improve interaction, human-machine dialogue and communication.[99] Similarly, X.ai attributes compassion and understanding to Amy to enable a fluent interaction and natural form of communication between Amy and its users.

4.1.3 Anthropomorphism as the Way Forward

X.ai's blog posts make it apparent that there is a clear set goal to make Amy Ingram as human as possible. This is not only portrayed in the aforementioned gendered pronouns and in the humanistic attributes, it is also literally described. X.ai devotes several blog posts to Amy Ingram's technological functionalities. Here it is clarified that aspects of humanization, fluency and naturalness in communication are key to the interaction with the software agent:

> "Very early on, x.ai made a deliberate decision to **humanize** our AI autonomous agents. We wanted our customers to be able to communicate **as naturally as possible.**"[100]

> "We've given Amy and Andrew a human-seeming interface (in this case textual voice) **because that humanness helps our customers achieve their goal**—getting a meeting on the calendar."[101]

The attribution of human characteristics to the bot has proven to be decisive in helping X.ai achieve its goals, which focus on speed and efficiency. A close examination of the blog posts

[98] Ibid.
[99] Flichy, *The Internet Imaginaire*, 129.
[100] "How x.ai Designs Personality through a Conversational Interface," *X*.ai, November 2016, https://x.ai/how-we-design-personality-through-a-conversational-interface/.
[101] Ibid.

mentioned above reveals that the maker deliberately constructs specific expectations of the technology. By using certain (descriptive and possessive) words, the maker discursively constructs expectations not only of the software agent, but also of how the user is meant to understand this technology and interact with it. Thus, the maker carefully forms a discursive construction of Amy as the ultimate form of AI. This is emphasized by referring to the AI technology as being capable of things that the human is supposedly not capable of. The reference to the software agent as a way to complete the human being is common to utopian discourse. In the discussion of MUDs the bot Julia is mentioned to have abilities "most humans lack."[102] The human user of Amy is referred to as faulty or lacking and thus in need of AI:

> "The fact that humans are notoriously **imperfect communicators** (…)."[103]
>
> "Setting Amy up for success: **she never forgets.**"[104]

Analog and antiquated forms of time management and the manual performance of tasks are referred to negatively. Thus, Amy is the solution to all problems; AI is a necessary and positive technological development:

> "**Worst part**: managing time and scheduling calls/meetings and keeping track of rescheduled meetings. All that was before Amy."[105]
>
> "By definition, these agents complete entire jobs ***by themselves***, which means **they must learn** to understand us and our objectives."[106]

By portraying Amy's set-up as consisting of "simple steps" and stating that "it's [interaction with Amy] easy," the complexity of the technology and its submission to potential failure is

[102] Flichy, *The Internet Imaginaire*, 148.
[103] "How to Teach a Machine to Understand Us," *X.ai*, February 2016, https://x.ai/how-to-teach-a-machine-to-understand-us/.
[104] Ibid.
[105] "X.ai pros and how they do it: Sudha Jamthe of IOT Disruptions," *X.ai*, September 2016, https://x.ai/x-ai-pros-and-how-they-do-it-sudha-jamthe-of-iot-disruptions-stanford/.
[106] "How to Teach a Machine to Understand Us," *X.ai*, February 2016.

completely undermined.[107] The possibility that Amy could misinterpret or not "understand" an interaction is mentioned, but is also rectified by directly referring to the idea that humans are also not perfect, and that Amy therefore works in the same way. This idea of comparing the dysfunction of the software agent to a human intensifies the maker's utopian vision. The software agent is presented as an agent that minimizes time-consuming back-and-forth with guests and can make sense of millions of e-mails.[108] [109] The software agent not only performs tasks, but also saves the user time so that he or she can use that time for "what matters most."[110] Thus, the maker implies that spending time on scheduling appointments and meetings is a waste of time.[111] Moreover, the maker suggests that the only way to delegate these simple tasks as fast as possible is to make the interaction seem natural and fluent. This is achieved by humanizing the artificial agent Amy Ingram.

The aspect of humanizing a software agent is also discussed in cyborg literature, where the agent is given power over the human. Similarly, throughout this analysis I have shown that, through discourse, the maker conveys the idea that the software agent has power over the user. Amy Ingram is constructed as a facilitator, a blessing and an active agent that offers advantages such as efficiency, time-saving and simplicity. The maker thus constructs Amy as an embodiment of multiple *imaginaires* by adopting a vocabulary common to utopian discourse. The user is however constructed as a passive reflexive user that needs to interact with Amy and be helped. Altogether, the humanization and creation of an illusion form part of an *imaginaire* in the watershed utopia with as goal to become reality and accessible to users in the project utopia. The designed utopia of Amy Ingram is executed in the form of a beta version that is made available to a selected group of users. By considering the different phases through which a technology develops, the power of the *imaginaire* is placed in perspective. A utopia is not ungraspable, it can be created by maker (and user) and lead to the realization of a project such as Amy Ingram.

---

[107] "Setting Amy up for Success," *X.ai*, September 2016.
[108] "X.ai pros and how they do it: Sudha Jamthe of IOT Disruptions," *X.ai*, September 2016.
[109] "How x.ai Designs Personality through a Conversational Interface," *X*.ai, November 2016.
[110] "X.ai pros and how they do it: Sudha Jamthe of IOT Disruptions." *X.ai*, September 2016.
[111] Ibid. Here, the maker says they want to minimize "Back and forth with guests."

4.2 Analysis of the User

In an aim to investigate how an understanding of the Amy Ingram software agent is created, this chapter analyzes how its users discursively construct the software agent. To understand how Amy Ingram is shaped by discourse, in this case focusing specifically on the users' Love Notes Twitter feed, a corpus of user comments was analyzed. Additionally, the analysis of the users is related to the findings of the makers' analysis. Together, the analysis of the maker and the users show how Amy Ingram is discursively co-constructed.

4.2.1 Inviting the Users to Contribute

The user comments on Love Notes are repeatedly mentioned in the maker's discourse. This illustrates a clear link between the maker's and the user's discourses. In a set of blog posts, the maker refers to a screenshot of user comments.[112] Thus, an interrelation is created, where the user's comments help to confirm the maker's point. This is where the *imaginaire* designed by the maker in the watershed utopia is successfully put to use in the project utopia. The beta version of Amy Ingram exemplifies how a utopian discourse can transform into a tangible project and affect the general understanding and reception of a technology.

The comments produced by the users strengthen the maker's utopia throughout its blog posts: that Amy saves time, enables productivity and is smarter than the human user. Consequently, the vision of Amy Ingram is not necessarily reconstructed in the project utopia, as defined by Flichy, but rather intensified and expanded.[113] The Twitter page allows the users to make claims about the technology based on their interactive experiences with the beta product of Amy.[114] The agent is described using the word "love," giving the interaction with Amy an emotional connotation. Thus, the positive reception on the Love Notes page portrays an optimistic vision of the Amy Ingram technology. Optimism is a common aspect in utopian discourse: the vocabulary of the sublime suggests that an optimistic vision can facilitate the

---

[112] "How x.ai Designs Personality through a Conversational Interface," *X*.ai, November 2016, https://x.ai/how-we-design-personality-through-a-conversational-interface/;
"Cut Siri some Slack. She wasn't created to do what we think," *X.ai*, August 2016, https://x.ai/cut-siri-some-slack-she-wasnt-created-to-do-what-we-think/.

[113] Flichy, *The Internet Imaginaire*, 11. Flichy describes the experimental phase as "a phase in which the utopian discourse is reconstructed."

[114] Ibid.

diffusion and use of technologies.[115] The positive reception therefore facilitates the execution of the project. Similarly, the maker of Amy Ingram influences the portrayal of the agent with the creation of a platform aimed at positive experiences with the technology. By giving this platform the biased name "Love Notes," the maker is already determining a positive reception of Amy and discouraging negative comments:

> But we are inspired by the possibility of democratizing the personal assistant and by all of **the love our beta customers have shown us** along the way, as we work to bring Amy and Andrew to life, and to the rest of the world.[116]

This aspect of "love" is directly reflected by the users, as portrayed in the following user comment:

> "I think I'm **falling for Amy**. She understands me like no one ever has." (Dec. 15, 2016)

Amy is discursively constructed as a woman, as a human that can be loved and married with. Words such as "falling for," "love," and "marry" are often used when referring to the software agent. This implies that the user confirms the maker's expectations: For Amy to seem so humanlike and for the interaction to be so natural, the software agent is considered human.

4.2.2 Describing the "Wow"-effect of Amy

The user has now discursively constructed the software agent as being a human by using words that describe humanistic attributes. The users' discursive construction of this "humanlike" Amy Ingram is constant: users often use positively inscribed words when referring to their interactions with Amy. The software agent is presented as a human agent that has influence on the users' lives. The words used to describe the technology and the results of interacting with it often greatly resemble the *imaginaire* constructed by the maker and vocabulary used to promote the technology. The positively described experiences are represented in the following tweets:

[115] Ibid., 5.
[116] "How to Teach a Machine to Understand Us," *X.ai*, February 2016, https://x.ai/how-to-teach-a-machine-to-understand-us/.

> "… Very **smooth** service, I have to say I was **impressed**! :D" (Nov. 17, 2016)
>
> "… AI can do **better.** I am still **in awe** with how x.ai personal digital assistant schedules meeting **magically**." (Nov. 15, 2016)

In the user comments, words such as "magic," "wow," and "fantastic" are often used, thus resembling an emotional response to the AI technology. The connotations of these words express a positive attitude. The word "smooth" indicates a fluent interaction, a fast and efficient usage, which is also an important factor portrayed in the maker's discourse. By describing the technology through mystical terms such as "magic" the users construct a vision of Amy Ingram as the ultimate, autonomously functioning agent. The word "magic" implies a sense of something that cannot be reached. This use of a mystical vocabulary is also referred to by Flichy in his discussion of the technological imaginary. He refers to dreams,[117] fantasy and illusion implying something that cannot be reached.[118] Flichy however also argues that a utopia is not necessarily something ungraspable, but a process that allows a full range of possibilities to be explored.[119] The user comments of Amy reflect this vocabulary and the process leading to a utopia. However, since the users adopt words that imply Amy Ingram is unrealistic and reflect the maker's portrayal of Amy as autonomous, the project utopia seems to have transformed into a mask ideology. In this phase reality is being masked and certain aspects are hidden or concealed to promote the new technology.[120] Similar to the constructed *imaginaire* of VR that Flichy describes, the users of Amy Ingram construct an *imaginaire* where the fact that technology is also a human construction is concealed.[121]

4.2.3 Humanizing and Giving Agency to Amy

An important aspect of the mask ideology is the humanization of the software agent, since it masks the artificiality of Amy. Users refer to the agent as Amy or Andrew, often using personal pronouns such as "he" or "she." This coincides with the humanistic image of Amy that the maker

[117] Flichy, *The Internet Imaginaire*, 23 and 169.
[118] Ibid., 10 and 149.
[119] Ibid., 9.
[120] Ibid., 11.
[121] Ibid, 154.

portrays in its blog posts. Amy's humanness seems to be considered a positive aspect of the technology. For instance, trust, a characteristic often attributed to the human, is used to describe the agent:

> "… I **trust** Amy more of course. **She's** my #1." (Apr. 28, 2016)

Amy's power over the user is referred to, treating the user as passive and the technology of Amy as active. This can be seen in the comments below, where the user gives Amy the power to change his or her life:

> "… Had a chance to schedule through @xdotai artificial intelligence assistant. I literally **thought it was a person**." (Oct. 25, 2016)

> "… **she's amazing** and has **changed my life**/is productive even when I'm not." (Sep. 6, 2016)

> "… When I first interviewed @DennisMortensen [maker] he said **Amy is smarter than us**. She remembers things. Blown away how right he was!" (Aug. 2, 2016)

The comments represent a social construction of technology, where the user is delegating so many tasks to a self-learning machine that his or her ability to make decisions or be productive becomes irrelevant. The delegation is not only taking place in the interaction between the user and Amy, but is also referred to by the user when reviewing the agent. The user gives agency to Amy by giving the agent influence on his or her life. Together with the maker, the user co-constructs a vision that this is the ideal technology that will not only solve people's problems, but will also take over their tasks. Thus, the reflexive user constructed by the maker forms an interrelation with the actual user who is represented in Twitter Love Notes. In addition, the users emphasize humanness and thus the wish for a technology to be as fluent and natural as possible. Amy is referred to as being "smarter" than "us" [humans], implying that this is what the user is impressed by and perhaps looking for in a software agent: technology that is smart, productive and able to solve problems even when the human cannot.

However, this also masks the fact that Amy Ingram is not human nor fully autonomous: a team of human engineers checks Amy's every action. This helps clarify what the users describe as "magic": the software agent technology is discursively constructed as autonomous, magic and automatic, strengthening the mask ideology. It is important to be aware of this mask ideology taking place after the experimentation phase of the project utopia, because it shows that users of the professional edition of Amy are being confronted with an incomplete vision of the agent. The vision that the maker constructs is reflected by its users, however, it is based on a selective truth and a biased platform. This shows that it is important to realize that this new AI technology is not necessarily better, it rather attempts to create a new type of interaction by concealing certain aspects.

4.2.4. The Representation of the "Godlike" Amy Software Agent

From the characteristics attributed to the software agent, we can gather that Amy can change people's lives and is smart, humanlike and trustworthy. She saves time, solves problems, and appears to be magical, godlike and dreamlike:

> "… Amy is a **godsend**. She has taken away one of my time-sucks. I'm more productive now." (Apr. 26, 2016)

However, this magic can sometimes also be experienced with suspicion: "… It's creepy how good this is…" (Apr. 11, 2016.) In this comment, a user acknowledges Amy's AI and experiences it as a "creepy" confrontation with the possibilities of AI. Given that Amy's humanlike nature is mentioned often in the users' comments, it seems to be an important factor that encourages fluency, efficiency and speed. As mentioned in the comment below, just as in the maker's discourse, Amy is being given power over the user. She helps users, eliminates their time-management struggles and changes their lives. By making such powerful statements, the users cede control to the artificially intelligent agent, thus downplaying the responsibility and power they have over their own actions.

> "…You guys are **amazing**, Amy is making my life much more **simple**." (Sep. 23, 2016)

The user above indicates that his life is simpler, thus considering this to be an important feature of the software agent. Simplicity relates to Flichy's mention of Engelbart:

> He believed that machines should enable people to perform very simple intellectual operations, such as writing and correcting a written text. Individuals could thus spend less time drafting texts and devote part of their energy to more complex intellectual tasks.[122]

Therefore, the idea of simplifying life relates very much to humans not having to perform simple tasks themselves, giving them more time to devote themselves to other things. This "ease" or simplicity is also referred to in the following comments: "The ease of navigating time differences. It's a huge time save," (Sep. 15, 2016) and "She makes setting my meetings so easy…" (May 12, 2016). X.ai discusses simplicity in its blog post from Sep. 16, 2016: "The nice thing about all this is that it's easy, and once you tell Amy something, she never forgets."[123] The word "easy" is a synonym for "simple," thus relating to the user comments above, where an innovation would serve to create a simple or easy symbiosis and thus facilitate the performance of other tasks and save time altogether.

Altogether, the user and maker co-construct a utopian image that coincides with the utopian vocabulary that Flichy describes. The analysis of the users' comments provides numerous similarities with the main arguments of the maker's analysis. The maker configures the user to provide amicable comments by referring to the Twitter page as "Love" Notes and by describing Amy as a "blessing." This configuration is reflected by the actual users in their mention of words such as "love" and positively inscribed words such as "magically" and "better." This positive reception contributes to an optimistic vision common to utopian discourse. The user also continually constructs Amy as being humanistic by referring to the agent as "her" and by ascribing human attributes to it. Additionally, the agent is referred to as a life changer and is constructed as an autonomous agent that carries out tasks for the user. Thus, the user attributes active agency to the software agent. It can therefore be stated that the user reflects the common vision that is constructed by the maker: Amy Ingram as a humanistic, problem-solving, life-changing and godlike technology. The users however strengthen the humanity and agency of the software agent and add a sense of impossibility to the maker's vision by adopting a mystical

[122] Patrice Flichy, *The Internet Imaginaire*, 40.
[123] "Setting Amy up for Success," *X.ai*, September 2016, https://x.ai/setting-amy-up-for-success/.

vocabulary. Conclusively, this utopia reflects an unrealistic and ideologically formed image. Flichy also refers to this when he states that a technology can "at once [be] a watershed utopia and a project utopia (…). It is an ideology that legitimizes new business practices but that also masks the huge inequalities and major uncertainties characterizing this new economic activity."[124] It is within this ideological framework where a project that once formed a utopia is partly realized but becomes an ideology that masks the reality and also mobilizes actors (such as the maker, the user, and participants).[125]

[124] Patrice Flichy, *The Internet Imaginaire*, 203.
[125] Ibid., 88.

5. Conclusion

This study focused on the software agent Amy Ingram. Due to an increasing tendency to delegate tasks to AI agents, such as Amy, human users of AI technology relinquish part of their direct control. This control is substituted with indirect control through a software agent technology that is designed by engineers. The engineers, or makers of a technology, however, program the software agent based on a particular vocabulary and the limited capabilities thereof. These limitations present the delegation of tasks to software agents with problematic implications. This thesis was conducted to investigate how a utopian understanding of the software agent is constructed through discourse, and which values and functionalities maker and users deem important when looking at artificially intelligent technologies.

In this thesis, the roles of both maker and the users in the discursive construction of Amy Ingram were analyzed. The idea that the maker plays a decisive role in the reception of a new technology is not a new concept. The influence of the maker is integrated into the algorithms on which artificially intelligent agents function. Therefore, it is not surprising that this study found that the maker has an intended use for the technology, and thus also has a reflexive user in mind. Hence, the maker mobilizes discourse to construct this reflexive user and imagined use of the technology. However, this study also researched the active role of the user in discourse. It was found that the user attributes meaning to the Amy Ingram software agent through user comments on the Love Notes page. Thus, this study examined how Amy is discursively constructed by maker and users, with the aim of understanding the agent's qualities, limits, and possibilities.

5.1 Results

This study demonstrates that Amy Ingram is discursively constructed on different levels. First, the maker discursively shifts agency from the user to the software agent by applying linguistic tools such as configuration, social deixis, modality, and the passivated social actor. Amy is thus discursively constructed as an active agent and autonomously functioning helper. The users agree with their role of passivated social actor by acknowledging the effect that the software agent has on their lives. Second, the users and maker anthropomorphize the agent by attributing human characteristics to it: understanding, awareness, trust, gender and intelligence. Third, Amy is referred to as a "godlike" agent that can outperform a human. The human user is linguistically constructed as deviant and passive, requiring the help of an artificially intelligent agent for the

delegation of tasks. Moreover, characteristics deemed "human" are discursively constructed as necessary tools to ensure a fluent, natural, and quick interaction between the user and software agent. Amy is described as an agent that can solve problems, save time, and, as mentioned by users, change lives. Thus, it can be stated that the users, both the reflexive user as envisioned by the maker and the actual user, and maker co-construct *imaginaires* that portray Amy as a utopia. Amy is ideologically shaped as a technology that can explore new possibilities with human-machine interaction, enhanced intelligence and enhanced productivity. Conclusively, the maker and users contribute to a utopian discursive construction of the software agent by adopting a utopian vocabulary and creating an *imaginaire*.

5.2 Academic Implications

The results of this study portray a relevant contribution to current academic debate on topics such as the user, software agent and anthropomorphism. Schermer mentions that part of the users' control is relinquished with indirect control through the software agent. However, it is important to note that the users themselves attribute this control to the agent through discourse. The delegation of control is not something that is done *to* the users but rather given shape *by* the users. Adding to Akrich's and Flichy's argument that both designers (makers) and users are active agents in the development of technology, or in the creation of an *imaginaire* in the case of Flichy, it is argued that these agents construct a discourse (blog posts and Twitter reviews) that creates a utopian understanding of the technology. In contrast to Flichy, this thesis shows that the *imaginaire* is not the active agent that influences the construction of a technology: The users and maker are the active agents that produce an *imaginaire*. Oudshoorn and Pinch discuss the role of either maker or user in the construction of a technology, but do not consider the possibility that both agents can co-construct a technology simultaneously. This study hereby introduces a novel perspective on how not only makers or users, but both agents matter. In this sense, Woolgar's concept of configuration forms an important role in creating an understanding of the influence of the maker. The maker envisions a user and this influences the users' reception of the technology. In the case of Amy Ingram, the envisioned reflexive user coincides with the actual user: both users form a portrayal of the software agent that is similar to the makers' portrayal.

The discourse analysis that was conducted in this study proved to be very useful. By conducting a quantitative approach of the Love Notes page the most frequently occurring

attributes were discovered, thus providing the analysis with main themes of e.g. anthropomorphism and agency. However, the manual approach that was conducted to select a corpus of blog posts and user comments was prone to subjectivity, as only the linguistic terms that proposed a judgement of value were selected. The qualitative approach provided the study with discursive key terms that determined the main arguments throughout the analysis. Additionally, the ideological framework proposed by Flichy helped portray the important role of the *imaginaire* in the creation of a technology. The framework also provided structure for the analysis and defined the process through which Amy Ingram is discursively constructed. Overall, the discourse analysis presented sufficient data to answer the main research questions. However, the downside of this method is that argumentation remains quite theoretical as it does not investigate practical situations that an ethnographic or social approach would.[126]

[126] Suggestions for a different methodology are referred to in chapter 6.2.

6. Discussion

6.1 Reflections and Limitations

A limitation of the conducted discourse analysis is its focus on one research object. A study of multiple software agents would provide more counter examples to either strengthen or weaken the stated arguments and thus lead to a more reliable conclusion. However, due to time and space restrictions, it was not possible to study more objects. This study also focuses on fixed definitions of terms such as "agency," "utopia" and "software agent," since there was no opportunity to delve into the philosophical implications of these terms. Similarly, discussions about terms such as "communication" and "ideology" could fill entire studies. Nevertheless, by delving into a single theory, a starting point is provided for a critical discussion regarding technological progress and the ideology that it serves. In addition, by using a discursive approach, this study was limited to the use of language and discursive constructions.

Another limitation of the research is related to the Love Notes Twitter page. It is unknown whether these tweets are selected by the maker, or whether the maker simply posts all the tweets that refer to X.ai in the text. Thus, it is unknown whether an algorithm determines the selection of tweets and the portrayal of Amy Ingram on the Twitter page. If an algorithm were to be used, this would also clarify the positive reception of Amy on the Twitter page. However, information regarding the algorithms or selection process has not been made available online.

6.2 Suggestions for Further Research

Much remains to be researched concerning the evolving topic of the software agent. As a starting point, this study has found that clearer definitions of terms are needed to refer to artificially intelligent agents. Terms such as "conversational interface," "bot," "software agent," "(semi-) autonomous agent" and so forth spark numerous points of debate, and the mere mention of such words leads to confusion and discussion. Once terms are clearly defined and chosen, it is also necessary to clarify how AI works and delve into the problematic implications algorithms entail, such as bias and legal and ethical issues.

A suggestion for a different methodology is an ethnographic approach. By conducting interviews and organizing focus groups, users of a software agent can be asked questions regarding what drives them to post reviews online. For instance, it is possible that users on the

Love Notes Twitter page of X.ai would rather post a positive review than a negative review. This could explain why the reception of Amy Ingram is dominantly described a positive.

This study specifically focused on a single-agent bot, to whom the single task of managing appointments is delegated. However, to delve into the implications of AI and the creation of a utopia, studies must also focus on multi-agency bots such as Google Now and Microsoft's Cortana.[127] These bots take over numerous human tasks, potentially problematizing the human's agency and authority. Therefore, it is necessary to investigate the affordances of (multi-agency) software agents, how culturally defined these agents are, and how this cultural influence plays a role in the interactions between humans and machines.

Finally, the emphasis placed here on discursive practices forms a starting point for further research. It is important to consider the influence of discourse and of all actors concerned (maker, user and software agent) and to include a platform analysis in the study of discourses. Platforms, design and discourse all play a major role in the portrayal of a technology. It is necessary to become aware of how technologies are "represented" through media, platforms and people and to realize how people are unconsciously influenced by the assumptions and biases of others. Not only researchers, but also makers and users must become more knowledgeable, aware and conscious of how technologies that have the potential to impact users' day-to-day lives are constructed and used.

[127] Microsoft Support, "Cortana," *Microsoft* (2016-2017), https://support.microsoft.com/en-us/help/17214/windows-10-what-is.

Bibliography

Apple. *Siri*. Apple inc., 2016-2017: http://www.apple.com/ios/siri/.

Baker, Paul, and Sibonile Ellece. *Key Terms in Discourse Analysis*. London: Continuum, 2011.

Bazerman, Charles. *The Languages of Edison's Light*. Cambridge, MA: the MIT Press, 1999.

Bellegarda, J.R. "Spoken Language Understanding for Natural Interaction: The Siri Experience." *Natural Interaction with Robots, Knowbots and Smartphones* (2014): 3-14.

Bierend, Doug. "The Conversation about VR Struggles to Get Real." *Motherboard* (November 2016): http://motherboard.vice.com/read/the-conversation-about-vr-struggles-to-get-real.

Burchell, Kenzie. "Tasking the everyday: Where mobile and online communication take time." In *Mobile Media & Communication* 3, no.1 (2015): 36–52.

Claeys, Gregory. *The Cambridge Companion to Utopian Literature*. Cambridge: Cambridge University Press, 2010.

El-Ouazzane, Remi. "Growing Up in Generation AI." *TechCrunch* (September 2016): https://techcrunch.com/2016/09/03/growing-up-in-generation-ai/

Flichy, Patrice. *The Internet Imaginaire*. Cambridge, MA: the MIT Press, 2007.

Gee, James Paul. *An Introduction to Discourse Analysis: Theory and Method*. London: Routledge, 1999.

Google. *Google App*. Google Inc., 2016-2017: https://www.google.com/search/about/.

Guthrie, Stewart E. "Anthropomorphism." *Encyclopaedia Britannica* (April 2008): https://www.britannica.com/topic/anthropomorphism

Harraway, Donna. "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century." In *Socialist Review* (March 1985): 173-204.

Hermans, Björn. "Intelligent Software Agents on the internet: An inventory of Currently Offered Functionality in the Information Society and a Prediction of (Near) Future Developments." In *First Monday* 2, no.3 (March 1997): http://firstmonday.org/ojs/index.php/fm/article/view/514/435

Huet, Ellen. “The Humans Hiding Behind the Chatbots.” *Bloomberg* (April 2016): https://www.bloomberg.com/news/articles/2016-04-18/the-humans-hiding-behind-the-chatbots

Jolley, Charles. “AI101: The Multi-Agent Problem.” *Medium* (July 2016): https://medium.com/teamozlo/assistants-and-the-multi-agent-problem-242d29cc11f5#.rq13u8jpd

Jørgensen, Marianne, and Louise Phillips. *Discourse Analysis: as Theory and Method*. London: SAGE Publications, 2016.

Kharpal, Ajun. “Elon Musk: Human must merge with machines or become irrelevant in AI age.” *CNBC* (February 2017): http://www.cnbc.com/2017/02/13/elon-musk-humans-merge-machines-cyborg-artificial-intelligence-robots.html.

Labrou, Yannis, Tim Finin and Yun Peng. “Agent Communication Languages: The Current Landscape.” In *IEEE Intelligent Systems* (April 1999): 45-52.

Lister, Martin, Jon Dovey, Seth Giddings, Iain Grant, and Kieran Kelly. *New Media: A Critical Introduction*. London: Routledge, 2009.

Neff, Gina and Peter Nagy. “Talking to Bots: Symbiotic Agency and the Case of Tay.” In *International Journal of Communication* 10 (2016): 4915-4931.

Nwana, H.S. “Software Agents: An Overview.” In *Knowledge Engineering Review* 11, no. 3 (Sept 1996): 1-40. http://agents.umbc.edu/introduction/ao/

Oudshoorn, Nelly, and Trevor Pinch. *How Users Matter: the Co-Construction of Users and Technology*. Cambridge, MA: the MIT Press, 2003.

Oxford Dictionaries. “Agent.” Oxford University Press (2016): https://en.oxforddictionaries.com/definition/agent

Sheridan, Thomas B. “Human–Robot Interaction: Status and Challenges.” In *Human Factors* 58, no.4 (June 2016): 525–532.

Reich, Dan. “Retooling AI for the Workplace.” *TechCrunch* (August 2016): https://techcrunch.com/2016/08/28/retooling-ai-for-the-workplace/

Schermer, B.W. “Software Agents, Surveillance, and the Right to Privacy: A Legislative Framework for Agent-Enabled Surveillance.” Dissertation PhD, Leiden University Press, 2007. https://openaccess.leidenuniv.nl/bitstream/handle/1887/11951/Thesis.pdf?sequence=1

Sheridan, T B. “Human-Robot Interaction: Status and Challenges.” In *Human Factors: the Journal of the Human Factors and Ergonomics Society* 58, no. 4 (2016): 525–32.

Support, Microsoft. *Cortana*. Microsoft, 2016-2017: https://support.microsoft.com/en-us/help/17214/windows-10-what-is.

Tognini-Bonelli, Elena. *Corpus Linguistics at Work*. Amsterdam/Philadelphia: John Benjamins Publishing Company, 2001.

Twitter. “X.ai Love Notes.” https://twitter.com/xdotai/timelines/566048694957768704

Vries, Imar de. *Tantalisingly close: An archaeology of communication desires in discourses of mobile wireless media*. Amsterdam: Amsterdam University Press, 2012.

Wagner, Dirk. “Software Agents take the internet as a Shortcut to Enter Society: A Survey of New Actors to Study for Social Theory.” In *First Monday* 5, no.7 (July 2000): http://firstmonday.org/ojs/index.php/fm/article/view/771/680

Woolley, Samuel C., Danah Boyd, Meredith Broussard, Madeleine Elish, Lainna Fader, Tim Hwang, Alexis Lloyd, Gilad Lotan, Luis Daniel Palacios, Allison Parrish, Gilad Rosner, Saiph Savage, and Samantha Shorey. “How to Think About Bots.” *Motherboard* (February 2016): http://motherboard.vice.com/read/how-to-think-about-bots

X.ai. *Help - FAQ*. X.ai, 2015-2017: https://x.ai/faq/

X.ai. *The Latest and Greatest from Team X.ai*. X.ai, 2015-2017: https://x.ai/blog/

—. “It’s a baby bow - Andrew Ingram.” *X.ai*, March 2015: https://x.ai/its-a-baby-boy-andrew-ingram/

—. “Cut Siri some slack. She wasn’t created to do what we think.” *X.ai*, August 2015: https://x.ai/cut-siri-some-slack-she-wasnt-created-to-do-what-we-think/

—. “The role of AI trainers in teaching a machine to understand us.” *X.ai*, September 2015: https://x.ai/the-role-of-ai-trainers-in-teaching-a-machine-to-understand-us/

—. “How to teach a machine to understand us.” *X.ai*, February 2016: https://x.ai/how-to-teach-a-machine-to-understand-us/

—. “X.ai pros and how they do it: Sudha Jamthe of IOT Disruptions.” *X.ai*, September 2016: https://x.ai/x-ai-pros-and-how-they-do-it-sudha-jamthe-of-iot-disruptions-stanford/

—. “Setting Amy up for success.” *X.ai*, September 2016: https://x.ai/setting-amy-up-for-success/

—. “Launching the professional edition.” *X.ai*, October 2016: https://x.ai/launching-the-professional-edition/

—. “How we design personality through a conversational interface.” *X.ai*, November 2016: https://x.ai/how-we-design-personality-through-a-conversational-interface/

—. “How to onboard your AI assistant.” *X.ai*, December 2016: https://x.ai/how-to-onboard-your- ai-assistant/

Zdenek, Sean. “Artificial Intelligence as a Discursive Practice: the Case of Embodied Software Agent Systems.” In *AI & Society* 17, no. 3 (November 2003): 340–63.

Zhao, Shangyang. “Humanoid social robots as a medium of communication.” In *New Media & Society* 8, no. 3 (June 2006): 401-419.

Appendix

A: Data Analysis Twitter "Love Notes"

	A	B	C	D	E	F
1	**Date**		**Description 1**	**Description 2**	**Description 3**	**Description 4**
2	17/11/16		smooth	impressed	:D	talked with
3	15/11/16		better	in awe	magically	
4	14/11/16		superb	well done		
5	12/11/16		feeling like a Boss	thanks	service	
6	5/11/16		best	thank you		
7	6/11/16		better			
8	3/11/16		awesome			
9	2/11/16		Love	hooked	<3	
10	31/10/16		excellent			
11	28/10/16		pure magic			
12	26/10/16		just like humans	gets better with time		
13	25/10/16		loving	time saved		
14	25/10/16		thought it was a person			
15	21/10/16		love	automatically	professional	
16	18/10/16		coolest			
17	18/10/16		Thank goodness	awesome	<3	
18	17/10/16		loving	doing stuff	saving me time	great
19	14/10/16		keeping up with my calendar	impressive		
20	14/10/16		awesome			
21	14/10/16		time saver	enjoy	awesome	
22	11/10/16		I send her a thank you	good		
23	9/10/16		helped me	impressive	almost invisible	
24	5/10/16		incredible			
25	4/10/16		thank him for			
26	4/10/16		coolest you can ever imagine			
27	30/09/16		great	indispensable		
28	23/09/16		amazing	making life much more simple	thanks	
29	22/09/16		can't live without her			
30	22/09/16		ask Amy to marry me			
31	21/09/16		beautiful	love		
32	19/09/16		scheduling			
33	15/09/16		ease of navigating time differences	time save		
34	14/09/16		impressed	makes a real difference		
35	6/9/16		amazing	changed my life	is productive even when I am not	
36	2/9/16		amazing	help	happy to give you some money	
37	2/9/16		amazing			
38	2/9/16		love	rockstar schedulers		
39	2/9/16		love			
40	31/08/16		can't wait to replace all menial tasks with r	what a time to be alive		
41	18/08/16		fantastic	helping schedule things		
42	17/08/16		time saving	well done		
43	17/08/16		thank you	inspiring		
44	17/08/16		impressed	can't live without		
45	15/08/16		loving	good work		
46	12/8/16		awesome			
47	12/8/16		been a nightmare without Amy	well done		
48	2/8/16		awesome	thanks	seamlessly	smart
49	2/8/16		love	turing test = 100		
50	2/8/16		smarter than us	she remembers things		
51	28/07/16		wow	the future is now		
52	27/07/16		Amy gets me	:)		
53	26/07/16		thanks	recommend	her	
54	25/07/16		does all my meetings	like		
55	22/07/16		awesome	my new BFF		
56	21/07/16		amazing			
57	19/07/16		I love you			
58	14/07/16		love	work my new PA is doing for		
59	13/07/16		thanking her	thanks		
60	12/7/16		passed the Turing test	fascinated		
61	12/7/16		in love			

62	8/7/16		crushing out appointment setting	she		
63	8/7/16		works well	enjoy the interaction model		
64	7/7/16		best	fantastic	brilliantly done	
65	5/7/16		fantastic			
66	30/06/16		done in 5 minutes	wow		
67	27/06/16		love	<3		
68	27/06/16		lifesaver	don't know why I wasted so much time before		
69	20/06/16		hooked	wowzers		
70	20/06/16		loving	easy to manage	huge help with calendaring	thank you
71	17/06/16		asked her to get on the phone			
72	16/06/16		talking to	he wasn't human		
73	16/06/16		love	great at scheduling play dates for moms		
74	16/06/16		love	fools folks into thinking she's a real p	best	
75	14/06/16		the future is now			
76	14/06/16		mindblowing			
77	13/06/16		excitement	loving it		
78	13/06/16		amazing	thought Amy was real		
79	12/6/16		dream	look forward to meeting her		
80	9/6/16		very cool	glad	could kill all other schedule software	
81	6/6/16		thought it was a real person	her		
82	1/6/16		thanked	believing it was human	gamechanger	
83	10/3/16		much less follow-up	getting back more time		
84	10/3/16		wow	speechless	blowing me away	love
85	10/3/16		awesome	highly recommend		
86	10/3/16		take care	cool		
87	9/3/16		words cannot describe	love	amazed	thank you
88	9/3/16		so much easier			
89	8/3/16		didn't even notice it wasn't a real person			
90	7/3/16		incredible			
91	6/3/16		incredibly natural	in love		
92	5/3/16		easy	think Amy is human	so natural	
93	3/3/16		big fan	thank you		
94	2/3/16		human traits	nobody's perfect, except maybe Amy		
95	1/3/16		dream	employee		
96	29/02/16		game changer			
97	26/02/16		love	wonders		
98	25/02/16		love	half my time is spent on scheduling	time for real coffee and work	
99	25/02/16		love			
100	24/02/16		incredible	amazeballs		
101	24/02/16		wow	impressive		
102	24/02/16		love			
103						
104		synonym of "good"				
105		gratitude				
106		humanization				
107		expression of love				
108		traits/solutions				
109		Room for improvement				