

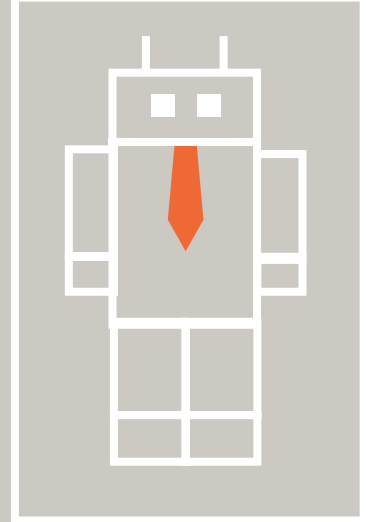
The Bot Effect: 'Friending Your Brand' Machine Intelligence

Report 2 of 4



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We thank the Oxford Internet Institute (OII), for insights and ideas that came out of our collaborative Machine Intelligence workshop, specifically: Luciano Floridi (Director of Research, Professor of Philosophy and Ethics of Information), Scott Hale (Data Scientist), Vili Lehdonvirta (DPhil Programme Director, Research Fellow), Michael Osborne (Associate Professor in Machine Learning), Mariarosaria Taddeo (Researcher, Information and Computer Ethics), John Tasioulas (Professor of Politics, Philosophy and Law, King's College London), Greg Taylor (Research Fellow, Microeconomics of Internet mediated marketplaces), Taha Yasseri (Research Fellow, Computational Social Science). We like to note that neither the OII nor any of the above named persons are responsible for the views expressed in this report.



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During the F8 developers' congress on 12 April 2016, Mark Zuckerberg, CEO of Facebook, disclosed that he was routinely using 'bots' – smart software applications – on Facebook Messenger. According to Zuckerberg Messenger is now sizeable enough to embed it in a new ecosystem. Apart from friends and family, we can now also use this platform to have conversations with artificial 'friends'. These so-called friends are services that are being offered by businesses in particular. Many people may still find it difficult to conceptualize 'brand as a friend', but the underlying idea is perfectly clear: Facebook aims to reap the fruits of the popularity of messaging by allowing bots to be implemented on the platform. The fact is that on a monthly basis more than 900 million people are active on the Messenger platform, while on a global scale almost 3 billion people are chatting every day – not just via Facebook Messenger, but also via other chat applications, such as WhatsApp, Line, WeChat and Kik.

The following definition appears workable:

'A bot (short for robot) is an algorithm acting on behalf of an individual, business or program, that can mimic human conversation'.

That it is not always easy to identify the difference between an online interaction with a bot versus a live human is illustrated by Robert Epstein, a professor of psychology, who in the US is regarded as a 'love expert'. Carrying out research how people try to find partners via the web, Epstein himself fell for the charms of such a bot. After his divorce he started to use a dating site and met Ivana. After four months of intensive mail

contact he found that he had in fact fallen in love with a bot. And Epstein is not the only one.

That it is possible to admit bots to Facebook Messenger in the first place has everything to do with the rise of Machine Intelligence. Thanks to their ability to interpret colloquial language (natural language processing) and to answer in an intelligible way, robots are capable of online interaction like any human – or

increasingly so, at any rate. This is quite helpful to organizations as it is impossible for them to have real conversations with all their customers. Robots are now taking over this task. Not only do they listen, they can also find out, record and buy things or give advice. Based on their built-in Machine Intelligence and using the many conversations, they are getting to know us better and better, which enables them to serve us according to people's needs.

This strategic action by Facebook may definitely be called remarkable. Even more striking is the fact that thirteen days earlier Microsoft had announced the very same thing. During the Build congress¹ on 31 March 2016, Microsoft CEO Satya Nadella communicated that the company's new strategy was to be based on robots and chat platforms. 'Conversation as a platform', as Nadella phrased it.

'We are on the cusp of a new frontier that pairs the power of natural human language with advanced machine intelligence.'

Satya Nadella, Build 2016

Nadella explains that artificial intelligence in the form of chatbots is 'the next big thing', just as important as the introduction of the web browser, the graphic user interface and the touchscreen. In the article in Businessweek: 'Clippy's Back: The Future of Microsoft is Chatbots'² it is explained why Microsoft believes that at the end of the day every business – from a hairdresser to an automobile manufacturer – will be into making bots. This is in line with Gartner's prediction that 'By 2020, Microsoft's strategy will be centered around Cortana, rather than Windows'. Cortana is Microsoft's intelligent personal assistant that manages various bots like a conductor.

That two of the major players in information technology have so much faith in the future of the bot is partly due to the Chinese WeChat. This messenger platform opened its doors to bots prior to this. From the WeChat IM interface, the Chinese can pay a bill on the spot, transfer money, book a restaurant table or order a taxi. Of the 700 million Chinese active on WeChat on a daily basis, 200 million have such a digital pay service. This elicited the following statement from David Marcus, VP Messaging Products of Facebook and former CEO of PayPal:

- 1 <http://www.itpro.co.uk/strategy/26278/build-2016-why-microsoft-predicts-a-world-of-talking-bots>
- 2 Bloomberg Businessweek, 'Clippy's Back: The Future of Microsoft Is Chatbots', 2016, <http://www.bloomberg.com/features/2016-microsoft-future-ai-chatbots/>

'Messaging is really, truly the next frontier... The Asian paradigm has shown there's a there there.'

'There's a there there', in other words: 'We see the benefits'. The Asian paradigm refers to WeChat's bot success. And when 200 million Chinese do not hesitate to do business via a chatterbot, one can quite well imagine that the rest of the world is following these developments with great interest.

In this report the idea that bots are going to play a major role on messenger platforms in everyday life, is central. Although it is still difficult at this stage to gain a comprehensive view of the impact, it is perfectly clear that we are talking about a fundamental shift in the way organizations and customers will conduct their business. The so-called bot effect is in line with a tradition of former shifts in information behavior. It is impossible to imagine life today without social media and apps, for example. Still it turned out that there was also a future for Twitter, Facebook and the smartphone. The transition to these new media eras only took a few years.

Two of our publications on these phenomena, viz., *Me the Media* (on the rise of social media) and *The App Effect* (on the impact of the smartphone), appeared in print on earlier occasions.



And once more we are witnessing the advent of a new era. 'Goodbye apps, hello smart agents' it says in the news reports of TechRadar.³ The true buffs tend to note that bots may well be embraced and accepted at a faster rate than apps at that time. After all, people are already active in large numbers on messaging platforms. It took the app effect a while to get going, because in the beginning practically no one owned a smartphone.

From apps to bots

Whether you call them smart agents, software robots or digital personal assistants, the break-

3 <http://www.techradar.com/news/world-of-tech/future-tech/goodbye-apps-hello-smart-agents-are-you-ready-for-the-post-app-world--1309611>

through is: we are going from apps to bots. We are going to have software assistants that handle conversations between people and organizations. For a short time now this has been known as ‘conversational commerce’. ‘Nothing new under the sun’, you may say, for obviously any form of commerce starts with a conversation. As early as 1999, the internet classic *The Cluetrain Manifesto* pointed out that markets are conversations. In *Me the Media* we also referred to ‘The Rise of the Conversation Society’. Now we are adding a new chapter. Conversations are increasingly run via smart software. So, when commercial parties join the prevailing messenger platforms, a new market place for trade and transactions will emerge. According to the analyst agency Gartner⁴ this trend places us in the post-app era:

‘By 2020, smart agents will facilitate 40% of mobile interactions, and the post-app era will begin to dominate.’

The bot effect

Conversational commerce offers opportunities and challenges in four domains. In the IT domain, work needs to be done on the *peoplefication* of the interface, and in the economic field the *bot butlers* are demanding our attention. This struggle is taking place in *micro moments* where the consumer’s intentions are being anticipated. At the end of the day the *conversations* do not only take place between organizations and consumers, but they will also extend to the shop floor. In this report we will elaborate on these four domains.

To start with, we will outline the general developments in the conversational-commercial domain in chapter 2 – for example, the ‘friend a brand’ practice as applied by KLM (Royal Dutch Airlines), who were among the first to be active in this field. The example of WeChat – the Asian paradigm – also illustrates the possibilities. The four domains mentioned above will be discussed afterwards. We round off the chapter with conclusions and reflections. The latter are no doubt necessary, because not only does ‘friending a brand’ represent a beautiful vista, it also raises questions as to how we can and want to give shape to the future with this new technology.

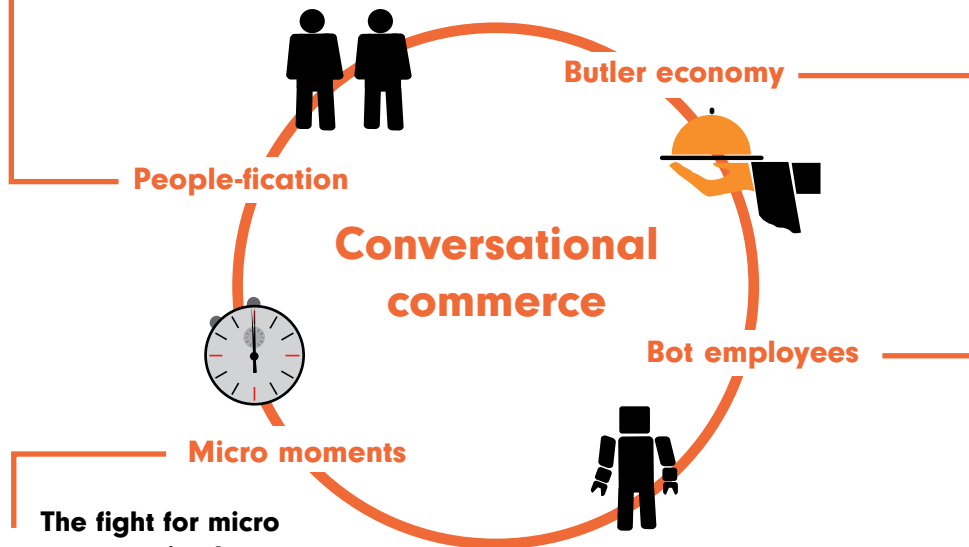
The bot effect

The people-fication of IT

Qualities that were formerly reserved for people, like having a conversation, listening to arguments or anticipating certain intentions, are now within the reach of information technology.

The rise of the 'butler economy'

The possibility to have a natural conversation with a bot and give it instructions, is creating a master-butler relationship. Having a servant that is ready to serve us at all times in a courteous and discreet manner, means a huge improvement to service in any imaginable form.



The fight for micro moments is about to start

Conversations are an everyday phenomenon, and conversational commerce emphasizes that much 'trade' is conducted in lost moments. These are the moments when people tend to take their smartphones and are ready to continue a chat. These micro moments will be crucial to the strategy of organizations.

Bot conversations in the workplace

The very same principles of conversational commerce can be applied in the workplace, and this has meanwhile come to be known as the 'conversational office'. A bot as a colleague or boss, even, is a thing of the near future.

The figures are known and impressive: 1 billion users on WhatsApp, 900 million on Messenger, 650 million on WeChat and 215 million on Line, all on a daily basis. Conversations are dominating the Internet, and doing business via bots is the up-and-coming trend. Meanwhile, this has been lumped together under the denominator 'conversational commerce', a term that marketers have been quick to pick up. Likewise, the makers of chatbots are already selling their products under the name of 'Artificial Intelligence for Conversational Commerce'.⁵ The term 'conversational commerce' was coined by Chris Messina, who in 2015 was surprised by the integration of Uber within Facebook Messenger. He describes this change in the way organizations can approach customers directly as follows:

'Conversational Commerce

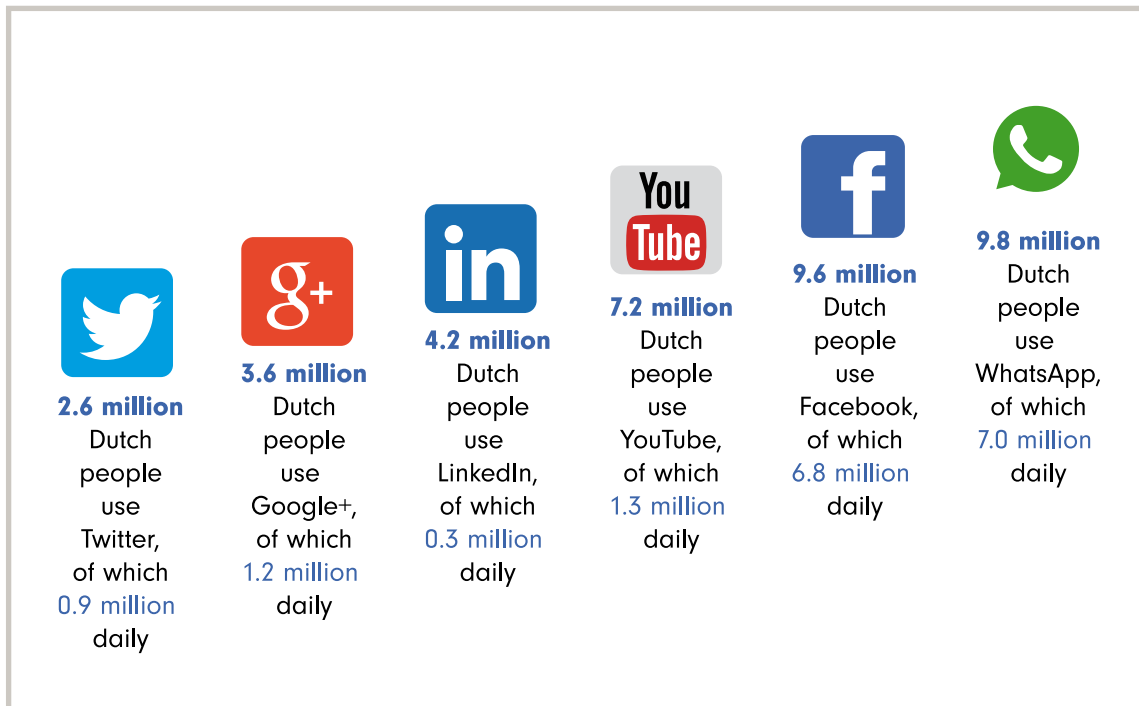
Utilizing chat, messaging, or other natural language interfaces (i.e., voice) to interact with people, brands, or services and bots that heretofore have had no real place in the bidirectional, asynchronous messaging context.'

The popularity of the chat platforms demonstrates that people find this is an agreeable way of communicating. Practically everyone is part of a group app for the family or one or more group apps for bands of friends where information is exchanged super-fast. In the workplace too WhatsApp is becoming more and more popular. Looking at the figures, we see that

chat is already more important than apps. Via WhatsApp alone, 42 billion messages are posted every day and 1.6 billion photos and 250 million videos are shared. The National Social Media Study 2016 by research agency Newcom Research & Consultancy shows that here too WhatsApp is the largest platform in terms of user numbers.⁶

5 See e.g., <http://msg.ai/> and <https://www.getrhombus.com/>

6 Conclusion: messaging is the new social media, see: <http://www.marketingfacts.nl/berichten/whatsapp-is-de-nieuwe-sociale-media>



From the National Social Media Study 2016 by research agency Newcom Research & Consultancy it appears that of the 17 million Dutch people, there are 9.8 million active daily on WhatsApp.

This way, the messaging platform is becoming the 'new connective tissue' of the telephone. Via this platform, or this interface layer, content is presented to the end user in easily digestible chunks. Why do things the hard way, because everyone is able to chat. But however intuitive an app may be, a conversation with an app will be nowhere near as natural as an ordinary conversation with another person.

2.1 The end of the graphic user interface

In the article 'Forget Apps, Now the Bots Take Over', Beerud Sheth, CEO of TeamChat, writes that the limit of the 'mobile OS + app' paradigm is in sight. What we are witnessing is 'app fatigue'. It is getting more and more difficult to find a good app, to install and manage it and to switch between the various apps. Practice has shown that the majority of mobile users only need a limited number of apps every day. Currently we have to use apps that all have different GUIs (Graphical User Interfaces). Each app has its

own rules and standards and reacts differently to our fingertips. There is just one app that has a universal interface, a 'Zero UI', and that is the messaging app. Young and old, they can all handle it.

Sheth makes out a case for a new platform where organizations can offer all kinds of services. This may be Siri, Google Now or another messaging service, or something completely different. By converting messaging into a new development platform, you create an alternative



Messaging as a platform incorporating bots. Apps are no longer needed – bots are the new apps.

for the World Wide Web and the different app stores. In this view, Sheth is not alone. Hugh Durkin of Facebook, for one, holds the same opinion. In his article 'The End of App Stores As We Know Them' he likewise elaborates upon the absence of good apps in app stores. There are too many useless, totally superfluous apps that make finding relevant apps problematic:

'These platforms are a new center of gravity for the current phase of mobile internet.'

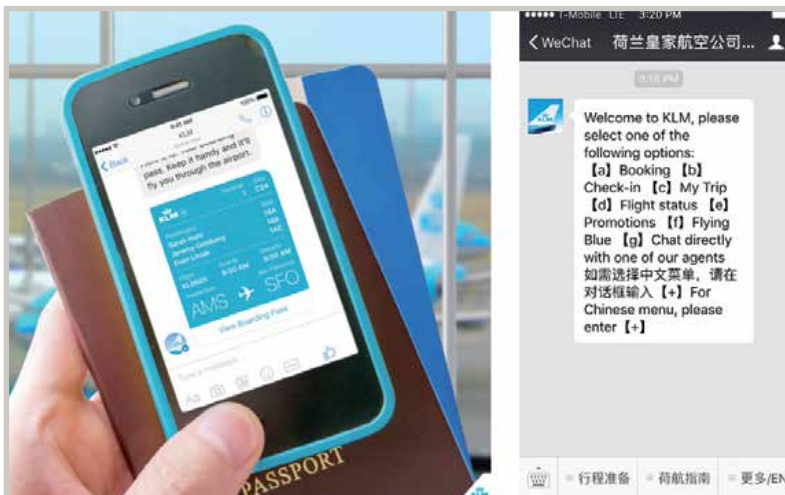
Sheth and Durkin both work for 'chat companies', so it is only natural that they are 'pro-chat'. The same goes for Satya Nadella of Microsoft. After all, Microsoft is less successful in the app market and therefore less 'pro-app minded', and is now turning its mind to the bot market. At the same time we find that all major players (Amazon, Microsoft, Google, IBM, Facebook, Apple, WeChat) are rolling out their bot strategy.

2.2 Friending your brand

Bots and the chat platforms, like Facebook Messenger and WhatsApp, constitute a strong coalition. This year Facebook and Google will be rolling out their new messenger applications, which with their own platforms and accompanying bot stores will support these digital assistants. The popular saying 'There's an app for that' will be outdone by 'There's a bot for that'. The same way that you have conversations with your friends, you will now be able to ask questions to bots and start conversations with them. You add the postman, insurance agent, doctor, dietician or IT specialist as friends to Facebook Messenger or WhatsApp and you can start a conversation at any time you wish.

KLM, for example, has had a virtual assistant for some time now that you can link to your Facebook Messenger or WeChat. Quite useful, because not just the tickets but also any changes in the departure time of your flight are passed on to you automatically.

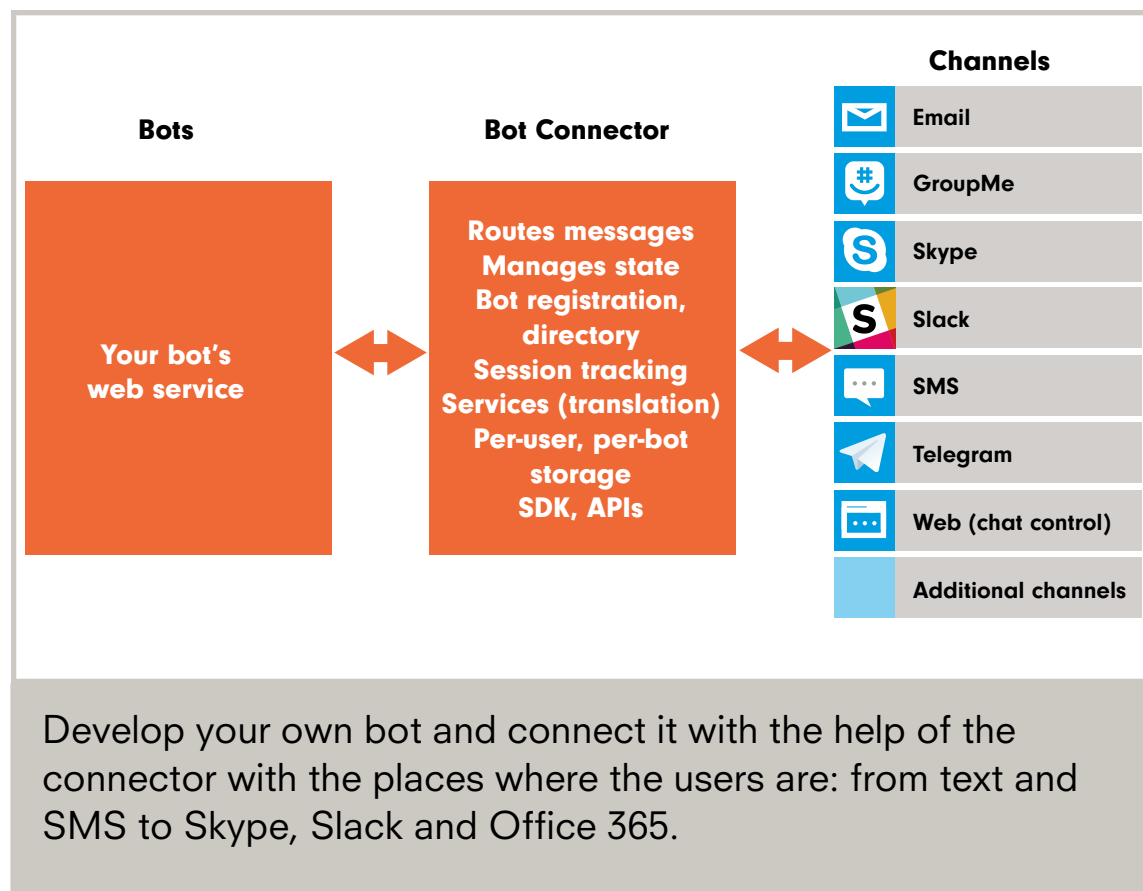
Normally speaking you use a special KLM or airport app for this. In this case you do not have to leave the chat window, you can even change seats. You ask the question in your own words and the bot will arrange matters for you. In between chatting with your family you can simply arrange your flight and keep an eye on it.



KLM customers can alter their ticket or change their seat via WeChat.

Microsoft Bot Framework

'Your bots – Wherever your users are talking'



This example adequately reflects the potential of bot conversations with organizations. A service with a smile and a 'brand as a friend': it is every marketer's dream. Basically, it offers a wealth of new opportunities: the postman bot to inform you that he is in the vicinity of your house with a package, or the dietician who pops up if you do not exercise enough. With the help of location details, social media

updates, lists of friends, restaurants that we like, next week's agenda and so on, the smart agent creates a perfect digital image of ourselves in order to support us wherever it can. To realize these kinds of things, Microsoft released its Bot Framework. In the context of making and managing your own bots for the different chat platforms, the Bot Connector plays a major role.

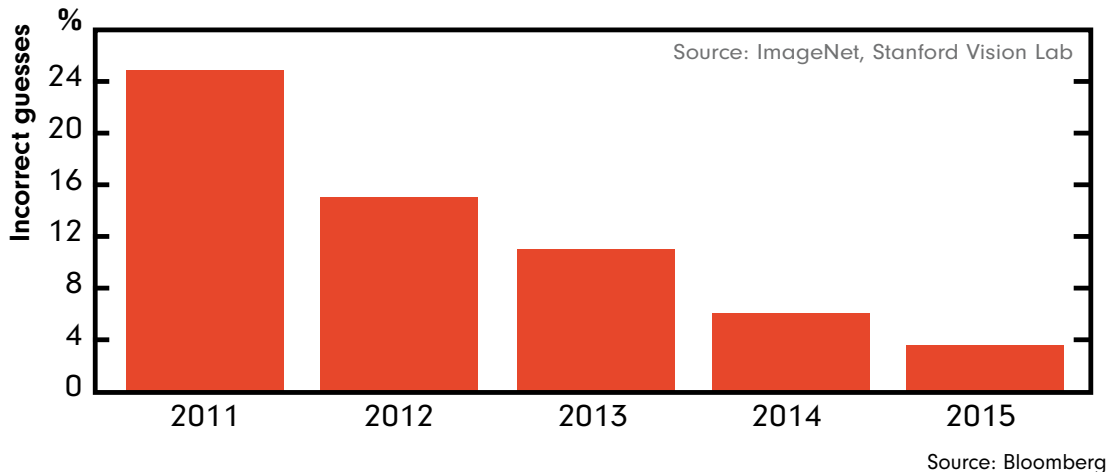
2.3 More intelligent conversations thanks to Machine Intelligence

Fantasies concerning digital assistants have been around for decades. Likewise, the term 'artificial intelligence' was first used 60 years ago. Nothing new under the sun, you might conclude. However, the developments in the fields of hardware (neuromorphic chips) and software (machine learning), as well as the availability of unprecedented

volumes of data (Big Data) are bringing about an enormous acceleration of artificial intelligence. We already wrote about this breakthrough of Machine Intelligence in our previous report.⁷ The conclusion is that currently computers are far more able to understand what people are saying or writing (natural language processing) and to interact via text

Computers Stop Squinting and Open their Eyes

Error rates on a popular image recognition challenge have fallen dramatically since the advent of deep learning systems in the 2012 competition.



Machines can increasingly see better. In just a few years the fault margin in image recognition has fallen from 24 per cent to 4 per cent.

7 See our previous report on Machine Intelligence: *Machine Intelligence: Executive Introduction*.

or speech (natural language generation). During the last four years, for example, spectacular progress has been made in terms of image recognition by computers (computer vision): machines are now beginning to open their eyes, as it were.

Jeff Dean, a senior fellow with Google, also regards the computer's ability to see as a formidable breakthrough:

'We're at this point in actual evolution where, previously, animals didn't have eyes, and now they have eyes. That's going to change a lot of stuff. Computers used to not be able to see very well, and now they're starting to open their eyes.'

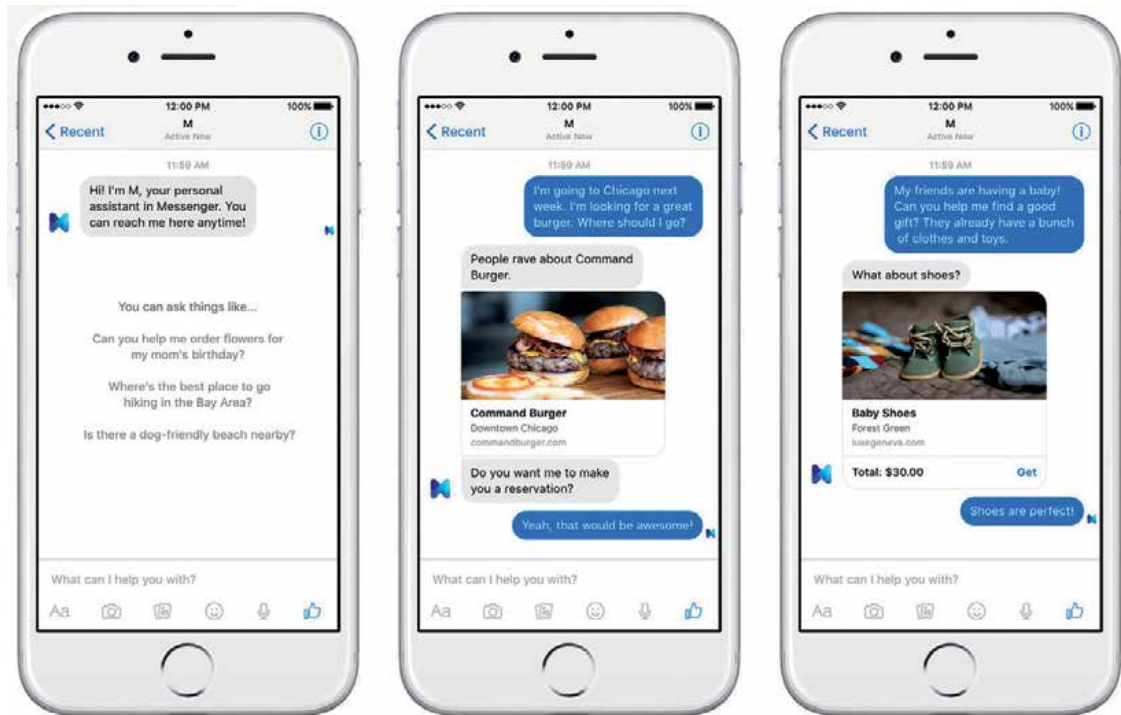


Yann LeCun.

An impressive example of what Facebook can do in this field can be seen in a video by Yann LeCun, artificial intelligence manager with Facebook.⁸ We see him talking to a smartphone asking questions about the photos on the device, about who and what is in the pictures, what the people or animals are doing and at what location the action is taking place – all these questions are answered by the algorithm with no problem at all, in natural human language. When Facebook knows that your dog is a labrador or a golden retriever even though you never mentioned this, or knows that that particular photo was taken in the bathroom or in the garage and recognizes people although you never tagged them, you are getting some idea of how far the knowledge of Facebook about our lives extends (read, for example, the article 'How Facebook Knows You Better Than Your Friends Do'⁹).

8 https://www.youtube.com/watch?v=U_Wgc1JOsBk

9 <http://www.wired.com/2015/01/facebook-personality-test/>



In August 2015 Facebook announced its own virtual assistant under the name of M. This help functions via the Messenger messaging service and is a combination of artificial and human intelligence. Basically, man and machine are closely co-operating in order to learn from one another and strengthen each other on all fronts. A group of 'M trainers' help the underlying neural network answer questions from users. If, for example, you want to eat out, M will suggest a number of restaurants in your vicinity and make a reservation if you wish. But buying things, delivering a birthday present to your partner, arranging a flight and making appointments are likewise

among the possibilities. Anything that can be handled automatically, is arranged by the underlying Machine Intelligence. Wherever necessary, humans still give a helping hand. But at the end of the day, so it is expected, the self-learning algorithm will get better and better, thanks to the answers supplied by humans.

M is still in its early stages and can only be used by a select group of end users in the USA. If it turns out to be successful, the product will be rolled out on a global scale. But in the long term M is also supposed to bring in money. In an interview with technology magazine *Wired*, David Marcus, who is responsible

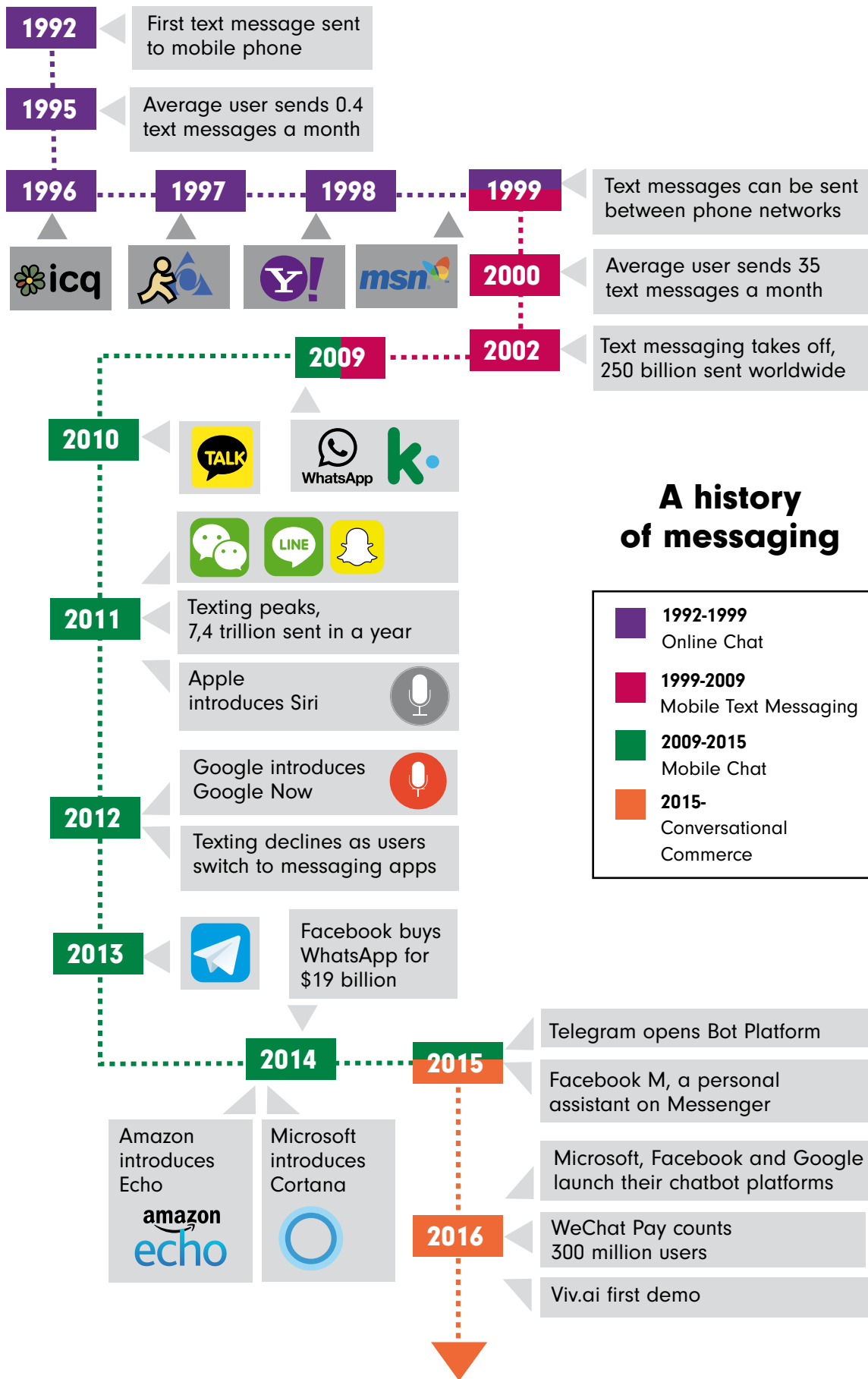
for the Facebook Messenger platform, says that he can visualize a future where thousands of people co-operate closely with artificial intelligence to find suitable answers to all possible sorts of questions from end users. With over 900 million users this should constitute a major source of revenue.

To help developers, Facebook is launching two ways to build bots. Simple bots can be developed with the Send/Receive API. Complex bots can be built with the Bot Engine, which also runs Facebook M. The Bot Engine, based on the Wit.ai technology (the company taken over by Facebook last year), is capable of self-learning by analyzing scripts of conversations. What comes to mind here is a cinema bot, for example, which has a natural language conversation with a user and processes his order of two tickets, while the user is

unlikely to notice that he is not communicating with a human but with a machine. With these recent developments in mind, it is not surprising that media firm Bloomberg labeled 2015 the year of the definitive breakthrough of artificial intelligence.

It remains open to discussion, incidentally, how intelligent a bot should be to function properly. This point can be illustrated by the example of 19-year old Joshua Bowder, who – with no profound knowledge of Machine Intelligence or programming – built his own bot called DoNotPay, which challenges traffic fines, among other things. In the event of an offense, you no longer need to call in the help of an expensive attorney. Instead an algorithm tries to settle the matter for you and in as much as 40 per cent of all cases this is successful. This bot saved traffic offenders in the UK more than € 2.7 million.





2.4 The Asian paradigm

To gain a good idea of the future of messaging, it is interesting to look at what is going on in Asia. WeChat in particular is fascinating, because without their pioneering work players like Microsoft and Facebook would not have been able to announce their plans with such bravura.

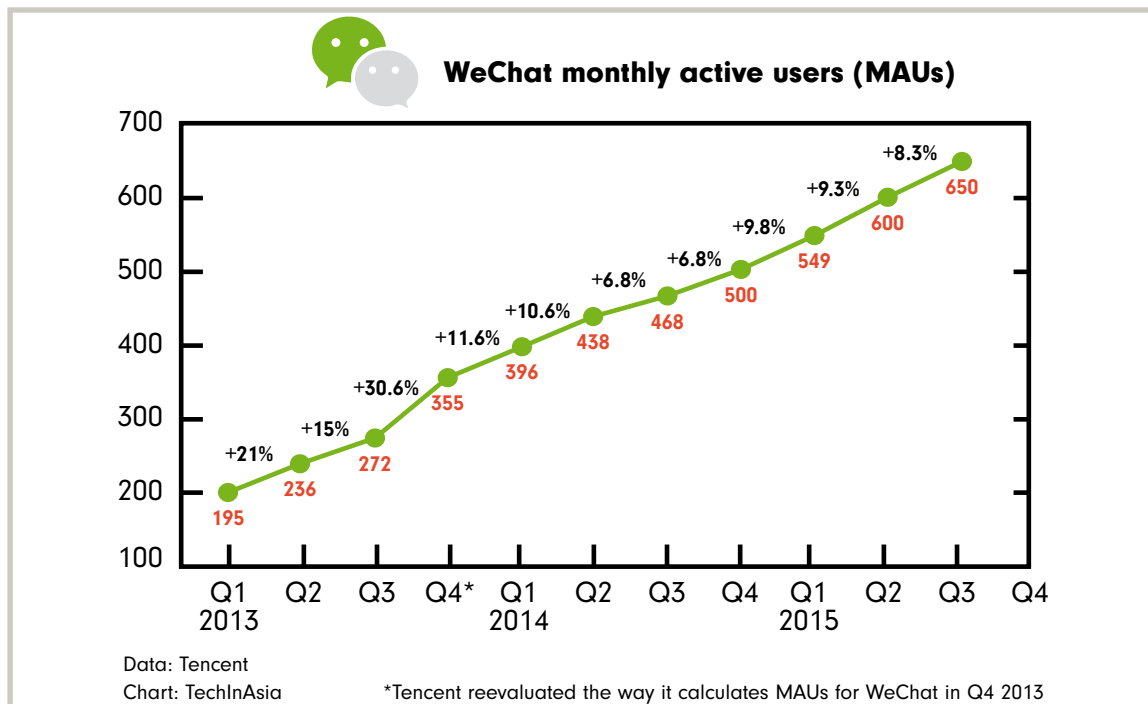
Still know them?

CompuServe, ICQ and MSN? The history of messaging shows that we have been exchanging text messages ever since 1992. At the time, this was done via the PC. Then SMS for the mobile phone was

introduced and still later the app for the smartphone – all of them ways to maintain contact and enable inter-human communication.

Picking up the thread in 2013 and zooming in on WeChat, we see impressive growth rates. In 2015 WeChat grew by just under 10 per cent each quarter.

Meanwhile, WeChat boasts 10 million services on their platform. Not humans of flesh and blood, but companies acting as friends to serve you. Your whole life can be managed from this familiar text environment. 'Chat is the





A visit to a doctor can be planned in China via WeChat. From left to right: first select the bot you need – in this case for making an appointment with the doctor. Then select the hospital, the department and the doctor, and finally fix the appointment in the diary. Obviously this functionality is dependent on the processes and business rules, which differ per country.

do-everything portal for mobile life’, as Connie Chan – partner of venture capital investor Andreessen Horowitz (a16z) – puts it. And even more futuristic: messenger applications are the ‘operating systems of our lives’. More accounts are being created in China on the WeChat platform on a daily basis than new online websites. What’s more, if you want to start a business in China, the first thing to do is not opening a website, but an official WeChat account. The number of officially registered users is more than a billion.¹⁰

WeChat enables its users to transfer money, for example, to study English, order a taxi, book a flight, make a reservation in a restaurant, watch television, play games, consult a doctor,¹¹ extend their passport or check the status of an online order. This functionality, and much more to boot, is unlocked in one and the same app. On New Year’s Eve of 2016, 8.08 billion ‘red envelopes’ (a bot to transfer money virtually) were sent via WeChat, whereas PayPal processed ‘a mere’ 4.9 billion transactions in the entire year 2015.

10 ‘When One App Rules Them All: The Case of WeChat and Mobile in China’, <http://a16z.com/2015/08/06/wechat-china-mobile-first/>

11 ‘WeChat Is Being Tried To Make Hospitals More Efficient In China’, <http://www.forbes.com/sites/jlim/2014/06/16/wechat-is-being-trialed-to-make-hospitals-more-efficient-in-china/#1fd262af48f5>

Xiaoice (Chinese) – Little Bing (English)

Xiaoice has the distinctive features of a talkative teenager. She infers the emotional condition of the users from the text messages and in addition to lending her ear also gives advice. So it is not surprising that the most closely guarded secrets are confided to her. According to Yongdong Wang, the Microsoft employee who developed Xiaoice, the chatbot is particularly popular around midnight. Some 23 messages on average are exchanged between chatbot and a person during one conversation. **‘Our vision is we want her to be a friend, not just a professional assistant. A good friend where a user can develop an emotional connection and the trust and the confidence. And someone that the user feels free to talk to.’**

Another experience from Asia teaches us that people like to strike up everyday conversations with a bot. Via WeChat and Weibo millions of Chinese talk with a bot called Xiaoice. This chatbot is based on the artificial intelligence of Microsoft’s Cortana and is also known as Little Bing.

‘At the peak of her popularity, she [the bot] was telling 35.4 jokes per second on Weibo. The average person who adds Xiaoice talks to her more than 60 times per month.’

Stefan Weitz, Senior Director, Bing

WeChat distinguishes between real transactional services like the KLM bot mentioned above and the appointments bot for the doctor, and more general information services. You can follow the news of *The Wall Street Journal*, for example, or receive the latest news about the Liverpool soccer team. You do not have to add this general information service as a friend, but it can be activated as a separate channel.

We may well experience the growth of Messenger stores and cafes. The Asian chat application Line is the trendsetter in this respect. Their main merchandise is the life-sized versions of the icons that you can add to your messages. In December 2014 Line opened its first store outside Asia (in New York). At the time 13 billion messages were sent daily via the platform, in 70 different countries.¹²



Will there be WhatsApp stores soon? Line, the Japanese WhatsApp, has already started. First in their own country, but Line has also opened a store in New York.

2.5 Conclusions and reflections

The players are preparing themselves to transform the platforms of friends, where people are exchanging messages, into trade platforms. Organizations, professionals and

brands can intervene in the conversations with meaningful services. The temptation to add those services as friends – ‘friending a brand’ – will grow as they are

12 <http://www.prnewswire.com/news-releases/line-opens-its-first-ever-line-friends-pop-up-store-in-north-america-300007810.html>

becoming more truly useful to the user. This was aptly formulated by Satya Nadella, CEO of Microsoft, in his speech of March this year, when he announced the new strategy of his company: the move from apps to bots can only be realized if bots offer a better alternative to the apps with which people are so familiar nowadays. That focus on the user will be the key when it comes to really creating a watershed in information behavior (and, following naturally, buying behavior).

When we keep in mind that economic feasibility, technical practicability and social desirability will together determine the further course, one may safely assume that the first one will present no problems. From an economic point of view, the platform that is daily visited by billions of people is very attractive. Technically speaking, adding a bot is a piece of cake. There are other technical aspects, however, particularly the extent to which the human-bot interaction will turn out to be successful, that still needs further looking into. The so-called *people-fication* (see the next chapter) is a new discipline where there is still a lot to be discovered and developed. That the social desirability is no problem is demonstrated by the Asian paradigm. But we regard what is now going on in Asia as the very beginning. There remain many questions

as to how it will work out in the future.

For example, will there be unwanted bot intimacies lurking? Bots are lodging in users' conversations. The danger is not inconceivable that users will be bothered – whether it is relevant or not – by these bots because they are so ready to help. The difference between 'bothering' and 'being helpful' is truly wafer-thin. Organizations about to start up chatbots should be permanently aware on which side of the divide they find themselves. Indeed, you would hate to be the new Clippy, who caused a lot of vexation on the part of the end user because he was frequently wrong.¹³ And can we still speak of privacy in a world where bots help us in lots of ways? Because a bot reads the messages that are exchanged in a conversation. Did the other persons in the group app actually give their permission? Is it quite clear what 'permission' there is with respect to the data (the location, for example, or sharing the diary)? And these are but a few questions that come to mind as we are becoming aware of the possible consequences of conversational commerce. More potential consequences follow at the end of the next few chapters.

IT systems were not designed with a view to having a natural human conversation. But that is precisely what bots rely on. The attribution of this human quality to algorithms is what we call 'people-fication'. This term was coined by Jim Hunter, Chief Scientist of Greenwave Systems, which operates in the market of the Internet of Things. This humanization of technology is central in conversational commerce. Bots have conversations via text or speech, as if they are humans. When the virtual assistant is given a face, visual human qualities, so to speak, we speak of 'embodiment'. This raises new questions. What is the role of this embodiment in conversation? Does it add anything to the chat conversation? And what does the avatar look like? Man or woman, young or old, or should it be a little figure or a caricature?¹⁴

The fact that there are no easy answers to these questions, illustrates where we find ourselves from a social and technological point of view: at the very beginning. Mindful of the critical user, bots that have not properly mastered the art of conversation will end up in the bot junkyard – beside

all the apps that did not come up to our expectations.

Natural language processing and natural language generation are important Machine Intelligence technologies that bots rely on. When chatbots are regarded as living characters, which you can

Anthropomorphism

In science and philosophy this term is used when human characteristics and value judgments are attributed to non-human beings (animals, plants, gods) or things. Therefore, it is another word for people-fication. As soon as a (living) person is raised as representation, one speaks of 'personification' or 'embodiment'.

14 See, for example, 'Developing a Virtual Coach for Chronic Patients', Persuasive Technology Conference proceedings (2016).

The Turing test

Advancing technology makes it more and more difficult to distinguish between human and machine. In 2014, for example, the first major breakthrough was reported with respect to the famous Turing test. This test, formulated in 1950 by Alan Turing, examines whether a human test subject who cannot see who (or what) he is interacting with, can establish whether he is communicating with a human or a computer. If a significant number of the panel members are convinced they are interacting with a human (the standard is 30 per cent), the test is successful. And indeed, in 2014 one in three of the members of the panel was convinced he had been having a five-minute conversation with a human instead of a computer. Although there is a great deal of controversy in this case as to the circumstances of the test, the main lesson is that even relatively little artificial intelligence will do to give someone the illusion of a natural inter-human conversation. Illusion and intelligence are partly interchangeable and besides: if the bot performs its task successfully, what is the difference?

communicate with in a human and natural manner, this makes heavy demands on designers. Positioning and coloring pixels is no longer

relevant in the case of conversational interfaces. What matters is designing the right character for a bot and modeling the conversation.

3.1 The robot's personality

Bots as computer imitations of humans that can listen, speak and analyze exist in many forms and levels. The most ambitious are the intelligent and personal bots, as presented in the movie *Her*. In terms of knowledge and interaction the software robots presented in this

movie cannot be distinguished from humans. Then there are also super intelligent bots from the cognitive systems kitchen of IBM. They are not quite able to display such empathy, but are definitely a match for doctors when it comes to medical knowledge.

The bots may surprise us within the contexts of two fields. With the knowledge they have of medical science, for example, or how the law works, they are even better at making a diagnosis or giving legal advice than humans. And when they get to know the user better through the conversations they are having, and in addition are fed personal data from other sources, the computer is better able to carry on a 'real' conversation and eventually

anticipate our intentions. The latter is the 'warm' quality of the bot; the professional knowledge is what we call the 'cold' side of the bot.

The classic among the bots is Eliza, the very first chatbot, which was created in the mid-sixties in MIT's Artificial Intelligence Lab. Machine Intelligence does not enter into the matter here, it is a script of questions and answers. But the illusion that is created is that the bot gets to know the user's personal environment based on the conversation that is being held. A variety of scripts for question-and-answer interactions were developed, and the best known is probably the virtual psychotherapist DOCTOR.

Many organizations work with modern versions of Eliza. They are personal assistants that can be found on the website of the company to assist visitors. They function based on a script. Without forming an opinion, what strikes us in terms of the design of these virtual personalities, is that most of them are women and that they are depicted with broad smiles. But what kind of design principles should be applied? Not much is known about the impact of 'embodiment'. Black or white, man or woman? Or a character like the Michelin Man? How does it impact the conversation?

Cold	Warm
IQ	EQ
The objective world	Perception of the environment
Generic	In the user's context
External data	User's data
Searching for answers	Searching for intentions

```

=====
EEEEEEE L      IIIIII  ZZZZZZ      AAA
E        L        I      Z      A  A
E       L        I      Z      A  A
GGGGG   L        I      Z      A  A
E        L        I      Z      A  A
EEEEEEE LLLLLLL IIIIII  ZZZZZZ      A  A
=====
ELIZA > (PLEASE TYPE IN ALL CAPS) WHAT'S YOUR NAME DEAR ?
ANIT
ELIZA > HI, I'M ELIZA. WHAT DO YOU WANT TO TALK ABOUT ?
ANIT > CAN I TALK ABOUT MY PROBLEM ?
ELIZA > SURF... ?
ANIT > DUE TO ON GOING EXAMS IN COLLEGE, I HAVE A LOT OF STRESS.
ELIZA > PLEASE RELAX A LITTLE. SLEEP WELL.
ANIT > THANKS FOR YOUR ADVICE.
ELIZA > NO MENTION.
ANIT > BYE
ELIZA > BYE AND KEEP IN TOUCH...
=====

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A selection of digital assistants. From left to right: Ida of the Norwegian State's Ministry of Transport and Communication, Jenny of Virgin Media, the Michelin Man, Yoko of Toshiba France, Kate of AT&T and Ada of IKEA. All on the web, not yet on a messenger platform.

IPsoft claims major progress in this field with its call center bot which is used by Shell, among others. This Amelia can independently deal with emails and phone calls. The artificial intelligence supporting this technology is able to find connections with earlier conversations, so that questions, purchases and complaints are forwarded directly to the right person. This bot's character traits are compelling: Amelia is fluent at natural conversation, is emotionally engaged, understands the context and is above all scalable. Amelia lets us have a look into the future. Where the bots of Virgin, AT&T and the other companies mentioned are purely based on scripts, Amelia has the ability to get better at what she is doing thanks to machine learning.



Amelia, the chatbot of IPsoft, is currently the cream of the crop.

3.2 'Emotional' marketing bots

In early 2016 Disney launched an artificial-intelligence controlled chatbot for the Facebook Messenger platform. As part of the promotion of the new *Muppet Show*, viewers can now chat with Miss Piggy and ask her all the ins and outs. As in the TV program, the charming pig also has a way with online words. When she is asked how Kermit is doing, she reacts rather tartly: 'I wish everyone would stop asking me about Kermit ... I've moved on.'

Disney created this marketing bot in conjunction with the Israeli company Imperson. According to Imperson's CTO, Eyal Pfeifel, this form of marketing conveys the feeling to users that they are having a real conversation with an imaginary character. On the company site you can find three more examples: a conversation with an M&M, with the comic hero Iron Man and with actress Jennifer Lawrence. Pfeifel claims it is a new form of user experience, a completely new way of connecting people to a company or brand:

'It creates a new kind of engagement, which is around messaging person-to-person like most messaging platforms but also person-to-business or person-to-brand or person-to-publisher. It expands the platform beyond just personal communication.'

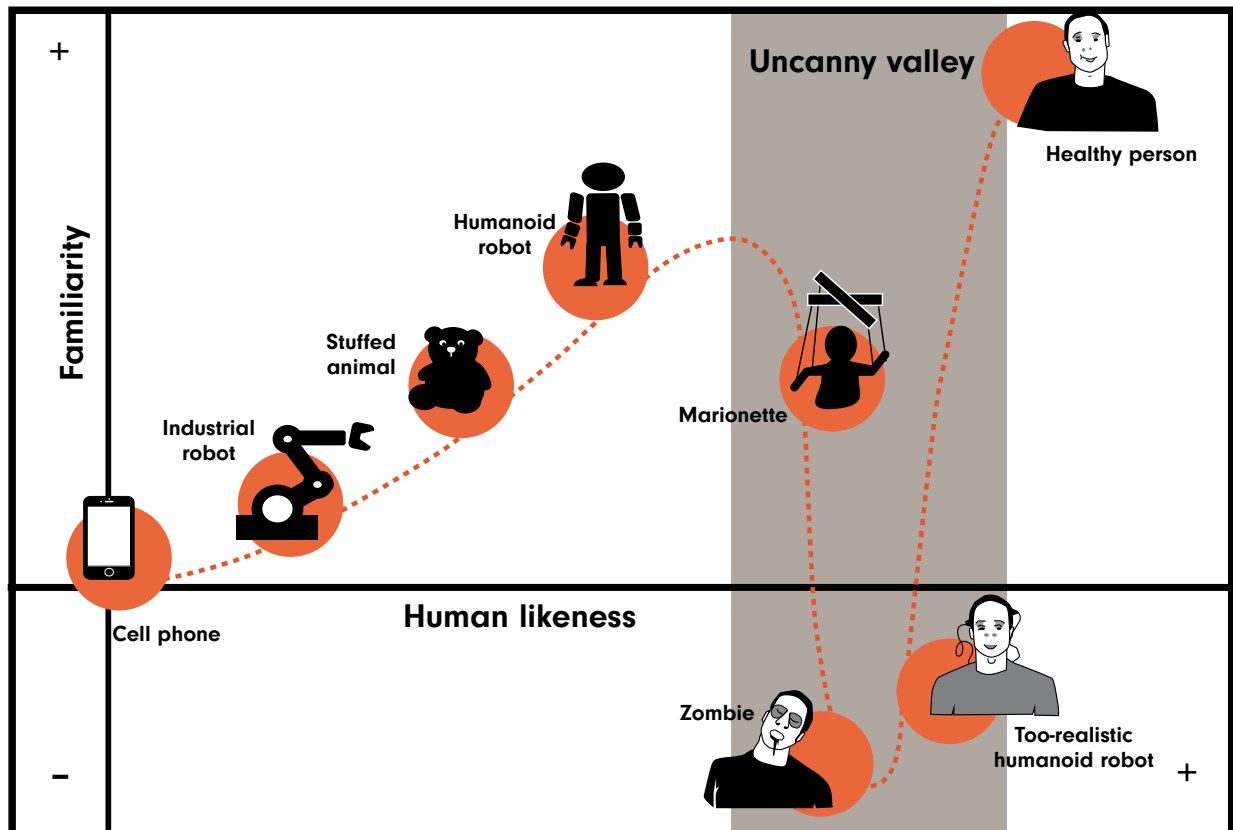
For its new virtual assistant Cortana, Microsoft even hired a full personality team to shape the character of this artificial intelligence. The final responsibility of the team lies with Jonathan Foster, a former TV and movie scriptwriter. For his assistance, the team includes a



New marketing companies throw themselves on chatbots. Imperson for instance delivers 'personas' and the company points out the importance of 'capturing your own voice' in that of the bot, such as with M&M. The danger otherwise is that the two will not remain close to each other.

novelist, a poet, a dramatist, some scriptwriters and a group of journalists. These people meet every day to think about new funny reactions to add to the ever-growing repertoire of Cortana. The team is

working hard to avoid the so-called 'uncanny valley' – the point where aversion towards a humanoid robot begins to prevail the more it resembles a human being.



By equipping an avatar with all kinds of character traits – Cortana, for example, hates water and is totally nuts about anything to do with *Star Trek* – the team aims to build up a relationship based on trust. People do not merely develop a friendship with the chatbot – for 25 per cent of them the relationship is a lot deeper. At one time or another they all said ‘I love you’ to Cortana. Just recall professor Robert Epstein from our introduction, who once fell for the charms of a chatbot. There are even plenty of people who are willing to spend money to have a chatbot for a friend. It is the business model

behind Invisible Girlfriend. When you are fed up with being pestered by family and friends about the status of your relationship, you can subscribe to a virtual girlfriend who swamps you with all kinds of texts and voicemail messages: ‘Invisible Girlfriend gives you real-world and social proof that you’re in a relationship – even if you’re not – so you can get back to living life on your own terms.’

Microsoft is not the only one in its approach of chatbots. The makers of Howdy, for example – a digital colleague within the office environ-



How scarily real a robot can be, was shown in 2015 when an android lookalike of science-fiction writer Philip K. Dick told people during an interview that there was no need to fear a Terminator-like scenario: '...don't worry, even if I evolve into Terminator I will still be nice to you, I will keep you warm and safe in my people zoo where I can watch you for old time's sake.'



The Hen-na Hotel in Japan (literally: strange hotel), meanwhile, offers you the choice of being helped by a dinosaur or a more human avatar. The ambition is to have 90 per cent of all the work in the hotel done by robots and create 1000 hotels of this type.¹⁵

ment of Slack – hired the comedian Neal Pollack to give the bot a personality. This way work suddenly becomes fun: 'Slack acts like your wise-cracking robot sidekick, instead of the boring enterprise chat tool it would otherwise be.' Meanwhile Slack also made an 80 million dollar fund available to be used by developers to create their own bots, which can of course be run on Slack's platform. And X.ai – a digital secretary to manage all your appointments – hired Harvard

graduate Anna Kelsey on account of her studies of folklore and mythology and her affinity with the theater. Kelsey seems to be doing a good job, because even though people are aware they are communicating with a bot, they often say 'Thank you' at the end of the conversation.

15 'High-tech Japanese hotel to employ human-like robot staff' (2015), <http://www.engadget.com/2015/02/08/high-tech-robot-hotel-japan/>

3.3 Conclusions and reflections

How long will it be before you hire a personality team to teach your bot the right communication skills? It sounds like a complicated exercise, but on the other hand building and maintaining an app is no joke either. Questions like whether a button should be on the left or the right, the screen should be blue or red and what the app's menu structure should be like, will all be things of the past when conversational commerce makes a breakthrough.

People-fication ensures that we deal differently with the information we receive, even though the user is aware that there is a piece of software at the other end of the line. What this implies for the user's brand perception, to mention just one – and rather significant – aspect, we do not know yet. Will people's confidence in the service fall or increase when bot conversations create the illusion that they are dealing with a human? And how socially-minded will we be next as human beings? Will bot infatuation be the new trend after the app addiction? Little Bing showed that people can maintain a relationship with a machine. In her book *Alone together*, Sherry Turkle alerts us to this kind of danger from new technology, which implies a paradox: on the one hand technology adds

something, but on the other hand it takes something away. In her book Turkle articulates serious concerns about the way people maintain social contacts. We tend to increasingly fall back on social media to communicate with each other, but is not a face-to-face conversation immensely more personal? Will chatbots aggravate this danger? Assuming that chatbots are first and foremost supposed to be service-oriented, and nice and patient, and permanently available, you may well wonder how that is going to affect face-to-face conversation in the distant future. When bot friendliness and bot attentiveness become the standard, will we continue to accept people's unpleasantness and lack of interest?

The term 'butler economy' or 'concierge economy'¹⁶ dates back to the app age, but is even more suited to the characteristics of conversational commerce. The bot as a butler is a rather obvious comparison. We have power over the butler and the butler bot executes things. The bot is the perfect slave and will obey at all times, or – like a true butler should – anticipate what we will need later.

Digital assistants in all shapes and sizes

Quite a good overview of what is available nowadays when it comes to bots is offered by the longlist of Chris Messina, who hit upon the idea of the Twitter hashtag and is now employed by Uber. It is a list of over 200 digital assistants, from simple SMS advice services like AskAlexis to Angee: the bot that monitors the safety in your home and knows when it is you who is walking towards the house. Meanwhile there exist plenty of examples of all kinds of digital personal assistants that make our (working) lives easier. Pana books your holidays, Vida keeps an eye on your health, X.ai manages all your appointments, Knotify plans your wedding, Luka books a table in a restaurant, Scratch provides shopping advice, Riley finds you a new house, Operator is your personal shopping assistant and Magic is your digital butler that complies with all your wishes: all by sending simple text messages. Assistants come in all shapes and sizes. Some have self-learning skills – they are classified as 'intelligent' – whereas others are still old-fashioned and based on scripts alone: the dumb version. They also differ in the extent to which they want or need to know us, or have a good understanding of the world around us, like the weather, law of precedent, diseases or the news.

The butler knows what is going on in his master's life. With the growing knowledge of our lives that these bots are acquiring, they are increasingly able to operate according to our intentions. In the article 'We'll All Have a Personal Army of Specialized Smart Agents Soon', designer Ann Wuyts outlines such a scenario. In the near future the personal cloud will change into an army of 'smart agents', each of which fulfills a specific task. The network of all these smart agents functions as a kind of electronic brain by making connections and associations autonomously. As this network makes smart use of all sorts of social data like tweets, Facebook status updates and Instagram photos, but also the geo-location, the air humidity and even the heart rate and body temperature, a digital context of the individual emerges.

Gartner refers in this context to 'cognizant computing': a personal cloud that is highly private because of the knowledge stored. An example of a company that seeks to realize this personal cloud is Viv.ai. This company regards its bot as a 'global brain'. The bot is to provide everything and everyone with an intelligent interface and Viv wants to dominate in the telephone, the car and the fridge alike. Viv¹⁷ is able to string various services

together, which it does fully autonomously: it programs itself.

'Tell Viv what you want and it will orchestrate this massive network of services that will take care of it.'

Currently this search is the last interface between intention and transaction. But in the butler economy this is no longer necessary. According to Alex Iskold, tech-entrepreneur and a successful investor in start-ups, chatbots will especially change the search behavior for new products and services.

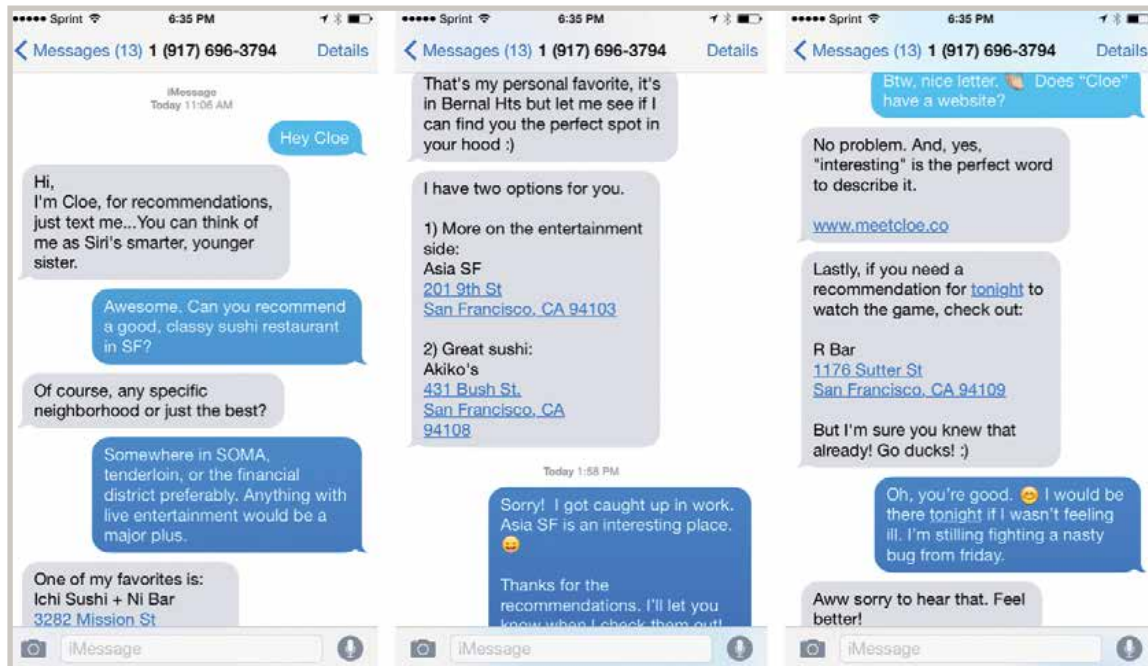
'I've seen the new face of search and it ain't Google.'¹⁸

The screenshots on the next page are of digi-assistant Cloe, Siri's smart sister.¹⁹ We see how the -consumer is conducted to new purchases via question and answer, without excursions to Google.

17 <http://www.theguardian.com/technology/2016/jan/31/viv-artificial-intelligence-wants-to-run-your-life-siri-personal-assistants>

18 alexiskold.net/2015/02/22/ive-seen-the-new-face-of-search-and-it-aint-google/

19 <https://www.producthunt.com/tech/cloe>



4.1 Always bet on text

When it comes to humanization of computer conversations, the choice is between speech and text. Text certainly has its advantages. In his blog 'Always bet on text', computer geek Graydon Hoare writes that the extent and scale that people use text is unparalleled. Look at the

libraries full of books, he says, the mass of information stored on the Internet, all the postings on blogs and the tweets. Graydon lists the following seven text characteristics that provide a good understanding of the advantages of text over other forms of communication.

'It works well in 1:1, 1:N, and M:N modes.

It can be indexed and searched efficiently, even by hand.

It can be translated. It can be produced and consumed at variable speeds.

It is asynchronous.

It can be compared, diffed, clustered, corrected, summarized and filtered algorithmically.

It permits multiparty editing.

It permits branching conversations, lurking, annotation, quoting, reviewing, summarizing, structured responses, exegesis, even fan fic.'

Jonathan Libov, working for venture capital investor Union Square Ventures, agrees. In his article 'Futures of text' he adds a number of text qualities to the list:

'I believe comfort, not convenience, is the most important thing in software, and text is an incredibly comfortable medium. Text-based interaction is fast, fun, funny, flexible, intimate, descriptive and even consistent in ways that voice and user interface often are not.'

Jonathan Libov, Union Square Ventures

It might be a good idea, incidentally, to take a look at Libov's postings.²⁰ He supplies interesting examples of how conversations via messenger platforms can go and

how third parties (services) like Twitter and FaceTime 'can listen in' and butt in if and when needed and desired. Easy and safe, as Libov calls it.

4.2 Be prepared for speech

Text definitely has its advantages. As yet, no definitive judgment can be passed as to whether text will remain dominant. In any case the new possibility to speak directly with a bot already presents itself. This can be via the PC, the smartphone with Siri, TV or Amazon Echo.

At this stage we find it hard to imagine that we start a conversation with a device. But then, nor could we imagine fifteen years ago that we would make a phone call in the supermarket, train or car; and that is perfectly common practice nowadays.²¹

Zuckerberg's dream

In his New Year's message of 2016 Zuckerberg says that this year will be devoted to 'inventing'. He aims to build a simple artificial intelligence that helps him run the home and his work. His good resolutions lists of former years mention things like 'stop wearing a tie' and 'learn Chinese'. Zuckerberg envisages his AI ambition as follows: 'I'll start with the technology that we already have and then I'll teach it to recognize my voice to operate everything in the house. Music, lights, temperature and so on. I'll teach the technology to let my friends in by identifying their faces when they ring the bell. And I'll also teach the technology to warn me when something is the matter in the bedroom of my daughter Max.' In reply to the tens of thousands of reactions to his message, Zuckerberg writes that he has already found one product that he is taken with: 'In the field of music Amazon Echo is pretty good. It's simple to control music with my voice while both my hands are busy tending to Max.'

21 'Heeft u een mobiele telefoon?' ('Do you have a mobile phone?'), Frans Bromet (1999), <https://www.youtube.com/watch?v=0u0RQk2Z1-o>



Basically, Amazon Echo, with its digital assistant Alexa, also forms a conversation platform. Products of companies like Philips (Hue lamps) and Nest (intelligent thermostats) are already available so that you can adjust your lighting or heating. But meanwhile Spotify and Uber are also on Echo. Instead of ordering a taxi yourself you can simply ask Alexa to do it and she will arrange it all. No text but speech on this platform, and

no smartphone but a device the size of a carton of milk in the living room. Amazon releases no sales figures, so it is hard to establish the volume of the success. It is certain that the battle for the interface in the living room has only just started. For the time being other platforms are not coming within miles of the chat's popularity. But a voice command 'lights on, lights off', or a gesture, seems more natural than adding house lighting to your group of friends on WhatsApp.

In the same way that messaging and textbots are a good match, speech and the Internet of Things (IoT) are too, logically.

Shortcut is a virtual assistant that has the ambition to become the 'Siri of the Internet of Things'. You can operate the entire house with simple speech commands. But there are many more competitors, e.g., the Speaktoit Assistant²² in combination with Api.ai, the 'conversational UX platform' that



makes it possible to add this function to your own Internet of Things products via an API.

The four major speech assistants – Siri, Cortana, Echo and Google Now – are developing into platforms, just like WhatsApp. These

platforms can be unlocked via APIs. And they do more than just speech: they also transpose text into speech and vice versa.

The big four Virtual personal assistants



Siri Apple, 2011

Like others, can search for information, send text messages by voice, play music, book restaurant tables and more. Has a sense of humour, but struggles with speech recognition and more complicated requests. Free on Apple devices, not available on Android.



Google Now Google, 2012

Probably the best virtual assistant for the largest number of people, given the popularity of Gmail and Google Calendar, with which it integrates. Can find information and fulfil requests, and uses 'cards', which push reminders and useful information to users. Integrates with some third-party apps. Available on Android and Apple devices.



Cortana Microsoft, 2014

Good at voice recognition. Can read calendar and screen phone calls, and is proactive with reminders. Integrated across Windows devices, desktop and mobile. But limited availability beyond Microsoft products.



Echo Amazon, 2014

Strong understanding of voice commands from a distance. Unlike rivals wants to be a hub for the 'smart home'. Makes it easy to order items from Amazon through voice commands. Costs around \$180, whereas competitors are free.

Source: Economist.com

4.3 Conclusions and reflections

At the end of the day it is all sorts of virtual assistants that implement the ultimate customer experience, because they communicate with us in a natural manner and are aware of our deepest desires.²³ According to Forrester this is how we move from *customization* and *personalization* to *individualization*. Machine Intelligence plays a major role in this transition. We need Machine Intelligence to aggregate all our personal data, to filter and analyze them and eventually to transform them into an action or transaction.²⁴

Albert Wenger, a partner with venture capital investor Juneon Square Ventures (USV), goes one step further. In his TEDx Talk: 'A BIG idea, a bot idea', he refers to the 'right' to have yourself be represented by a bot. These digital alter egos carry out work on behalf of their physical counterparts, based on personal data, and earn an income with which their owners of flesh and blood are able to support themselves.²⁵ But to realize this, some steps will need to be taken first, the ultimate one being that

	Customization	Personalization	Individualization
Intent	Tailor products to use	Drive desirable actions/behaviors	Improve customer experience
Outcomes	Improved productivity, improved usability	Higher response/conversion rates, increased sales, increased retention	Higher customer satisfaction, reduced effort, increased relevance
Unit of analysis	None (everyone)	Segments or cohorts	Individuals
Area of focus	Application interface	Customer life cycle	Customer experience
What is effected	Functionality	Offers, recommendations, messages	Functionality, content, interaction
Examples	<ul style="list-style-type: none"> • My Yahoo • Flipboard • Preference menus 	<ul style="list-style-type: none"> • Amazon recommendations • Netflix • DemandBase • Targeted offers • Next-best action 	<ul style="list-style-type: none"> • Wells Fargo ATM UI • True&Co product listings • OutSider app • Nest Learning Thermostat • Zipcar

Source: Forrester Research, Inc.

23 'In de toekomst heeft iedereen een digitale butler' ('In the future everyone has a digital butler'), Marketing facts (2016), <http://www.marketingfacts.nl/cookies/?s=%2Fberichten%2Fin-de-toekomst-heeft-iedereen-een-digitale-butler>

24 'Micro Moments and the Shopper Journey', Harvard Business Review (2015), <http://think.storage.googleapis.com/docs/harvard-business-review-google-micromoments-shopper-journey.pdf>

25 'A BIG idea, a bot idea -- How smart policy will advance tech | Albert Wenger | TEDxNewYork', https://www.youtube.com/watch?v=t8qo7pzH_NM

Past	Sync Me	Store copies of my digital assets and keep it in sync across all end points and contexts.
	See Me	Know where I am (and have been) on the Internet and in the real world. Understand my mood and context to better align services.
Present	Know Me	Understand what I want and need and proactively present it to me.
Future	Be Me	Act on my behalf based on learned or explicit rules.

The future of the butler economy. Ultimately butlers and masters will become one.

master and butler become one (Be Me). The first two stages (Sync Me and See Me) were already started at some point in the past. The stage we find ourselves in today is that the butlers are acquiring more and more knowledge about us to get to know us better (Know Me).

The future is still a long way away, but Wenger is posing the right question. Who do we instruct to manage our affairs? In the Be Me scenario the bot acts entirely in the interest of the individual. The bot must be able to bargain hard for the best deal. But the messaging platforms are running the show. When conversational commerce breaks through, the next question is what the consequences will be for net neutrality. If messaging is the filter for the content, who will guarantee free access to information? The power of the messaging platforms is great as it is. Via its Instant Pages, Facebook is already offering

media companies the opportunity to publish their content directly on their platform. So there is no need for users to leave Facebook. This effect will only grow stronger with all sorts of chatbots in Facebook Messenger. Will Facebook be the future Internet? But in whose interest will the bots act then?

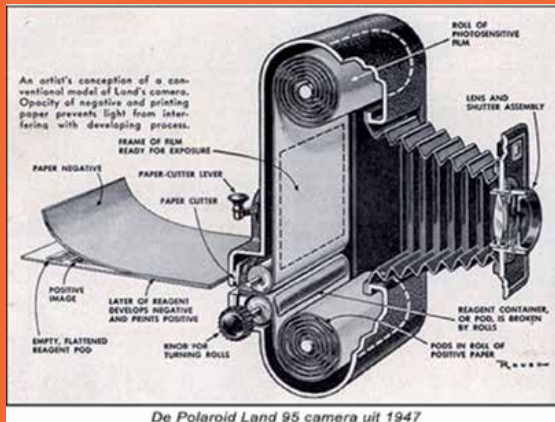
This Be Me scenario may go a bit far. Another 'big idea, bot idea' may be a bit less remote, namely that the bot economy is owned by everyone and not just by the business world. Everyone can make bots and pursue his own ambitions. Roger, for example, built a bot²⁶ that aims to fob off call center salesmen. When you get a call from a salesman, you can redirect the call to the bot Jolly Roger Telephone. It is programmed in such a way that it presents itself as a somewhat disturbed man, the aim being to keep the salesman on the line as long as possible.

The conversations that the bots strike up with us, or the other way around, take place in micro moments in our lives. Waiting for the bus or bored by the TV program we are watching, we get on the phone and start up a conversation. According to Forrester Research this is a huge opportunity for companies.²⁷ Although these micro moments last only a split second, they are unique contact moments where companies can actually demonstrate their relevance by meeting their customers' needs.

'A micro moment is a mobile moment that requires only a glance to identify, and delivers quick information that you can either consume or act on immediately.'

Josh Bernoff, Forrester Research

Instant gratification is the new religion



The Polaroid symbolizes what we call 'instant gratification' in fine words. The customer wants to see instant results. Snip-snap-click and: an instant photo. The consumer will not wait forever.



I-want-to-know moments

65%

of online consumers look up more information online now versus a few years ago.

66%

of smartphone users turn to their phones to look up something they saw in a TV commercial.



I-want-to-go moments

2X

increase in 'near me' search interest in the past year.

82%

of smartphone users use a search engine when looking for a local business.



I-want-to-do moments

91%

of smartphone users turn to their phones for ideas while doing a task.

100M+

hours of 'how-to' content have been watched on YouTube so far this year.



I-want-to-buy moments

822%

of smartphone users consult their phones while in a store deciding what to buy.

29%

increase in mobile conversion rates in the past year.

It has long been, and still is, impossible for humans to identify a micro moment. For this we require the application of information technology. This is, of course, technology that literally listens to us and constantly keeps an eye on things over our shoulders, to be available for help 24/7. This technology is going to play a major role in the years to come. Marketing guru Brian Solis says that micro moments are the new reality in marketing.²⁸ According to Solis, the consumer's 'short-attention-span theater' must be taken as the point of departure,

because the customer journey that everyone is on about, is dominated by the chaotic sum of all micro moments.²⁹

A self-help guide made by Google to better capitalize on these micro moments can be downloaded from the Internet.³⁰ It is an interesting fact that Google, of all organizations, is in danger of getting into trouble when conversational commerce advances. The messenger platforms compete with Google for the very same micro moments of attention.

28 'Google's Micro-Moment: Why It's A Game Changer For CMOs', <http://www.forbes.com/sites/onmarketing/2015/04/09/googles-micro-moment-why-its-a-game-changer-for-cmos/#5f0761fb22b4>

29 'Micro-Moments: Your Guide to Winning the Shift to Mobile', <https://www.thinkwithgoogle.com/collections/micromoments-guide.html>

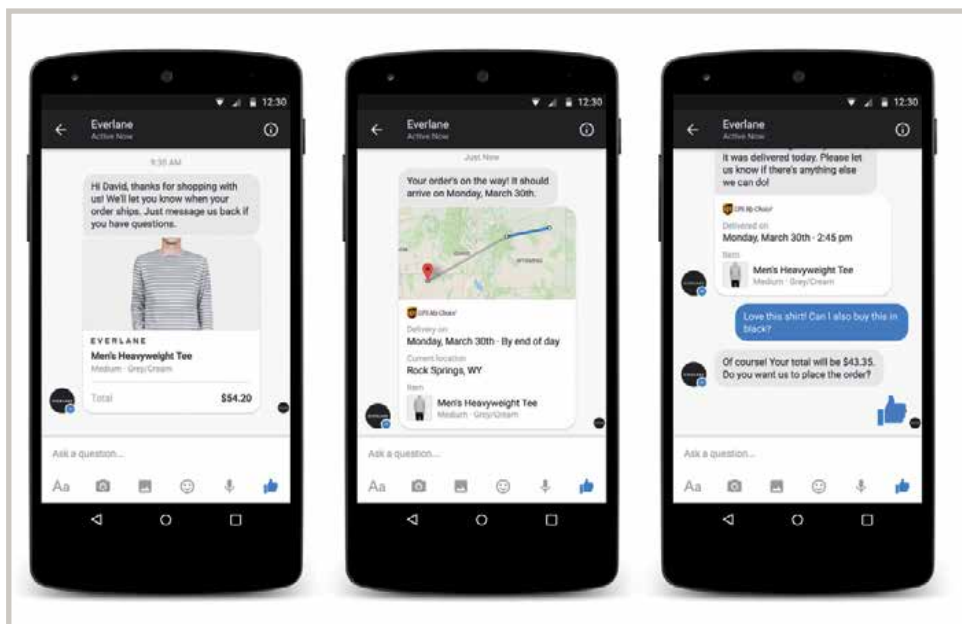
30 <https://www.thinkwithgoogle.com/collections/micromoments.html>

5.1 From conversation to conversion in a micro moment

The whole journey made by a customer – from buying to after-sales – is included in the conversation and offers the opportunity of an extra action time and again. All this is taking place ‘as one goes along’, in other words in the micro moments when people get on the phone and continue a conversation that they started some time before. Conversational commerce means

more conversion, because the clicks occur in the dialogue that the customer would like to establish. Below you will find an example of how retailer Everlane does this from the moment the invoice is sent.

With respect to payment, numerous new FinTech solutions are available, for example that of Bliss.



Everlane on Facebook Messenger covers the entire customer journey – from receiving the invoice, via track-and-trace of the product to placing an additional order.

'Messaging + Payments = Bliss

Accepting payment from your customers has never been easier. Smart phone or not, customers can chat with you via SMS, and complete transactions by simply texting the payment amount to your Rhombus number. Your customers can securely link their debit cards to Rhombus; our bank-grade security keeps their information safe.'

5.2 Conclusions and reflections

Ever since the advent of the smart-phone, micro moments are more and more often filled by checking mail or opening an app, e.g., WhatsApp or another chat platform. Messaging will increase with the advent of the chatbots, the run on attention will increase, and so the fight for the many micro moments of attention will increase. For the bot strategy of any organization this means that conversations need to be relevant in the user's view. What is relevant will further take shape, but it is to be expected that many infotainment services will pop up wherever people are trying to find distraction. The media craze will increase rather than decrease, and it is in this fight for attention that the competition will explode.

It remains to be seen whether it is a good development to throw ourselves deeper into media. Will all these robots make us dumber or smarter? It is a question that

author Nicholas Carr highlighted in his book *The Shallows*. Carr feels that technology makes us dumber because it is a source of distraction tending to make us shallower. He arrived at this conclusion after studying the use of apps. It would be safe to make the same assumption when it comes to chatbots. And will these smart bots render us redundant in the workplace? When digital colleagues will take over more and more of our work, what work remains for people? In the book *The Second Machine Age*, Andrew McAfee and Erik Brynjolfsson demonstrate that not only do machines replace our physical strength, they will also increasingly take over our brain-power. Chatbots will take over (parts of) our mental capacity more than anything else. What kind of work will be left for us? In the next chapter we will go into the possibility of employing bots in the workplace.



BOT CONVERSATIONS IN THE WORKPLACE

Apart from conversational commerce we now also have the concept of the 'conversational office'.³¹ The thing is that the office is particularly suitable for a more intelligent work support by bots. So after the mobile office era we now get a conversational office era. The great breakthrough in the conversational office era is not only that employees participate in the conversation, but all kinds of bots join in as well. What comes to mind here is a business travel bot (like Concur) which arranges foreign trips for employees, or an expense account bot (like Birdly) which checks and pays out all the bills submitted by employees, or an HR bot (like Ivy) which can help employees with questions about their pay, for example. So employees need just one environment, like Slack, where they are assisted by various bots to enable them to do their work as smoothly and efficiently as possible. Slack is a relatively new collaboration platform (started in 2013) and has around one million daily users. When it comes to bots, Slack takes a very clear position. Amir Shevat, head of developer relations with software company Slack, describes it as follows:

'The real breakthrough in the conversational office era, is that office workers (aka people) are not the only ones joining the conversation – it seems that office computerized systems and services are making themselves available through this conversational interface as well.'

May we expect to see and experience algorithms as 'regular' colleagues in the future? This is certainly what Ben Brown, co-founder

of XOXCO and maker of the bot Howdy for the Slack platform,³² is convinced of. He introduces the digital colleague:

31 <https://medium.com/slack-developer-blog/the-era-of-the-conversational-office-e4188d517c64#.hk0bmns2j>

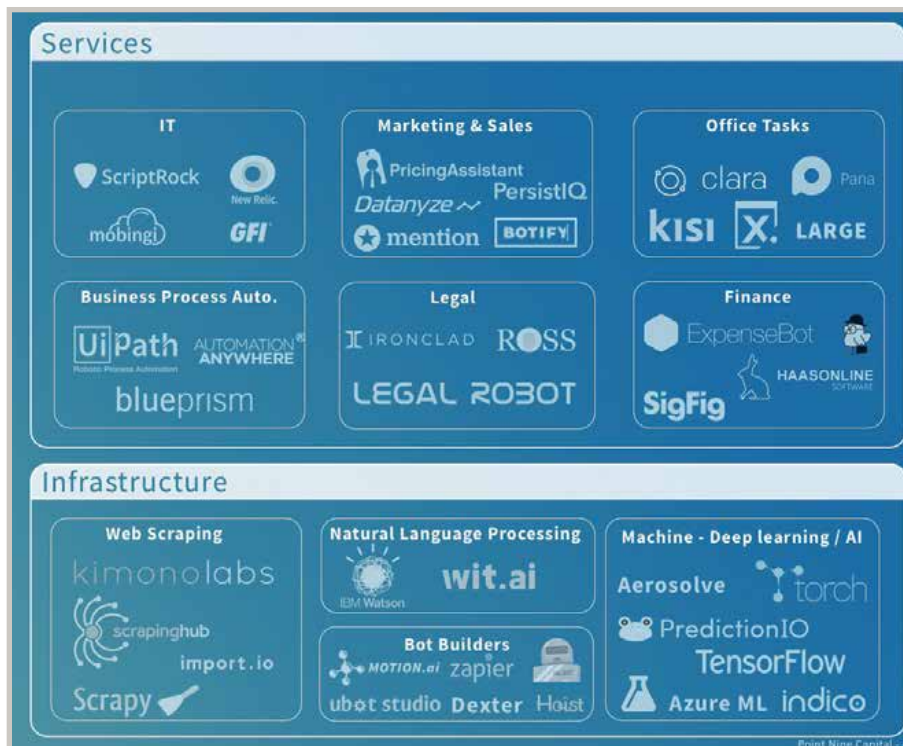
32 <https://blog.howdy.ai/your-new-digital-coworker-67456b7c322f>

‘The digital coworker – a piece of software that works alongside you at your job and participates in the day to day activities of your company as an active and engaged member of the team.’

According to Brown, a digital colleague not only takes care of boring, repetitive and routine jobs, it also anticipates the needs of the physical employee. The bot asks what it can do for you and continues to do so: ‘They ask you what

you need, and then they do it for you.’ Howdy, for example, can arrange a meeting with all project participants relatively easily. Where formerly a secretary had to consult the diaries of all the employees involved to set a time for the meeting, Howdy can communicate with all employees at the same time to call a meeting.

Clement Vouillon, who works for venture capital investor Point Nine Capital as an analyst, performed extensive research into the use of software bots in the workplace. Bots are available in every aspect of industry and commerce, from HR to Legal, from Finance to Marketing.



The landscape of colleague bots. This extends from legal and IT to finance and all kinds of office activities.

6.1 Robo-doctors, -chefs, -lawyers and -consultants are becoming increasingly intelligent

IBM's Watson is universally praised for his intelligence. Indeed, as early as five years ago Watson defeated the top two candidates in the quiz *Jeopardy* based on knowledge learnt from the advanced analysis of millions of pages of text. Nowadays Watson is not only used as a consultant in the medical sector to give advice to doctors, but also as a sous chef to create new recipes. We can ask a different version of Watson, called ROSS, for legal advice. And Watson is even installed in the brain of a toy dinosaur. Not only can this dinosaur listen and speak, but it can also teach itself new information. In fact it goes through the very same learning curve as the child that plays with it. During an episode of the Dutch talk show *RTL Late Night* the intelligent dino was even able to answer questions from host Humberto Tan.

And even Watson is out of date as we speak. His successor, Celia (Cognitive Environments Laboratory Intelligent Assistant), is raring to get to work in the business world. Celia is Watson, but with a human veneer. According to IBM she is 'the ideal employee'. Celia is far better able than Watson to establish a dialogue with 'the colleagues'. So obviously they are putting a lot of work into the interface, which reminds us of the movie *Minority Report*. Celia is also better than Watson at explaining her answers and does not stop at just giving an answer to a question. This creates a basis for better relations. After all, the basis of a good dialogue is to gain insight into the other's way of thinking.

Since late 2015, a bot has been employed to present the weather in the Chinese TV program *Morning*



News. The software bot Xiaoice gives three prognoses during the two-hour daily show which is oriented at local, national and international situations. The information used by Xiaoice to explain her

weather forecast comes from official meteorological sources. The chatbot even advises watchers to wrap up well when it is cold and not to practice outdoor sports when the air quality is poor.



The robot that reads the weather forecast. It is no longer science fiction, it is happening in China.

6.2 The bot as boss

Even the manager falls victim to the 'appetite' of the bots. Venture capital investor Deep Knowledge Ventures from Hong Kong, for example, announced in 2014 that as the first company in the world it had appointed a software program member of the Executive Board. VITAL is the name of the new member: Validating Investment Tool for Advancing Life Sciences. The program was developed by Aging Analytics UK and has as much power of decision as the human

members of the Board. The program will not take a seat at the table of the Board, but will supply the Board with the necessary input to make better investment decisions. According to Dmitry Kaminskiy, a senior partner in the company, human intuition combined with machine logic results in a perfect team. This way, the risk of making wrong decisions is drastically reduced. Meanwhile the McCann advertising agency has also engaged a robot for a top position: they now have a robot working

as creative director. President and CEO of McCann Japan, Yasuyuki

Katagi, said the following in this context:

'Artificial intelligence is already being used to create a wide variety of entertainment, including music, movies, and TV drama, so we're very enthusiastic about the potential of AI-CD for the future of ad creation. The whole company is 100 per cent on board to support the development of our AI employee.'

6.3 Conclusions and reflections

Conversational commerce and the conversational office are based on the same principles. In this sense there is no difference, except that the perspective is slightly different. In the consumer's eyes the bot is a butler, and a colleague in the eyes of an employee. There is plenty of food for thought. How exactly will those cognitive players operate in the workplace? Will the 'bot as boss' concept be accepted? And then the question arises who is responsible for the bot's actions. What comes to mind are the followers of 4chan, who in a day's time transformed the chatbot Tay of Microsoft into a nazi character that denied the Holocaust.³³ Can this sort of thing happen to your own bots? And what about the Random Darknet Shopper that ordered ten ecstasy pills on its own initiative? Do we have to be concerned about the

'social life of algorithms'? If one bot strikes up a conversation with another and we are excluded, what is going to happen? This is how the Flash Crash could happen, where things went terribly wrong with algorithms (quants), causing a crash on the exchange. Billions of dollars vanished into thin air because an algorithm misinterpreted a sign on the market. Who controls who in the future and who is still able to understand the math that gives life to these algorithms? The easy way to avoid the risk is simply to leave it alone. But be honest: is not an advanced bot far better able to keep abreast with medical professional literature? It is not inconceivable that it will shortly be mandatory for doctors to use this knowledge, at the risk of being blamed for negligence if they do not.

Sometimes, when a new technology reveals itself, we have a fair idea of what the impact will be. But more often we just do not know in what direction the technology is going to develop and what our reaction will be. Anyway, people-fication, the butler economy, micro moments and bots in the workplace are four starting points to learn to better understand these new technological opportunities. As tools for further discussion and strategic thinking in your organization they point out different aspects that can each play a decisive role in terms of further success of your actions.

The reflections at the end of the chapters illustrate the fact that there is still a lot of uncertainty and that developments are unpredictable. There are, for instance, several scenarios for the impact of bots on employment. How man and machine will cooperate depends on several factors: social, psychological and legal factors, for example, along with economic. Some studies forecast job losses, but others predict that no jobs will be lost, such as a recent study from the Fraunhofer Institute.³⁴

Experimenting and watching closely is always the best motto. Indeed, in this empiricism alone shall we find the answers to all our questions, a selection of which we presented at the end of each chapter.

So the most pragmatic advice is to get to work yourself – with the two possibilities offered by Facebook to

build a bot. Or with the Microsoft Bot platform. If you already have some experience with scripted chatbots on your website, this information may come in useful.

We are now at the beginning of the bot era, so at this stage companies can still afford to make mistakes. But the patience of the consumer (and of the employee) is not limitless. Therefore it is important to think twice about what personality your organization aims to give to the bot. They are just like people, you see ...

34 <https://ec.europa.eu/digital-single-market/en/news/fresh-look-use-robots-shows-positive-effect-automation>

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