



## AI-powered customer support robots bring human touch to virtual world

Fusing human psychology with an advanced artificial intelligence engine, MyCyberTwin's virtual humans are being used by organisations like NASA and National Australia Bank to improve their customer support levels.

[Tim Lohman](#) 08 July, 2009 02:29:00

<http://www.cio.com.au/article/309966/ai-powered-customer-support-robots-bring-human-touch-virtual-world>

“More Human Than Human” may have been the slogan of the fictional Tyrell Corporation in the sci-fi film classic *Blade Runner*, but it could equally apply to Australian company MyCyberTwin, a provider of artificial-intelligence powered virtual staff.

MyCyberTwin technology is designed to allow almost anyone to build a virtual, artificial human -- called a CyberTwin -- which can handle such tasks as personalised customer support, client sales or even entertainment and companionship. CyberTwins can take the form of a clone of yourself, or a representative of your company, and they can live in almost any digital environment, including Web sites, virtual worlds, blogs, social network pages and mobile phones.

Touted as “always accurate, always in a good mood, able to speak many languages, and work day and night”, CyberTwins are currently available for free to personal and to small businesses users (for the first 100 chats only).

[SLIDESHOW: Check out MyCyberTwins in action in these pictures](#)



At the enterprise level, however, many large organisations are paying for more sophisticated versions of CyberTwins to serve as advanced customer support robots that live on the Web and interact directly with clients.

Fusing human psychology with an advanced artificial intelligence (AI) engine, MyCyberTwin's virtual humans allow organisations such as NASA, AMP and National Australia Bank (NAB), to improve their customer support levels. Communicating through instant messaging, or

voice recognition with third party plug-ins, the Web-based AI constructs are capable of interacting with thousands of clients a second, 24/7, with higher accuracy, up-sell rates and customer satisfaction levels than real people, according to MyCyberTwin CEO, Liesl Capper.

CyberTwins can not only co-browse Web sites with a client to look through the attributes of various credit card offers or hold a user's hand through an Internet banking transaction, but they can also be deployed in games, mobile devices such as the iPhone, and in virtual worlds such as Second Life.



Much of the CyberTwins' capabilities come down to a proprietary artificial intelligence system which allows users to create CyberTwins using a relatively simple construction application. Using its in-house Instant IQ system, MyCyberTwin takes template robot personalities with pre-trained knowledge models, uploads client-specific data, such as product information, and then lets the CyberTwin train itself on the new data. Some human editorial work is then required to tweak the CyberTwin to meet individual business objectives of the organisation, such as reducing product application drop out rates or encouraging greater customer self-help, says John

Zakos CIO at MyCyberTwin. "It's not just a matter of uploading all the questions and answers, and information associated with a client; it's about building the CyberTwin to achieve business objectives, and having performance indicators to show that they're being met," he says.

"Using analytics, organisations often end up modifying content on their sites based on what they're learning through the CyberTwin about what the customer is talking about."

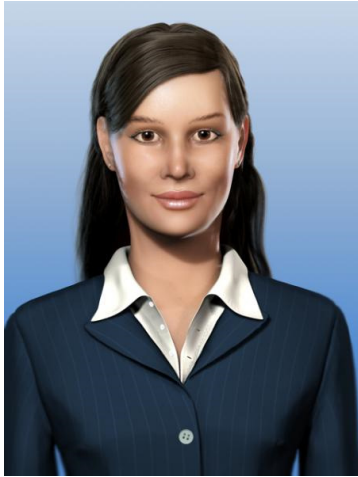
Having the CyberTwin be able to teach itself and learn from experience and feedback are essential for creating a feasible, working AI engine, Capper says.

"On average, a large enterprise will have 85,000-120,000 potential inputs that a customer can give them, so if you sat down and scripted every one of those you would end up with an AI that is flat and which would take for ever to code," she says.

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In contrast, the CyberTwin is able to remember on average 2000 points of customer-relevant information, and 100-150 profile variables -- nuances about the individual being spoken to, such as the preferred formality of address and past conversation topics -- to create its life-like responses.

"Unlike a dumb FAQ, or search engine, the CyberTwin will ask to let it help you. It will ask you a couple of questions to figure out how technically savvy you are, then go down a long path profiling you all the time based on the conversation," she says.



Along with its learning capabilities, strong language detection capabilities are also a major source of the realism. Using a translation engine, the platform can handle slang, abbreviated queries, misspellings and translate it to standard English, Capper says.

“Our first 20,000 CyberTwins spent a lot of time in social networking in places like MySpace where the language is barely distinguishable as English,” she says. “If the CyberTwin comes across something it hasn’t encountered before it can look at all the words in the sentence, weight them, then make a very accurate guess at the meaning.”

In a deployment for ACP magazines, part of Publishing and Broadcasting Limited, MyCyberTwin deployed CyberTwins as the Web personalities of a number of magazine titles for readers to talk to and interact with, Capper says. The results were surprising.

“They put human photos on the robots and didn’t identify themselves as being AI’s, and 95 percent of users on those sites could not work out they were AI’s,” Capper says. “So, we’ve never bothered entering the Turing test [the test to gauge a machine’s ability to demonstrate intelligence] as we have had the opportunity to do it with clients in real life, which is a better test than a bunch of computer scientists trying to fool your AI.

“Even among enterprise clients, between 67 and 95 percent of their customers feel that the AI’s are human. Even when it is identified as automated chat, people still choose to interact with the AI as if it was a human.”

A big part of the realism of CyberTwins is their ability to provide realistic, intelligent responses to human queries. If for example, a customer is using aggressive language or is abusing a CyberTwin, it can detect this and push back, like a real person.

“If robots are too submissive -- ‘yes, sir you’re right’, ‘I’m sorry sir’-- then what is that going to teach the human about how they can deal with the organisation?” Capper says. “If they get a real human on the phone, how are they going to deal with them? We train the CyberTwin to ask that such language not be used. If they push back, then it is more realistic.”

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MyCyberTwin also applies personality assessments and similar psychological profiling techniques in an effort to create CyberTwins which are the embodiment of its clients’ organisations.

“We go into a client and ask them what the personality of their brand is: are you a playful, impulsive, warm-hearted organisation, or are you more formal?” she says. “If you could get your ideal customer service staff in front of us, what would they be like?”

A client may also want different personas for different sides of the business; the investment side might be more formal, and the new business side more friendly, Capper adds.

## Banking and finance

Faced with increased pressure from customers for better service, while at the same time experiencing staff cuts, banking and financial institutions have been some of the early adopters of the AI technology.

“Up until now, that situation has been solved with outsourcing which in a lot of cases is a toxic decision for an organisations, as you can’t control what is said to a customer to the extent you can with a robot,” Capper says.

In addition, service robots often complement the move to Web-based self-service models being adopted by many financial institutions, says MyCyberTwin CIO John Zakos.

The screenshot shows the NAB website's credit card comparison page. The main heading is "The confidence to pick the right credit card". Below this is a table comparing various credit cards. To the right, there is a chat window titled "NAB Online Assistant" with a user's question and the assistant's response.

	NAB Low-Rate Visa Card	NAB Visa Mile	NAB Standard Card	NAB Gold Card	Velocity NAB Standard Card	Velocity NAB Gold Card™	NAB Classic Gold Card	NAB Classic Platinum Card™
Apply Now	apply now +	apply now +	apply now +	apply now +	apply now +	apply now +	apply now +	apply now +
Annual card fee <sup>1</sup>	\$48.00	\$24.00	\$30.00	\$90.00	\$65.00	\$150.00	\$145.50	\$290.00
Interest rate (Purchases) <sup>2</sup>	10.99%	17.99%	17.89%	17.89%	17.99%	17.99%	17.99%	17.99%
Interest rate (Cash advances) <sup>2</sup>	19.99%	17.99%	17.89%	17.89%	17.99%	17.99%	17.99%	17.99%
Interest-free days on purchases <sup>2</sup>	Up to 55	Up to 55	Up to 44	Up to 44	Up to 44	Up to 44	Up to 44	Up to 44
Type of card available	Visa Card	Visa Card	Visa Card or MasterCard Card	Visa Card or MasterCard Card	Includes a NAB American Express® Card and Visa Card	Includes a NAB American Express® Card and Visa Card	Includes a NAB American Express® Card or a Visa Card	Includes a NAB American Express® Card and a Visa Card
Minimum credit limit	\$500.00	\$500.00	\$500.00	\$5,000.00	\$500.00	\$5,000.00	\$5,000.00	\$12,000.00
Additional information <sup>3</sup>	View	View	View	View	View	View	View	View

**Online Assistant**  
 You said: I would like to apply for a credit card  
 You can apply online right now.  
 Online Assistant can help you choose a card.  
 Or, if you know which card you'd like, select your card from our credit card comparison table and click on 'Apply Now'.  
 If you have another question, simply type it in the box below.  
 ask NAB

Related topics ...  
 • Which credit card best suits my needs?  
 • What information do I need to apply for a credit card?  
 • How do I apply for a NAB Visa Debit Card?

Tim Cullen, head of direct channels at the NAB’s retail and financial services division, says the bank has had a reasonable degree of success with the CyberTwins. Moving from an initial pilot in July last year, where the technology was deployed as an automated online chat client for the bank’s credit cards business, the CyberTwin has since grown to act as an online customer support agent for its Internet Banking unit, helping walk customers through transactions such as transferring international funds and exporting data between products.

“What attracted us to this technology was opening up that channel and having a feedback loop from our online customers that we wouldn’t normally have received,” Cullen says.

Research into the success of the CyberTwin deployment indicated that about 60 percent of customers using the chat client would have not contacted the bank otherwise, Cullen says.

“We have had close to 100,000 chat [sessions with customers] since going live, which is potentially more than 40,000 that wouldn’t have had otherwise,” he says. “It’s a great feedback loop for us. . . we are very pleased with the technology and will invest and expand it across the business.”

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The bank is now looking at deploying the CyberTwin as an automatic e-mail response agent. In effect, the CyberTwin intercepts e-mails sent to the bank’s customer support centre, reads and analyses them, and will write and send a reply if it believes it knows the answer to any questions contained in the e-mail.

“The vision is to have it be our online concierge, and have it give more direct offers to customers, be able to hand off to the contact centre, make appointments with a mobile banker, and connect customers with other parts of our Web site or business,” Cullen says.

Despite the success of the CyberTwin deployment, Cullen says there’s still a lot of monitoring and tweaking that needs to be done, particularly around knowledge and content management.

“We also have a level of compliance around what we can and can’t say to customers, so we need to be careful of the language we use,” he says. “There is a lot of reviewing around the content, but you need to establish the base sentence using a technical writer.”

Cullen says response times for an answer to a customer query have also been reduced from around 15 seconds with a human agent, to about two seconds with a AI agent. It also delivers context-relevant hyperlinks to drill down and get more information.

“With traditional help we never knew if we were solving our customers’ problems,” he says. “We now have a two-way conversation where we can find out where our deficiencies are and if we have a problem with our online service. You just don’t get that interactive customer feedback opportunity very often, and that has allowed us to significantly improve the content we have online, so we have expanded it and linked it with other applications.”

## **NASA**

According to Tom Soderstrom, IT CTO in the office of the CIO at NASA’s Jet Propulsion Laboratory in Pasadena, California, the organisation has been using a CyberTwin in Second Life to man its presence there dedicated to the Phoenix Mars Lander spacecraft.

The deployment has enabled the Second Life public to get quick answers to questions about the Phoenix spacecraft, mission, Mars and the prospects of finding signs of ancient life there.

“The good news about Second Life is that you know a person is always at the other side of an avatar,” Soderstrom says. “For enterprises, such as NASA and the Jet Propulsion Laboratory that’s also sometimes the bad news [as] it’s often too resource-intensive, but if

no one is “manning” the avatar, people get bored and walk away. Instead, in addition to the people-driven avatars, we [wanted] to have automated greeters, or cyber-robots, that could help educate the public.”

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Soderstrom says NASA plans to further the use of cyber-robots in Second Life and is looking at using the technology for expert training as its expands the mission information it makes available to the public.

## Future applications

According to MyCyberTwin CEO Capper, in time, AIs are likely to begin to move out of the Web and onto portable devices to assist in every day interaction and business tasks, such as automatically writing and replying to e-mails on your behalf.

CyberTwins could eventually emerge as concierges in the hospitality industry at hotels, reception staff in office towers, personal trainers, multi-lingual teachers helping people practice their English skills, or as companions for the elderly.

Many people may prefer to leave Kit, the AI-powered car driven by David Hasselhoff in the show *Knight Rider*, back in the 1980s, but cars with in-built CyberTwins are also a possibility one day, Capper says.

Similarly, CyberTwins can be embedded in fridges and robots to provide an instant conversation brain with the ability for the robot or fridge owner to customise the personality. They can also appear as intelligent marketers to profile and assess the buying public as they interact with a product or its Web site.

“We see our robots being in machines more and more over time,” she says. “People already have a relationship with their phones and GPS systems, and we think those things should have bigger brains.”

## References

- [Virtual Humans - Slideshow](#)

More about [AMP](#), [NASA](#), [NAB](#), [Publishing and Broadcasting](#), [etwork](#), [ASA](#), [Phoenix](#), [National Australia Bank](#)