THE FUTURE OF MESSAGING GUIDE

A2P to OTT, chat bots to smart machines … how the world's most powerful communication medium is shaping up for tomorrow

PREDICTING THE FUTURE OF PREDICTIVE TEXT

HOW A SIMPLE TEXT MAKES SHOPPING SAFER

WHAT HAPPENS WHEN MACHINES TEXT 'HELP'?

CAN A BOT TEACH YOU A LANGUAGE?

CAN YOU CHAT WITH THE NEWS?

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Welcome to the future of messaging

People say that the digital age is destroying our ability to communicate. We're staring at screens, avoiding conversation. But what are we doing when we're on our phones? Well, mostly conversing.

The truth is, people love to communicate. And mobile messaging is how billions choose to do it. We've seen this in the rise of SMS, which grew ten-fold from 2004 to 2014. And now there is a similar explosion in the use of chat apps like WhatsApp and WeChat.

But it's not just people who are chatting and texting. Businesses also choose mobile messaging. With good reason. According to Mobile Marketing Watch, text messages have a 98 per cent open rate (email is 20 per cent). And most are opened inside five seconds. As a result, the A2P (application to person) market is booming across all sectors – as enterprises embrace this trusted, reliable and cost-effective channel. Now, an exciting third trend is emerging: messaging by machine. Here, smart devices send alerts to signal their status, saving firms money and time. Then there are chat bots - virtual machines that could be the future of customer engagement.

So in this guide, we reveal the power of messaging in all its forms. Inside, you'll learn how companies use messaging to solve real business problems. We look at emerging platforms, and explore what's next for the medium.

The guide been commissioned by the global trade body Mobile Ecosystem Forum. It is supported by members of MEF's Future of Messaging Programme, which promotes best practice and innovation across the messaging ecosystem.

"Text messages have a 98 per cent open rate. And most are opened inside five seconds. This is why the A2P market is booming."

01

INTRODUCTION

Person to person messaging via SMS has peaked, but 'OTT' chat apps are attracting billions of users.

Meanwhile businesses are discovering the power of text as the world's most direct form of communication.

In this section, we look at the current state of messaging and analyse its key challenges and opportunities.

The mobile phone was invented for voice. But the people saw it differently. Text triumphed, and now the medium is ready for its next phase.

Personal, universal...
The unstoppable rise of text

* The A2P messaging market will be worth $58.75 billion in 2020 (Mobilesquared)

* Banks, retailers and OTT providers will account for 60 per cent of A2P traffic by 2017 (Telefonica Text Economy Report)

* 44 per cent of people prefer product and marketing messages via SMS (Direct Marketing Association)

* Businesses will send over 1.7 trillion A2P messages in 2016 (Portio Research)

*Developers built 30,000 bots in six months on Facebook Messenger

* People sent 8.3 trillion texts in 2016

* By 2018, the number of chat app users worldwide will reach two billion (eMarketer)

I n 2012, Austin Wierschke successfully defended his US National Texting Championship crown. The 17 year old texted 149 characters in 39 seconds with no spelling or punctuation errors. Impressive. But how long would it take to speak 149 characters? Actually, about five seconds.

In many obvious ways, voice is better than text. It's certainly faster. And yet 20 years since people sent SMS messages from user-unfriendly numeric keypads, text is clearly the dominant force in mobile.

Look at the numbers. According to Telefónica, mobile users currently send around 8.3 trillion text messages a year. And then there are the businesses. Companies, utilities, broadcasters, hospitals - they've all embraced the text alert as an affordable and reliable channel for customer engagement. Now, the so-called application-to-person market (A2P) is set to grow from 1.6 trillion text messages in 2015 to 1.76 trillion in 2018 (Portio Research).

To repeat, text has triumphed. According to a 2015 study by Infomate, Americans spend 26 minutes a day texting against six minutes on voice calls. So why is this? Part of it may be social reserve. But there are practical advantages too. The asynchronous nature of text may be the most significant. A text does not demand to be answered immediately like a call. It sits there unobtrusively, waiting for a response.

People like that. And so does business. Indeed, the benefits of text to firms are even more compelling. It's ubiquitous: anyone with a phone can use SMS – no matter what handset, operator, OS or country. It's (almost) always on because messages are transmitted over cellular networks, rather than 3/4G. And people respond very quickly to SMS. According to a Dynmark report, SMS has a 98 per cent open rate - and nine in ten texts are read within three seconds.

Of course, for all the dominance of mobile messaging, the medium is currently undergoing big changes. The

SMS channel is over 20 years old, and is beginning to be eclipsed – in the person-to-person space at least – by the so-called 'OTT' apps, which let users send messages over IP. The apps – WhatsApp, Facebook Messenger, WeChat, Viber and others – give people the ability to send video and photos, and easily set up closed groups. These are features that are not available via SMS.

Over to over the top
A 2016 study by the Mobile Ecosystem Forum revealed OTT apps are now favoured by a majority of end users. For example, 56 per cent of people say they regularly use Facebook Messenger, against 42 per cent for SMS. The shift from SMS to OTT in some use cases is real, though it should be stated that person to person SMS is not in decline, just changing. And in the A2P space the OTT apps have yet to make a serious impact. To re-state the above: SMS is universal and ubiquitous; OTT apps are not. This clearly matters to business.

Companies derive huge value from the simple ability to contact customers in a timely fashion.

This guide reveals some apposite examples. Consider Uber. It's hugely complex business that couldn't function without real time texts between riders and drivers. Or FICO, helping banks reduce fraud by texting customers at the moment of purchase to discover whether a flagged transaction is genuine.

More to come
Businesses across all verticals already leverage A2P messaging. But there's immense potential for more companies to explore the channel. The MEF study revealed that almost one in four respondents has yet to receive an SMS from any of the verticals listed.

Meanwhile, new possibilities are emerging such as messaging inside machines. Connected things need a way to talk to each other and cellular networks offer a better route than wi-fi for example. Operators' new networks will consume less power and potentially connect billions of devices simultaneously. They will enable machines to send diagnostic messages for years without battery issues. And dynamic SIMs will let them connect wherever they are shipped.

Chatbot cometh
The other big change coming to messaging concerns a different kind of machine – a virtual one. The huge popularity of messaging has led many to ask the following question: if people like texting so much, why not make it the option for 'talking' to digital services.

For example, say you want to find out a train time. You could open an app, click on a menu, find a drop down list of destinations, click on a departure time etc. Or you could go to Facebook Messenger and just ask an artificially intelligent bot. And it would answer quickly because it would know so much about you anyway.

This is happening now. Facebook has opened its bot API and already has many thousands of apps on its platform. The potential for so-called conversational commerce is immense. But it's not the only possibility. In this guide, we show how Quartz has created a bot that 'chats' the news, Duolingo uses bots to help people learn languages and Sage developed a bot accountant. The future of messaging is already here.

Enterprises on alert

In the consumer space, SMS has peaked. So is that the end of the boom years for text? Not a bit of it, says **OpenMarket's GM Jay Emmet**. He sees a stellar future for SMS in the enterprise.

In the tech world, one thing never changes and it's this: everything changes. The industry, its fans and its media are always looking for the next big thing. Fair enough. New things are exciting. The risk is to overlook the value of what we already have.

And so we come to SMS. The veteran mobile medium is now over 20 years old, and is often unfavourably compared with the new OTT messaging apps. The latter services can exchange rich media, set up closed groups, support gifs and a lot more. What can SMS do? Not as much. But that's the whole point. Texts can 'only' be read – but anywhere, and by anyone.

Jay Emmet, GM of messaging specialist OpenMarket, loves these limitations. He's worked with SMS for two decades and his enthusiasm is undimmed. "Facts are facts. Yes, its true SMS was born in the 90s, but its engine is proven, it's very useful and it's not going away,' he says. "The point about SMS is that it's in every handset and every network on the planet. And every human being is a trained user – there's no education process needed. SMS has a ubiquity that's unique. If you have a global or even regional need for omnipresent reach, there is no substitute for SMS."

Testing, testing
Of course, plenty of companies have a 'need for omnipresent reach', which is why Emmet is so bullish about the future of SMS in the enterprise. That said, the so-called A2P (application to person) market for text has been around for years. Why is it taking so long? Emmet believes it comes down to corporate inertia. He says: "Big corporations are conservative. You suggest to a Fortune 500 that they switch from email to text, and it's provocative. It takes them a long time to be convinced. Also, when they do commit, they'll test it first. (But) I really think SMS will become the preferred enterprise channel. And I predict that in three or four years more texts will be sent by businesses than consumers."

While Emmet argues for the ubiquity and universality of text, he also believes the medium has another key benefit: it is asynchronous. "Compare the experience of waiting on a voice call for 15 minutes with waiting 15 minutes for a text reply. People don't mind waiting when it's under their control. That's not the case with a voice call. And while my generation will put up with those calls, the new generation just won't," he says.

Engineering ROI
Needless to say, when customer care arguments are married to demonstrable cost savings, that's when enterprises sit up and listen. Emmet gives the example of one client, a cable company with a fleet of installation trucks. Every time its engineers miss an appointment because the customer is out, it costs $200. So when the company started to send texts half an hour before asking if people are home, missed calls fell by ten per cent.

Emmet says these savings are huge. "We're talking about a company that works hard in other areas of its operation to cut costs by a fraction of a per cent," he says. "They haven't just cut costs, they've also improved customer experience. Normally, you do one of those at the expense of the other."

This example reveals another reason why text can be so compelling: people always read them – typically within a minute. It's the best channel for anything time sensitive, though some companies have been slow to realise it. "We have an e-commerce customer that sends emails when transactions fail," says Emmet. "They send these emails – and no one opens them. So now they have started to send texts to remind people to look at their emails!"

> **" In three or four years more texts will be sent by businesses than by consumers."**

Jay Emmet,
GM of OpenMarket

Integrate expectations

Adding a mobile messaging function to enterprise systems is a must for businesses, says **Mike Willock, VP for EMEA Sales, SAP Mobile Services**...

For any enterprise embracing digital to reach customers, mobile and messaging is a key component and enabler. It's why enterprise software giant SAP bought Sybase 365 (now SAP Mobile Services). The acquisition opened up new, broader messaging and integration opportunities with existing products and as standalone solutions.

Mike Willock, the division's VP for EMEA Sales, explains: "Messaging continues to be one of the best channels for reach, simplicity, reliability and security. It offers enterprises an inexpensive yet highly effective way to communicate"

All verticals
The simple fact is, consumers prefer messaging as a communication channel. According to Ovum, over 70 per cent choose it over other media. This trend is true across all verticals – banking and finance, retail, social networking and media, OTTs, travel and transportation and healthcare. They all use it to acquire, retain and grow their customer engagement.

With enterprises looking to reach customers anytime anywhere and provide the best contextual experience, there is no better way than mobile messaging. The channel allows for assured reach, delivery and two-way engagement.

SAP Mobile Services is now working to make available mobile communications across all digital enterprises. Willock says: "This is extended to SAP product suites too as an integration for end customer value. Especially in cloud-based HR and marketing offerings, this integration enables enterprises to provide a richer and more complete experience to their end users.

"For example, an international organisation might use existing survey tools in the market to run a campaign. That's fine. But it would be its own little world.

"It wouldn't integrate with the CRM systems. You wouldn't be able to connect the results with who the contact people are, what are the next steps, what the billing issues are and so on. But in this new world, they have a dashboard that brings it together. It's all integrated."

Mobile v email
And the key point is that this is all happening on mobile, rather than the previous option for incoming communications: email. Willock adds: "As we all know, mobile is immediate and email is not. People can be signing contracts, approving credit notes and so on in real time from the phone. It doesn't sound like a big deal, but it makes a huge difference."

Of course, given the strategic nature of these communications, customers demand a certain level of quality. Willock says: "There are numerous offerings in the market with various price points and in this space cheapest is not always the best so enterprises need to understand and evaluate the right option for their end to end needs."

Holistic
With application-to-person (A2P) messaging on the rise in the short term, offerings need to be holistic, easy to integrate and provide reliable reach.

On the enterprise side, companies need to consider the role of messaging in their whole spectrum of customer engagement from acquisition to retention.

Mike Willock, VP for EMEA Sales, SAP Mobile Services

Is that really you?

Despite recent scare stories, SMS pass codes remain the safest form of two-factor authentication, says **Rob Malcolm, VP of marketing and online sales at CLX.**

For years, two factor authentication (2FA) was seen as an essential weapon in the fight against online fraud. Again and again, criminals easily bypassed passwords and PINs. Far safer then to have users enter proof that they own the device registered to the service - like a smartphone. Adding this secondary line of protection was a no-brainer. And the best way to do it was with a one-time passcode sent by SMS.

But in 2016, something happened. Headlines declared the age of SMS 2FA to be over. It's insecure, they said. They were reporting an announcement made by the National Institute of Science and Technology (NIST) in the US. It had found flaws in 2FA via SMS messages, and said it was considering these risks and may "deprecate" SMS in future standards.

The NIST was concerned that hackers could exploit flaws in the SS7 protocol that operators use to enable roaming. They could fool the network into thinking a device is on another network and thereby allow communications to be intercepted.

Exaggerated
And it was right. Hackers can exploit this loophole. But according to Rob Malcolm, VP Marketing at CLX, the risk has been hugely over-exaggerated. He says: "Really, the only people who could repeatedly exploit this flaw at scale would be rogue employees inside of a GSM network. It's the equivalent of a Facebook staffer accessing your Facebook account. So, yes, it is a risk to be taken seriously, but I think it's been exaggerated."

Malcolm adds that the reaction against SMS ignores the fact that it is generally safe and – most important – widely used. "We must be realistic and offer security that people will actually adopt," he says.

"There's always a balance between security and ease of use. In this respect 2FA with SMS is the best option we have. It's fast and people know how to use it. We should think hard about dismissing it when it's so popular. We can't have users going back to just user name and password, which they will if we take 2FA with SMS away."

"I think saying we should deprecate SMS for OOB authentication because of these vulnerabilities is like saying we should deprecate TCP/IP because of a vulnerability in a firewall or in SSL. Clearly the solution is to fix the vulnerabilities, not abandoning the use SMS for two factor authentication."

Gullibility
Malcolm has observed that as much as 20 per cent of all A2P (application to person) messaging on his network comes from authentication. Banks, social networks and others have clearly found the process effective. He adds that many operators are now installing SS7 firewalls to mitigate against the above risk.

Rob Malcolm, VP of marketing and online sales, CLX

While it's always possible to close loopholes in a system, it's harder to reduce people's tendency to be 'taken in'. The fact is that social engineering – and not technical hacks – is behind most attacks. In the case of 2FA with SMS, it's criminals persuading a call centre agent to deactivate the original SIM, and provide a new one. Or phishing users with a spoof text message or email.

Malcolm laments that these attacks exist, but believes SMS two factor authentication can help. He says: "99 per cent of attacks are by social engineering rather than any kind of technical hack. I'd argue that 2FA can help to reduce these attacks, because it makes them so much more complex than merely trying to gain someone's user name or password."

02

USE CASES

More and more companies are using mobile messaging to improve customer engagement, make services more efficient, generate income or save money.

In this section we highlight real use cases by train operators, banks, schools and more.

Keeping calm at the station

Virgin Trains uses simple text alerts to reduce passenger surge at one of Britain's busiest stations. **Steve Gooder, head of digital technology at Virgin Trains,** explains how...

"The challenge was finding a way to tackle congestion without changing the systems at the station."

The 7pm London to Glasgow Virgin train is popular to put it mildly. This is an extremely in-demand service at all times, but at 7pm the price drops. Inevitably, demand soars. And that means congestion as huge numbers of people stand in front of the departure screens waiting for the platform to be announced.

But 20 per cent of these passengers – pensioners, and those with families or disabilities – get a covert headstart. They head for the train 75 seconds before the surge begins. That headstart breaks up the traffic. Everyone benefits. And it's all thanks to SMS.

The text project is the brainchild of Virgin Trains, which is based at Euston and uses the hub as its 'home' station. It kicked off the service in February 2016 after months of thinking about these surges on the concourse. After all, according to Network Rail,

71 million people a year pass through Euston station in London. That's on a par with Heathrow. Except smaller. Much smaller. Steve Gooder, head of digital technology at Virgin Trains, says: "We take the congestion issue very seriously because we don't just care about what happens on our trains. We think about the end to end journey. And if you're caught in a crush, that's not the best start."

Split the pack
The challenge for Virgin Trains was finding a way to tackle congestion without changing the systems at the station. Why? Because Virgin Trains doesn't run Euston. Network Rail does. "We were dealing with legacy train issues," says Gooder. "We couldn't re-engineer the station or split the train in two or make it leave later. So we concluded that the best way to attack the problem was to identify a subset of travellers and give them advanced notice – to split the pack, so to speak. And the best way to do that was through text."

Gooder and his colleagues devised a process that integrates with the screen announcement system. When the button is pressed to confirm the platform, there's always a 75 second delay before it is displayed. At this point the system batch messages texts to the priority group, who are identified when they buy their tickets online. It can also send an SMS message 20 minutes earlier to confirm a train is being prepared.

Now or never
The immediacy of SMS made it the perfect medium for the project. But there were still wrinkles for Virgin and its messaging partner OpenMarket. Gooder says: "We had to work around some scenarios. For example, if a customer is on the underground when the message is sent, we can't have them receiving a text when they arrive at Euston saying the train is ready when it has already left." Happily, that has not happened. The system won't re-send a message if it is not opened within a few seconds.

Gooder is delighted with the results. He says the company's Net Advocacy Score (which gauges the loyalty of a firm's customer relationships) has risen 12 per cent among those that use the service. And sometimes he tracks the impact in the most unscientific way – by popping out of his office, standing at the back of the station and watching.

Raising the flag on card fraud

FICO helps banks combat fraud by sending texts to cardholders at the moment of purchase. **Gabriel Hopkins, senior director of product management at FICO** explains why it works so well...

E very time a bank flags up what it thinks might be a suspect transaction it has three choices: decline it (and risk annoying an honest customer); approve it (and reward a criminal); contact the cardholder to see if it's genuine. The latter is clearly the best option. But for years it was not possible. Now, thanks to smartphones, it is.

Which is very interesting to FICO. The US company has been combating financial fraud for 60 years. More accurately, it's been in the business of credit scoring and analytics. The company began by applying maths to the probability that a person could pay back a loan. Before FICO, such decisions lay at the whim of the bank manager. The obvious superiority of the FICO system meant the company grew rapidly. It became an expert in using advanced analytics to detect and predict all kinds of consumer behaviours, including abnormal activity that could be fraud.

Today, FICO protects 2.5 billion card accounts, and nearly two-thirds of all credit card transactions. It does this mostly via its Falcon Fraud Manager software, which uses artificial intelligence to help financial institutions detect fraud – with minimal impact to customers. FICO says Falcon reduces losses from payment card fraud by up to 50 per cent.

And a key reason it can do this is the simple text alert at the point of sale. FICO added a mobile dimension to Falcon when it acquired Adeptra, whose solutions integrate voice, SMS, email and other channels back into a business's host system. Today, its Customer Communication Services function sends 300,000 texts a day to customers in the EU and 150,000 to cardholders in the US and Asia respectively.

Gabriel Hopkins, senior director of product management at FICO, says: "Previously, banks had

desks of fraud analysts and basically they would call and ask 'did you buy this iPad?'. Well, we automate the hell out of that process. And recently we added SMS as an option for contacting the cardholder. It's a fantastic channel. It helps us deal with high volumes without hiring more people. And, more important, customers like it."

Convenience
Why do they like it? Well, partly it's practical. A customer in the middle of a transaction might not take a call from an unknown number. SMS is also asynchronous, so a cardholder can read the alert and respond when convenient. FICO works with messaging aggregator OpenMarket to ensure texts are sent (and arrive) promptly. But even when a message is delayed (because a recipient is out of range, for example), it is still productive.

Hopkins explains: "Obviously, immediacy is good when you're tackling fraud as it happens. But if a person gets a text a minute later or even 20 minutes later, it can be reassuring. As a customer, you might trust a card more if you get good communication."

Water proof
Adding this extra layer of security to card transactions has had a huge impact. Hopkins says it saves one bank customer tens of millions of pounds in a year. And it's not just banks that benefit. FICO has also worked with Thames Water to automate voice and text calls to customers with overdue bills. These customers can pay without ever having to speak with a collections agent. And they do. In the first seven months of using the FICO system, Thames Water sent 345,000 automated voice calls and 95,000 text messages. It collected £10 million.

Now, FICO is keeping an eye on new messaging behaviours to ensure it reaches customers in their chosen channels. It's looking at chat apps, and also push notifications.

But it believes SMS will always have the edge. "The OTT platforms can offer a richer experience," says Hopkins. "There's the scope to put in a bank logo and more contextual information. But against that, they are closed and mostly they require the user to initiate the connection. The great thing about SMS is that it's open. No one has to set anything up. It just works."

> *"Adding this extra layer of security to card transactions has had a huge impact. It saves one bank customer tens of millions of pounds in a year."*

Chill! SMS provides a **cool machine fix**

When hugely expensive patient imaging machines warm up unexpectedly, the downtime costs a small fortune. **John Romero, a National Support Specialist (MRI) at Philips Healthcare**, explains how the problem is solved with text...

Like anyone, engineers working for Philips Healthcare pay special attention when texts arrive from a small group of contacts. Spouse, boss, accountant maybe. But nothing will make them jump up faster than when an SMS arrives from one of their patient imaging machines. Yes, you read that right. A text from a machine.

Fix me

In 2014, Philips Healthcare began fitting these expensive devices with the ability to send alerts to specified numbers. The messages essentially say: there's something wrong, come and fix me. And the pilot has been hugely successful. The initial test with 30 machines saved Philips Healthcare $250,000.

Patient imaging machines are hugely complex, medically essential devices. They use superconductor magnets that must be kept chilled at all times, and use liquid helium as a coolant.

However, when the chiller fails, so do all the other parts. A rise in temperature will turn the liquid to gas, which expands rapidly and causes a cascade that shuts down the cryogenics system. When this happens, engineers need to restore the machine at room temperature. Such failures can cost up to $100,000 to resolve.

Finding fault

John Romero, a national support specialist (MRI) at Philips Healthcare, was thinking about this problem in 2014. He says: "In the past, customers would call when a machine went down. But you can't expect a customer to anticipate a fault. Their priority is getting the patient image done, not the functioning of the machine, so they would keep working till it broke down. We had to figure out a way for the machine's thermostat itself to tell the engineers when something was wrong."

Eventually, Romero rigged up a module using a Raspberry Pi, which triggered a text alert when there was any change in temperature. Later he called in messaging specialist OpenMarket to handle the routing of the texts to the engineers. He says: "We considered email, but the point about text is that everyone has a phone, everyone can read SMS and messages get through instantly. Meanwhile working with the OpenMarket API meant we didn't have to worry about network coverage or permissions."

Success helps

It took Romero six months to build the prototype, but the tests were a success and now 150 machines across the US, Germany and India have the ability to send 'help' messages. In two years, they've sent thousands resulting in that $250,000 saving.

Interestingly, though the project has kept machines running, it has actually required more man hours to maintain. However, Romero says this is delivering unexpected benefits. He says: "With all the extra data
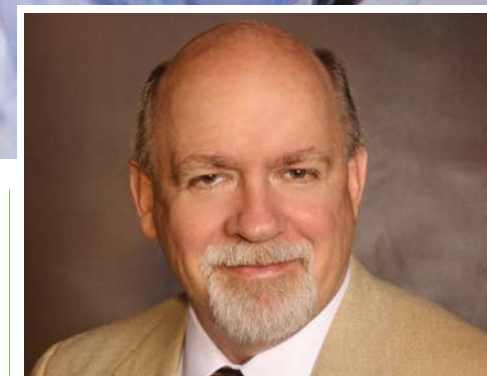
John Romero, national support specialist, Philips Healthcare

we have now on machine failures, we can build a more holistic view of what works. We can start thinking about replacing parts that we sense may be about to expire, for example, rather than waiting for an alert saying they are already failing."

Philips Healthcare is now looking to embed messaging functions into 3,000 machines worldwide, and is considering extending the concept to other departments for use in nuclear medicine, cat scan and cardio vascular systems.

Nudging children to better marks – with a text to parents

A simple well-worded SMS to parents has delivered real benefits in the classroom. Here's the full story from the UK's **Behavioural Insights Team…**

What's the best way to improve children's school grades? Obvious answers might include iPads for every pupil. Or new buildings. Or after-school classes. But what about a simple text to parents? A less obvious tactic perhaps, and certainly a cheaper one. But in a landmark trial in English schools, the experiment improved the average student's progress by a month.

Almost 16,000 students in 36 English schools took part in the year long trial, which was devised by Harvard Kennedy School, University of Bristol and the Behavioural Insights Team. The BIT – better known as the Nudge Unit – was set up by the UK government in 2010 to apply simple tactics based on the psychology human behaviour to improve public services. The aim is to make small changes but achieve large beneficial effects. The project bases its ideas on the 2008 book by Richard Thaler and Cass Sunstein called 'Nudge'. One of its early successes came in tax collection. When it told late taxpayers that most people in their town had already paid, payment rates went up by 15 per cent. This generated £30 million of extra revenue a year.

So could the same methods improve pupil performance? The researchers decided to experiment with text alerts to parents. Raj Chande, senior advisor at BIT, explains why: "We know that parental engagement is important, but it can be hard to reach parents who are disengaged from the education of their children. This is especially so in secondary education, where the curriculum is more difficult and children make their own way home so there isn't a 'school gate' culture. We looked at this and decided text would be the best way to reach them."

Needless to say, the wording of the texts was paramount. The team realised that a generic request to take more interest in their child's schoolwork might come across as heavy-handed. Instead, they chose a more neutral but specific approach. They devised around 30 texts (roughly one per week) about upcoming tests, missed homework and what their child had learnt that day. One example: "Your child has a science test coming up: make sure you ask them about cells when they get home".

One month better
To repeat, the trialists achieved one month of additional progress compared to other children. There was reduced absenteeism too. And the scheme was cheap. The cost per pupil was £5 – equivalent to roughly 0.1 per cent of the average school budget. It was also easy to implement. After all, most schools have an existing system for sending texts to parents usually reserved for alerts about school closures and so on.

The project wasn't wholly successful. While improvement came in maths, English was relatively unaffected. "I think this might be because maths learning is all done in school, while English attainment is affected much more by background. We'd like to explore this further" says Chande.

Bringing wisdom
Ultimately, the programme was vindicated not just by results but by the attitude of participants, who broadly welcomed the intervention. Chande says: "After a separate but similar experiment where we texted some kids' parents about upcoming maths tests, we then asked if they wanted us to tell their parents about their next maths test. Of the control group, whose parents we did not text, 40 per cent said yes. In the intervention group, whose parents we did text, 55 per cent said yes.

"They said they didn't necessarily enjoy the process, but they realised it was good for them. That reflects a level of wisdom, I think. And one parent said the scheme brought her closer to her daughter. A pretty profound impact for a simple text message."

> *"Some children said they didn't necessarily enjoy the process, but they realised it was good for them. That reflects a certain level of wisdom."*

What gives? Charities get smart with text

SMS has been a big boost to charitable giving. Now, says **Cancer Reseach UK's Lisa Elkins-Jarrett**, new tools are making it even more effective.

It's no exaggeration to say that SMS has transformed the charity sector. Most people want to give, but some can be reluctant to engage directly with charities for fear of a 'hard sell'. Text bypasses this. It's straightforward and immediate. Read rates average at around 95 per cent. For charities, which rely so much on spontaneous actions, this is very significant.

Lisa Elkins-Jarrett, product manager for marketing platforms (digital) at Cancer Research UK, says: "In a cluttered email world, SMS gives a chance to get across relevant and timely messages to supporters that help increase engagement and conversion."

Selfless selfies
These factors have delivered phenomenal results, raising sums in short time that would have been unthinkable before. In 2016, for example, Cancer Research UK asked women to post a make-up free selfie and donate £3 using the hashtag #nomakeupselfie. They were then asked to nominate three friends to do the same. Inside 48 hours, the campaign raised over £2 million. Another campaign – Stand Up To Cancer – seamlessly blended SMS donations with Gift Aid contributions. This helped to bring in more than £15 million.

Such successes have led to a huge increase in charitable text campaigns. However, the sheer popularity of the channel has led to complications. One is obvious: more texts equal more failures. Elkins-Jarrett says: "As more charities employ SMS, higher asks become more common place. We've seen failure rates increase, and with it, support cases rise too."

Typical problems include people misspelling text to donate codes, texting the wrong keyword, or reaching spend caps and running out of credit. At the height of the problem, Cancer Research UK found failed messages were averaging at eight per cent and having a real impact on income.

Spelling fail
So the charity worked with its messaging partner OpenMarket to build more intelligence into its services. It installed a system to detect misspelt keywords and send automated replies explaining the problem. The text asked them to try again and reassured them that no money had been taken. This remedy corrected 20 per cent of failed messages.

The charity applied the same approach to tell a supporter had no more credit or had reached a spend cap – and then gave options on how to rectify it.

Inbound
Another challenge was to apply this intelligence to inbound customer service queries. The charity found that, the more it used its short code to drive engagement, the more people would reply with general questions. Typically, it would reply manually to these messages on a case by case basis. This was time-consuming, and the charity was concerned at sending answers at inopportune times.

However, on investigating the data, it found that three topics accounted for a third of all queries. It's now planning to scan messages for key themes and then send an immediate bounce back SMS that answers the question.

Text: the driver behind the drivers

It takes a huge amount of complex technology to make Uber's transformative service run smoothly. But without reliable text from driver to rider, it all falls down...

What's behind the 'miracle' of Uber? Here's a company built by founder Travis Kalanick on a simple premise: tap a button, get a ride. For millions of people used to waiting ages in the rain for a taxi or struggling to find a mini-cab number to call, it really is a kind of miracle. And they have truly embraced it. Uber launched in 2010 and now has quarterly bookings of more than $5 billion.

Making that magic happen requires lots of processing and hugely complex algorithms. Riders must be matched with drivers, routes plotted, payments allocated and shared. But there's another essential component to the Uber success story that is less talked about. Text messaging.

Real time only
Uber uses SMS to keep riders up-to-date with the status of their request — when a driver accepts, when he or she is less than a minute away, or if the ride has been cancelled for any reason. Clearly, these messages must arrive in real time. When they don't, the whole process falls down. And when Uber launched this happened. A lot.

Kalanick says: "Uber is a pretty seamless experience. It feels like living in the future. You can't have your own private driver without having a great customer experience. And if you're waiting 10 minutes and you haven't been told, there's a problem. And it's crucial for the rider to have that information so he can connect with the driver. Initially, people were not getting the high quality experience that we were promising."

Precious sleep
Uber had built its platform with a hosting provider, but decided to go down a different route. It teamed up with Twilio, which works specifically with app makers, letting them embed voice and text functions directly into their services using software.

Kalanick now says: "I sleep easier, and my engineers sleep easier because we're not dealing with situations where it's taking 15 to 20 minutes for a text to be delivered."

Travis Kalanick, founder of Uber
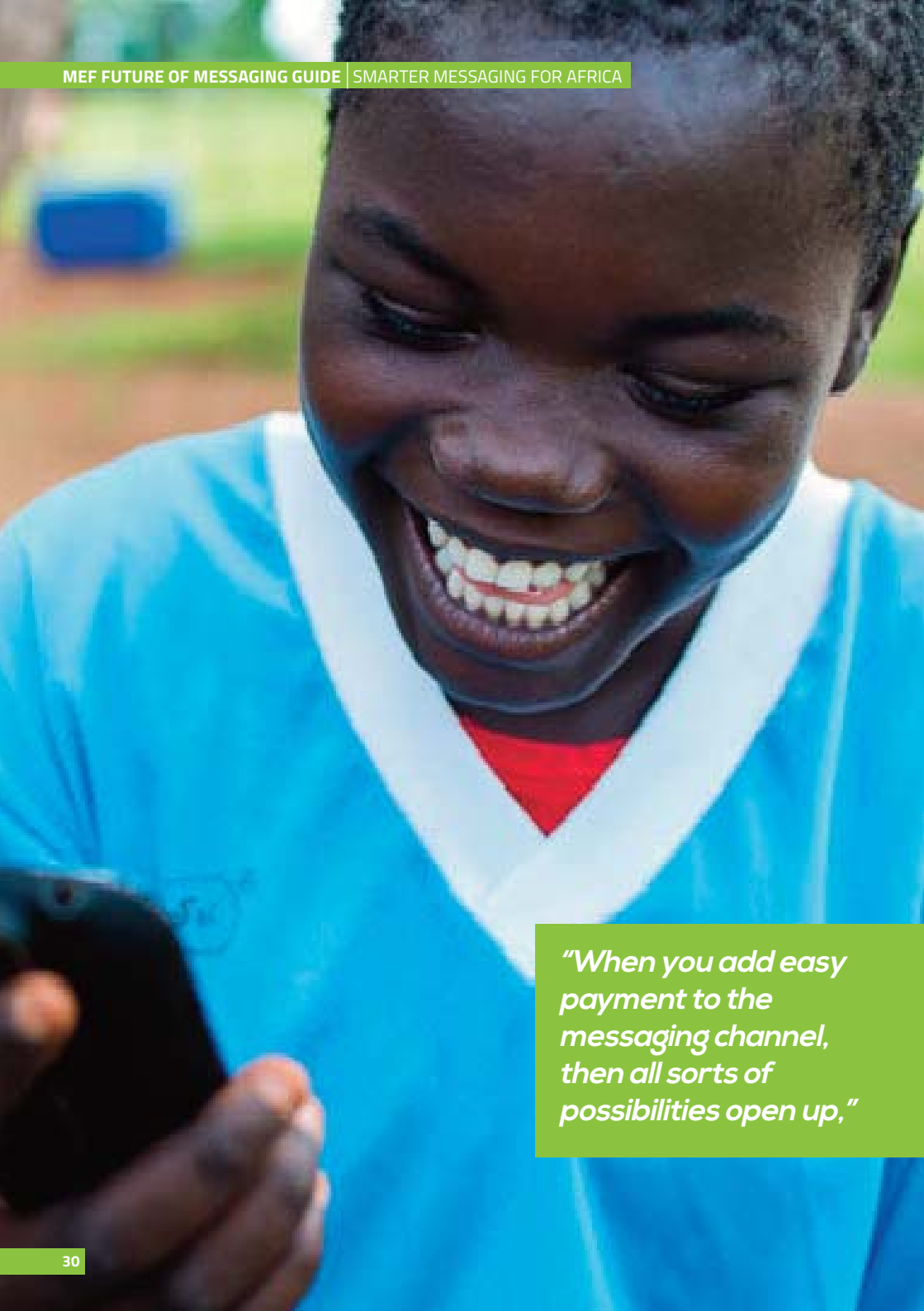
Messaging in Africa: it's for everyone

Are Africa's feature phone users locked out of rich media marketing? Not necessarily. Clever new messaging formats can reach everyone, says **Waheed Adam, chairman of iTouch...**

For all the hype around Africa's smartphone revolution, the stats tell a more nuanced story. Yes, smartphones are on the up. But so are feature phones. Indeed, according to IDC, they're growing faster. It says 23.1 million smartphones were shipped in Africa during Q2 2016 (down 5.2 per cent year-on-year). But shipments of feature phones hit 29.8 million – up 31.9 per cent.

Does this mean millions of feature phone users are lost to marketers, brands, utilities and government? Not necessarily. They may not be able to download apps or content-heavy HTML5 web pages. But there's always messaging. The question is: can messaging ever match the kind of rich experience of a native app?

Rich features
According to South Africa's messaging specialist iTouch, yes it can. iTouch has developed a platform called MEMS (Multi-channel Embedded Message Service) that adds rich media features to a simple text message. A MEMS message contains a URL that points to a unique campaign-specific landing page, which includes content such as video, voice and graphics. It can also be directed to a company's social media links and has an email function that allows the campaign to be sent to a computer if required. All of this will work on an internet-enabled feature phone.

Of course, it is possible to embed a link an an 'ordinary' text message. The difference with MEMS is that each MEMS has a unique URL pointing to each MSISDN making the message personal, private, secure and trackable. It also has interactive capabilities.

Waheed Adam, chairman of iTouch, says this opens up the medium for all manner of use cases. He says: "This means a bank could use it not just for sending marketing alerts, but also offering card or account applications, statements and credit limit updates."

Adam says MEMS is affordable because it's based on the SMS bearer, and brands can create flash-mobisites in minutes for a specific campaign, using existing assets. Results are trackable since each customer receives a unique link. And marketers can send as well as receive messages inside the platform.

Payment inside the message
iTouch says banks are testing the format, which has already been used successfully in Europe and Scandinavia by giant retail brands. And Adam believes the medium can go even further because it supports links to payment gateways. He says the platform can integrate with local processors like PayGate and support in-store mobile channels like SnapScan.

"When you add easy payment to the messaging channel, then all sorts of possibilities open up," he says. "Imagine being able to settle a parking fine immediately. Or pay a TV licence. That's a big issue in South Africa, and yet many people are not paying because of inconvenience more than anything else."

Adam adds that many brands and utilities are trialling MEMS now, but there is the issue of data charges to be resolved. Although a MEMS campaign may only be a few kilobytes in size, this can be a hurdle in Africa, where data remains expensive for most users. Adam admits more work is needed if brands are to make full use of the opportunity. "Data prices will come down," he says, "but in the meantime we need to look at ideas like sender-pays and reverse billing which the MNOs are preparing for."

> **"When you add easy payment to the messaging channel, then all sorts of possibilities open up,"**

Venmo:
turning IOU into 'how are you?'

US-based Venmo is a surprising thing: a social messaging app based around payments. Actually, says **Venmo's head of product Ben Mills**, it's not surprising at all. It was designed that way...

In the US everyone knows about Venmo. In a country that still likes to use cheques, this person-to-person payments app offers a glimpse of the future. Venmo lets people send money to each other instantly. They typically use it to pay for drinks or dinner or rent. And it's become a sensation. In 2015, it processed more than $7.5 billion in transactions. In 2016, it was on course for $20 billion. Venmo has even become a verb, a bit like Google. "I'll Venmo you."

But what's less talked about is that Venmo is also a social network. Its users don't just pay each other small debts, they also use those transactions as the basis for conversations that can be witty, flirty or profane. Who would have thought a payments platform would become a medium for messaging?

The awkward factor
Well, it turns out that Venmo would. The company designed chat into the app from the start. Every exchange – even the private ones – has to include a note. Ben Mills, head of product at Venmo, explains why: "I think we realised that payment is hard, but so is talking about payment. So we wanted to re-frame it so that it was less awkward. By adding in social features, we could make Venmo became more about what you're doing than what you're paying. Ultimately, if you need to pay someone $5, doing it with a note or an emoji makes it less awkward."

This social-by-design strategy was, of course, wildly successful. Users love the emojis in particular, with – unsurprisingly – the pizza icon being the most-used. Venmo regularly updates the function too. In 2015, it added the option to let people autocomplete with an emoji. For example, when someone types 'rent', they can use a pic of a house and a wad of dollars.

Talking with stalking
However, other user habits emerged entirely unplanned. 'Venmo stalking' is a case in point. This describes how some users will visit friends' pages to see and read their transactions. They can find out where they've been and who they've been there with.

"Obviously, this wasn't something we created or even saw coming," says Mills. "But it's a great example of an emergent behaviour – a bit like the hashtag on Twitter – that comes when you create a community."

Of course, the strength of Venmo's social component means that sometimes payment is secondary to the conversation. Mills says it's common for users to pay small sums as a pretext to a message session. "Actually, lots of payments are short conversations. We see lots of $1 transactions that are just an excuse to say thanks or good job."

Messaging makes (business) sense
If Venmo saw embedding chat as a way of removing awkwardness from the platform, it also saw a strong business case for it. Mills says: "Payment is difficult, but ultimately it can be commoditised. That's not the case with social. People go where their friends are, and that makes social media a bigger ecosystem to move into. And once you have a community, you can go in different directions with it."

Those new directions include merchant payments. The aim is to help merchants go where their customers are - i.e. Venmo. And also to pursue the dream of social commerce. "A user might see on Venmo that a friend bought a Beyonce ticket. That could inspire them to buy one too, and it will be easy to do so," says Mills.

> *"By adding in chat, we could make the app became more about what you're doing." than what you're paying."*
> Ben Mills, head of product at Venmo

Just between me and you

Mobile messaging taps into the human desire for contact. But what about the human desire for privacy? **Alan Duric** wants to bring it back. He talks about his privacy-first chat app Wire…

Alan Duric,
CTO, Wire

The success of mobile messaging proves one thing. However fast technology moves, people beings will always want to communicate with other people. Every social network – Facebook, SnapChat, Line, WeChat – just reminds us of this basic human need. But in the rush to embrace these exciting new forms of communication, has another basic human need been overlooked? What happened to privacy? Was Mark Zuckerberg right when he said privacy is 'a social norm that has evolved over time.'?

The makers of the fast-growing messenger platform Wire don't think so. They launched the Wire app in 2014 to bring privacy back to digital conversations. The web site stated: "In the physical world we talk with each other directly. We can lower our voices or close a door to share private thoughts. In the online world we should be able to communicate without passing our private communications through corporate data mines." So the app launched with no ads, no profiling and end-to-end encryption of voice

calling. It then added end-to-end encryption of everything sent over the app – text, pics, video, music. That differentiated the service from competitors such as WhatsApp and Telegram, which offer only some parts their services in encrypted form.

For Wire co-founder and CTO Alan Duric, this is incredibly important. "Most messaging platforms were built for a world that was just about text. But now there's video and music and collaboration and images. And people love to share these assets. So we wanted to make sure absolutely everything is encrypted."

Next stop: IoT
But do people really care? After all, millions seem happy to engage with services that share their data. Duric says: "I see the privacy issue as a little like the passive smoking debate. It's taking a while for people to realise the damage it can do. But attitudes are changing. For the moment, though, security is probably a bigger concern."

Protecting people from the criminals who are increasingly lurking inside message apps is critical, says Duric. And he believes if Wire can make messaging apps safe, it can also do the same for the IoT where the threat is arguably even greater.

He says: "We're already reading about hackers intercepting baby monitors. And about widespread ransomware. But imagine the ransoms they could demand if they took control of your car?" So this is where Wire will go next. In 2016 Wire open sourced its encryption protocol and its mobile, desktop and web apps. The next step is to open up the API so third parties can build their own secure services on top.

Road safety
Duric says: "Data in the cloud will always be prone to attacks. So the only way to really protect the IoT is to ensure the data at the end points is properly encrypted. That's what Wire can do."

Thus, a platform originally designed to make it safe and private to talk to your friends could end up securing the way a car 'talks' to its manufacturer. "In the future a car is going to be like an iPhone. It will have so many connected components and occasionally it will need a software update. Our platform will help companies like car manufacturers build security into these updates."

> **"I see the privacy issue as a little like the passive smoking debate. It's taking a while for people to realise the damage it can do. But attitudes are changing."**

WeChat's African adventure

WeChat has already conquered China. Can it do the same in South Africa?. **Brett Loubser, CEO of WeChat** . talks about rising to the challenge...

Fans of South African radio DJ Gareth Cliff have an interesting way of engaging with their favourite shock jock. Basically, they can 'add' him. In 2014, Cliff decided to do something different with his popular show Cliff Central. He was frustrated with broadcasting rules that limited what he could say. And he was exasperated that he couldn't engage more directly with his listeners. So he migrated the show over to WeChat.

Today, WeChat users in South Africa can go to 'add contacts', find 'official accounts', type in CliffCentral and add the show. Thereafter, they just tap 'listen' to take part in the fun.
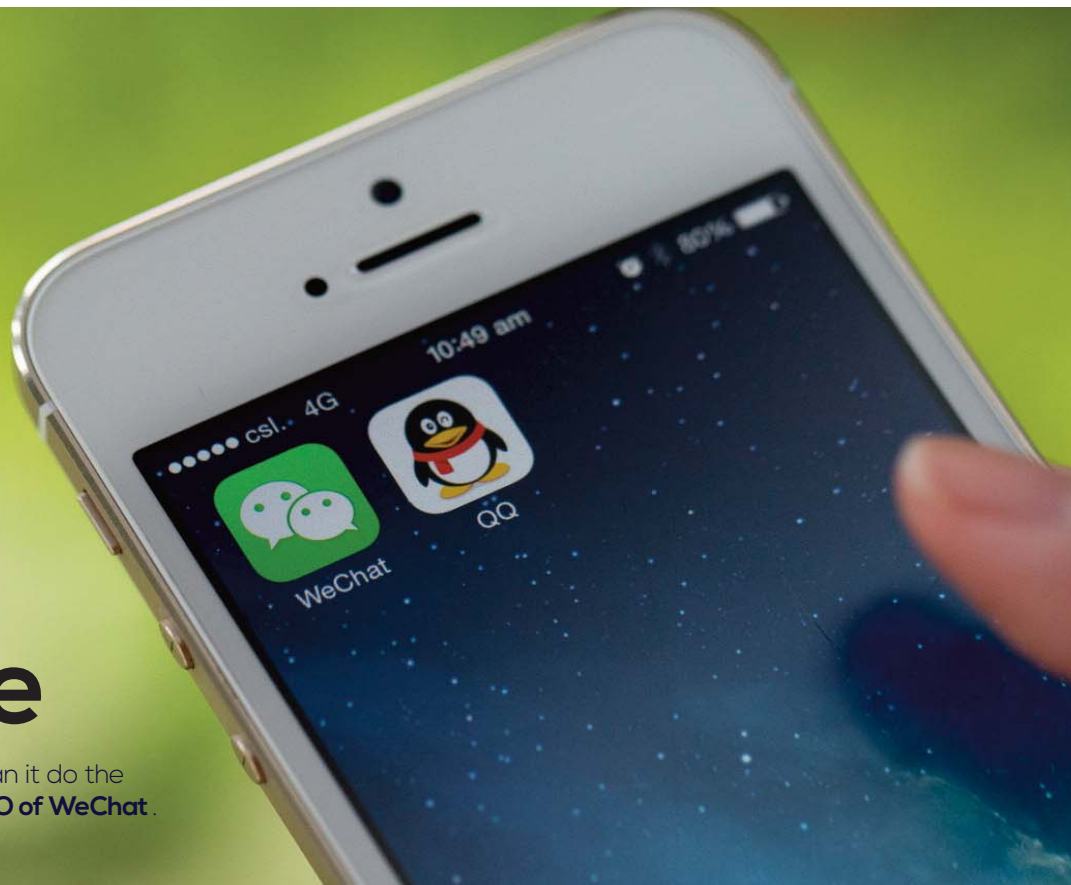
Of course, it is also possible for fans to listen to the show online and debate it on Twitter et al. The difference with WeChat is that the whole experience happens inside one app. In 12 months, CliffCentral amassed more than 131,000 followers this way.

Fraction of the cost
For Brett Loubser, CEO of WeChat Africa, CliffCentral illustrates the most compelling benefit of WeChat. It's not an app. It's a platform. He says: "Cliff has effectively built a fully digital radio station: the perfect showcase for him. But he's done it for a fraction of the cost and time he would have spent developing an app. In fact, it was five weeks from first meeting to going live."

CliffCentral is helping CliffCentral popularise an app that has, of course, come to dominate China. There, the app is so popular it effectively substitutes for the internet itself. Over 700 million people use it to look at maps, order taxis, pay bills, find dates, get loans, play games and more. It has more than 10 million third party apps.

Strong tradition
Needless to say, WeChat South Africa has fewer. But Loubser is working hard to change that. He has faith he can. WeChat Africa has powerful backers. It is a joint venture between Chinese owner Tencent and South Africa's media giant, Naspers. And there's a strong tradition of social messaging in South Africa, which had its own homegrown chat app, MXit, long before most other countries (MXit closed in 2016).

Though WeChat faces strong competition from WhatsApp, Loubser believes its platform qualities can help it succeed. He says: "App development is expensive and developers are hard to find. Our job is to show startups that they can get a service live extremely fast and they don't have to worry about payments or location and so on. It's all baked in. Adding any new feature is just adding an API. It's many times cheaper and many times faster than building an app."

Reducing the payload
And there are similar benefits for end users. "There's a certain amount of payload if you want to download an app," adds Loubser. "There's the data cost and finding space on the phone. It's all much simpler inside WeChat."

To encourage startups to try the platform, WeChat announced a 50 million rand ($3.5 million) seed fund, which backed micro-jobbing service M4Jam (Money for Jam) and delivery service Picup among others. It also teamed up with Standard Bank to create WeChat Wallet. Users can connect their debit and credit cards to it, and withdraw cash at ATMs by entering a code.

Bank to the future
Standard Bank also uses WeChat to offer 'always on banking'. Users can message an agent at any time and receive a response inside the app. Loubser says this asynchronous experience works for both sides. "It's so much better than IVR and being on hold with elevator music," he says. "Psychologically people don't mind waiting for a response, even if it takes an hour, as long as they feel in control. And the system lets agents manage multiple queries at once, so it's more efficient."

Brett Loubser, CEO of WeChat Africa

03

MACHINE MESSAGING:

The future of mobile messaging may well be post-human.

First, there are the bots - virtual 'people' you can chat with to organise your expenses, learn languages or catch up on the news.

Then there are smart machines that relay performance information back to their makers, or to other machines, by text.

In this section, we highlight the pioneers in this exciting new phase.

Switching on the machine future

A new breed of connected machines will need a new kind of SIM when they talk to each other, says **Robert Gerstmann, MD of the enterprise division at CLX Communications**…

Robert Gerstmann, MD, enterprise division, CLX Communications

What happens when you sell a connected car overseas? Which operator does it connect to so that the driver is able to call, message and access value added services from its dashboard? With phones it's easy: the user just inserts his or her SIM. That's not perfect for cars. And it's even less practical for meters or lighting or any of the other promised smart devices of the future.

CLX Networks is determined to solve this problem. How? With a new breed of SIM cards that can connect to – and dynamically switch between – multiple operators. It is currently in beta with 10 clients. The product is built to make real the promise of the Internet of Things: to make previously dumb devices smart. What makes the move remarkable is that CLX is barely eight years old. Today, CLX is NASDAQ-listed and employs 300 people.

Cloudy prospects
Though it launched as an aggregator of A2P (application to person) messages, CLX's plan was never to just get better at delivering text campaigns for enterprises. Instead, it became a provider of cloud-based communication services. That led the company to the forefront of a revolution that's putting connectivity inside machines.

Robert Gerstmann, MD of the Enterprise division of CLX Communications, explains: "It's a very significant opportunity. Analysts are now forecasting 2.5 billion cellular IoT connections by 2024. Obviously, smart devices will need a different kind of connectivity to people. For example, I recently heard about a transport company with thousands of connected payment devices. It wanted to switch operators but couldn't because switching involved getting engineers to manually swap out all the SIMs. Having a dynamic SIM can solve that problem."

SIMple
There are many more use cases, of course. The system works well for companies whose products might be sold overseas or used by consumers on foreign soil. The alternative – keeping track on where each device is sold and fitting it with a local SIM – is clearly untenable. However, this does challenge CLX to ensure its dynamic SIMs can easily connect to multiple MNOs. Gerstmann says: "We're working to create a global connectivity service for the IoT market on one SIM card. Clients just

pay for their actual usage instead of a traditional subscription model with fixed monthly fees. And there's no need for the client to have individual SIM cards and agreements in every country themselves."

Gerstmann admits that operators differ in their openness to the idea. But he says it just reminds him of the early days of A2P SMS, when some carriers wanted to sell direct and not work with intermediaries. However, CLX triumphed in that market by anticipating trends and building its own platforms. Significantly, it bought Symsoft and its SMSC (short message service centre). That became the basis of the company's messaging platform and gave CLX the ability to leapfrog most others in the market, who tended to have older legacy systems.

Profitable
"The fact that the SMSC was being licensed to other customers meant that the platform became – and still is – a profit centre for us, while everyone else in A2P has their platform as a cost centre. Meanwhile we focused on one thing: the operational cost of every transaction," says Gerstmann.

CLX has kept growing without taking any external funding. And its status as a market leader was proved when, in May 2016, it bought 100 per cent of the shares in Mblox, arguably the creator of the A2P market. The move instantly gave the Swedish firm valuable new relationships, technical capabilities and a big bump in scale.

Now, CLX is ready to capitalise on the steady growth in A2P traffic while pursuing the IoT market. "I believe A2P messaging will continue to grow between 10 and 20 per cent per year depending on country," says Gerstmann. In the industries where it's being used, there are still so many companies that don't use it. And in emerging markets rising subscriber penetration is still driving growth. In addition I'm certain there are many more use cases that no one's thought about, so the market is there."

> **"Smart devices will need a different kind of connectivity to people."**

You have a new message (from an oil rig)

Heavy industry might be the next big user of mobile messaging, says **Sethu Meenakshisundaram, president of SAP Mobile Services**. He talks about the promise of smart connected machines...

Sethu Meenakshisundaram has a vision for mobile messaging. And it's not necessarily human. He is qualified to opine on the subject. He was a director at messaging pioneer Sybase for 15 years and today he is president of SAP Mobile Services (a division of SAP), which bought Sybase in 2010. He's seen messaging evolve from a person to person medium to a channel through which enterprises can communicate with customers. The next stage, he insists, is all about machines.

Supply chain reaction
He says: "There will always be human interaction, whether it's through SMS or chat apps. But the big opportunity as I see it lies with bringing connectivity into fields like supply chain, diagnostics and field management. We call it 'intelligent interconnect through messaging'."

Verticals on the up
This sounds like the Internet of Things. And in a way it is. It's all about connecting remote and previously dumb devices to other devices and to their human custodians. But Meenakshisundaram is not concerned with consumer use cases like smart toasters. His focus is on bringing connectivity to verticals such as oil and gas, automotive, industrial tools and so on.

He says: "SAP started in manufacturing. It's still number one in transport, logistics, supply chain. This is a great opportunity to add value and bring new efficiencies to some of our biggest and oldest customers. They can use our solutions to find out how their machines are functioning at any time, and do it all from one central location."

Out to sea
Importantly, thanks to the core strengths of SAP Mobile Services, this connectivity goes through the SMS channel. Meenakshisundaram says this is safe and promises unrivalled reach.

"We have customers who have equipment that's 600 miles out to sea. There's no wifi. No cable. So we provide them with SMS connectivity. But the important part is that they don't know it as SMS. We put it inside a beautiful wrapper that's much more relevant to want they're doing," he says.

Cellular and universal
Another critical component of the SAP Mobile Services proposition is its ability to offer universal cellular connections, no matter where the device ends up. "It's funny. No one really thinks about the reality of connectivity," he says.

"They want to put a diagnostic solution inside expensive and important devices. But they don't think about how it will connect to different operators around the world. We solve that with global SIMs. It means that, for the manufacturer, they can use the same part number wherever a machine goes."

Pull here
Using SMS also brings with it a greater level of security. In these early days of the IoT most devices are connected over IP. That has led to numerous, regrettable hacking scares. The SAP Mobile Services solution runs over a private and secure SS7 channel. What's more, in most cases, the devices are not actively sending data back to base. Instead, the data is pulled by the monitoring organisation.

Meenakshisundaram explains: "It's very important that these solutions are extensible and programmable. We build them so that the customer has control over when the data is sent, and who pulls it. The devices are never permanently connected. They're essentially in sleep mode, which also extends battery life over several years."

Sethu Meenakshisundaram, president of SAP Mobile Services

Chatified accountant

Three quarters of small businesses use Excel or even paper to manage their accounts. Now, they can chat to a bot called Pegg. **Kriti Sharma, VP of bots and AI at Sage,** explains why the accountancy software specialist created him...

Kriti Sharma, VP of bots and AI, Sage

Every day, millions of small to medium sized business use specialist accounting software to manage their finances, organise payroll and log expenses. Three million of them use Sage, one of the most popular packages available. And the rest? An excel spreadsheet. Or, failing that, a big old shoe box filled with scribbled notes and receipts.

These users could be viewed as a business opportunity for a company like Sage, which estimates 65 per cent of all businesses use these 'analogue' methods. But the truth is, most of the shoe box brigade are turned off by accounting software, no matter how affordable and intuitive. They would rather ignore it and do more enjoyable things – like chat on Facebook Messenger. However, these entrepreneurs do need to manage their accounts. So what's the answer? For Sage, it is simple: make accounts something you can do by chatting.

British accounting humour
In July 2016 Sage launched Pegg, a chat bot that lets small business owners enter and track information such as money owed, account balances, expenses

and more. Customers simply add Pegg inside Slack or Facebook Messenger (or use it inside the existing Sage software) and then ask it questions in natural conversation. They could ask 'who owes me money?' or 'how much did I spend on coffee in April' or 'what did I earn last month?' and Pegg will deliver the answers in real time and without jargon. Indeed, Pegg even uses what has been described as 'British accounting humour'. Ask Pegg what it's doing, and it will reply: "Daydreaming about purchase ledgers."

Non-threatening
For Kriti Sharma, VP of bots and artificial intelligence at Sage, Pegg is all about giving people a non-threatening way in to personal accounting. "Let's be honest, accounting is nobody's favourite task," she says. "It's a pain point for most people. And for them the traditional interfaces are not working. We looked at the market and saw how popular messaging apps have become. People love live chat. So it became obvious that chat was the best interface to reach them."

From the start, Sharma and her team were careful to position Pegg not as a chatbot for accounting, but

more of a personal assistant. Hence the non-threatening name. And by putting Pegg inside Slack or Facebook Messenger, it removed further barriers to adoption. She says: "Pegg is free, and there's no login or registration. You just add it to your contacts and start talking. The best feedback we've had has been from users who said they felt that accounting had become invisible. They were just chatting."

Personal accountancy training
Today, Pegg has users in 85 countries (though available only in English). And it's evolving. For example, following feedback from users, Sage added emojis shortly after launch. Sharma says she wants to see Pegg grow from being a tool to a genuine 'personal trainer' that actively assists users in accounting matters. She says: "The more you use Pegg the more it can understand your behaviour, automate tasks and start to make suggestions. It's a bit like a fitness tracker. You might start by just looking at the data, but in time you can quantify your performance." Sharma believes Pegg represents more than just an alternative to more formal ways to manage accounts. She insists it can actually help new

businesses survive. According to Sage data, around 400,000 businesses launch in the UK alone every year, but half close within the first few years.

The basics
Sharma believes the administrative burden is a key factor in why they fail. Meanwhile, in developing markets, there's an even more basic need for some kind of digital accounts management. She says: "No one starts a business to file expenses and do tax returns. But these things need to be done. Pegg addresses this – especially in new markets where mobile is the main channel for people."

Gina Gotthilf, VP of growth at Duolingo

> *"Talking to a bot isn't awkward . It's fully in your control and provides a way to practice conversation without the fear of sounding unintelligent."*

The bots that say
Ja, Si and Oui

Every day Duolingo helps 150 million people learn languages for free. But until recently, says **Duolingo's Gina Gittholf**, learners couldn't practice conversation. Now, they can – thanks to message bots...

The mere idea of a chat bot is hard for many people to understand. But one that speaks in a foreign language? Surely that's just a step too far. Not for the makers of language-learning app Duolingo. For them, friendly bots like Chef Roberto (the pizza maker) and Renée the driver have solved a huge problem: how to get people talking in a new language without self-consciousness.

Duolingo is a free app that helps people learn foreign languages through memory puzzles. Users can earn virtual currency called Lingots, which they can spend on extras. There's also a progress bar on top that expands or shrinks to reflect performance. Learners can also compare their progress with that of their friends. Essentially it employs the techniques of video games to make learning and retaining information fun.

The chat gap
The fact that it works – and that it's free – has helped Duolingo gather 150 million users. But for all its progress, Duolingo had a sticking point: users couldn't chat. Gina Gotthilf, VP of growth at Duolingo, explains: "One of the main reasons people learn languages is to have conversations in that language. They want to travel and have a more authentic experience, make friends, get a job or communicate with family. Yet the way we learn languages – memorising vocabulary and learning grammar rules – is very different from coming up with things to say in real-time."

The obvious solution was to pair, say, a German learning Italian with an Italian learning German. But when Duolingo tried this it found that people were too embarrassed for it to be effective. The gap in ability between the two was too great. "Speaking a language and being able to help someone else, or teach it, are very different things," says Gotthilf. "Also,

it's awkward speaking with strangers on camera, especially in a language you don't really know."

Then came Roberto and the other bots. They solve the problems arising from human encounters. In a chat session, they text simple questions that demand obvious answers. Tricky words are highlighted (users can click to see translations) and there's an autocomplete function that kicks in when learners are using the correct word. Chat sessions are short.

End of awkward
Gina Gotthilf says: "Talking to a bot isn't awkward or daunting at all. It's an experience that's fully in your control and provides a way to practice conversation privately, without the fear of sounding unintelligent. They also actively help you respond when you're stuck, teach you different ways to respond to different situations, and let you think before you have to reply instead of demanding an immediate reaction."

Interestingly, these teacher-bots don't seem to be affected by the usual shortcomings of AI chat. In a customer care scenario, for example, bots can misconstrue a question or its nuance. But here, the nature of the conversation is limited and basic. And, indeed, it's the bot that's teaching the human.

For now bots are available for English speakers learning Spanish, French and German, but more options are coming soon. Even more significantly, Duolingo will add voice recognition so that learners can talk to the bots.

¿Qué quieres beber?
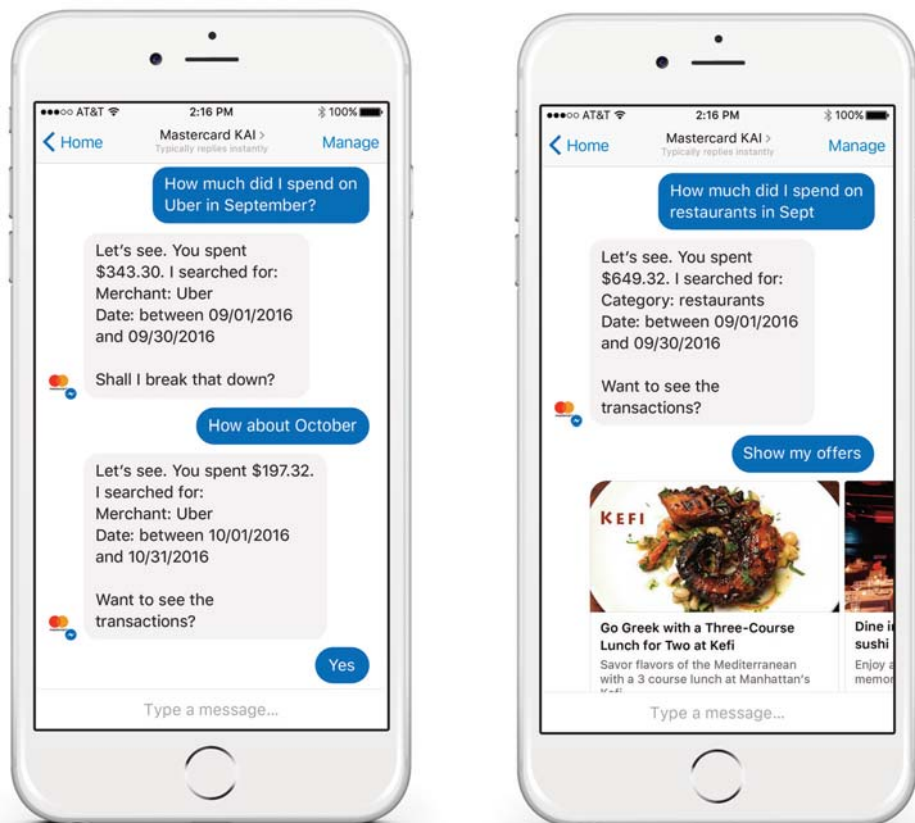
How can AI be of assistance?

After years of self-service digital banking, the personal assistant is making a comeback. But this time the helpful agent is a bot.
Kiki Del Valle, Sr VP for Commerce for Every Device at Mastercard, looks ahead to a revolution in financial management...

For decades consumer banking worked the same way. Account holders would walk into a building and tell cashiers what they wanted. On the plus side, it was nice to talk to a human. On the minus side, it could be a huge time killer. So many hours spent travelling to the branch, queuing at the branch and waiting for the instructions to actually take effect.

Digital wiped out the waiting. Banking went from the branch to the pocket. A balance inquiry would take seconds. A transfer could be carried out in minutes. Great. But something was lost in the transition. Digital made financial management a self-service affair. People had to master passwords, PINs, menus and icons. For many, this was confusing and impersonal.

Best of bot worlds
Now, a third way is coming, which combines the speed and convenience of digital with a welcome personal touch: banking by bot. The innovation lets people chat with artificially intelligent agents inside a messenger app. Once they have linked their accounts to their messenger ID, the bot can answer all manner of questions. And for the account holder, it feels as natural as texting a friend.

Mastercard is at the forefront of this change. It unveiled Facebook Messenger bot pilots for issuer banks and merchants in October 2016. Eventually, it will roll them out to Messenger's one billion users. And the company also has plans to develop bots for other chat apps as well as SMS.

Kiki Del Valle, SVP of Commerce for Every Device at Mastercard, says: "Our starting point is that customers should pay how they want – and that we need to go where they are. At the moment, they love messaging apps. And these apps are all preparing to support payments and shopping. We need to be ready for this." Once a user has selected the Mastercard assistant from the bot menu and linked an account, he or she can ask questions about spending, review purchase history, make transfers, monitor spending levels, set up alerts and more.

Layers of detail
The interactions can be very detailed. Del Valle says:

Kiki Del Valle, SVP, Commerce for Every Device, Mastercard

"You can ask the bot how much you have spent in restaurants in the last three months. You could then set a cap on spending and an alert for when you near the limit. It's so much quicker and more efficient when you do this in a natural language chat session."

However, the bots don't just make interactions more intuitive. They also help both Mastercard and its issuing partners to showcase products and services. Del Valle says: "We can look at the questions people ask to determine how our partners could do things more efficiently and make the most of business opportunities. And in the case of Mastercard we can use the bots to tell people about purchase protection, fraud alerts or contextual offers."

Shop a lot by bot
Alongside developing its own bots, Mastercard has built a Bot Commerce API that merchants can embed inside their bots to make buying with Mastercard a seamless experience. The idea is that consumers will shop on chat platforms and check out with the Masterpass digital wallet.

"It's a safe transaction experience that takes just one click," says Del Valle. "And it can all happen without the customer having to leave the chat session and go to another payment screen on a web site. We think this could very important to merchants as commerce moves inside messenger apps."

The news follows **this message**

Can you have a conversation with the news? Digital newspaper Quartz thinks so. Its app dispenses with the usual menus and lists. Instead, it lets readers browse the day's headlines in a chat interface. **Zach Seward, Quartz's senior VP or product and executive editor**, explains the thinking behind a left-field idea...

Zach Seward, senior VP of product and executive editor, Quartz

It's a truism in tech that when a medium embraces innovation, it takes a while for old norms to disappear. It's why the first movies looked like filmed stage plays and mobile phones had qwerty keyboards. In a similar vein, online newspapers tended to look back at their paper editions for inspiration. They wrote digital news stories to the same length and style as before. And they presented in sections – politics, sport, weather – in the expectation that readers would browse them as they did the morning edition.

But newer 'digital native' entrants have torn up the rulebook to think differently about how we consume the news. They include US-based Quartz, which launched in 2012 to publish 'intelligent journalism, built primarily for tablets and mobile phones.' It currently has around 19 million unique monthly visitors.

News as API
In 2015, Quartz dared to ask: can we have a conversation with the news? Its app, which launched in February 2016, lets readers discover stories in a chat format. The bot presents a story to which they can tap a caption for more or 'anything else' to move on. The experience is enlivened with gifs, videos and emojis.

According to Zach Seward, Quartz's senior VP of product and executive editor, the app is the result of a mission to find out what it would look like if "journalism was truly made for peoples' phones." Indeed, Seward even likens Quartz to an API that can go anywhere its readers are, in whatever form is appropriate.

Thus, Quartz has a desktop site, a mobile site and an email daily brief. But for four years, it didn't have a native app. Truth is, it just didn't like them. "We weren't keen on native apps for news. And we still feel that way," says Seward. "Its one thing to make the web work well on mobile, but another to build a truly native mobile experience. We considered building an experience entirely around notifications, but that raises the question: then what?"

The right tone
And so Quartz began thinking about a conversational interface. If millions of people were communicating this way with their friends, why not the news? The team started building. It designed the UI to be an almost identical replica of the iPhone's stock messaging app.

But it soon became clear something was wrong. Seward says: "When we prototyped it, we were using existing copy from the site and it felt lifeless. We obviously need to write specifically for the format to get that conversational tone right." This is important because all the content in the app is written by staffers. It's only the users' interactions that are controlled by bots.

Admittedly limited
The Quartz app presents around 20 stories a day. Obviously, this is much more limited than a regular news app with menus and lists. But that's the point, says Seward. "The app is not especially efficient in the classical sense. You can scan a list if you want a broad view of the news. That's not our goal: we want to be informative and entertaining."

For this reason perhaps, the app has divided readers sharply. Some hate it. Others adore it. Quartz initially expected readers to open the app once a day, but found most open it twice a day and spend between four and five minutes with it.

Office chat
Slack bots make work smarter

When Slack introduced bots to its workplace comms tool, they were an instant hit. **James Sherrett, senior manager of accounts for Slack EMEA**, explains why...

Slack's corporate motto is 'be less busy'. The messaging company has found huge success making workplace communication easier for its four million users. Its own stats say deploying Slack leads to 49 per cent less email use and 25 per cent fewer meetings. This is partly because someone else is doing so much of the work. More accurately, some *thing* else. Bots.

Today, there's a Slack bot for pretty much everything. Most bots exist to automate menial tasks. Birdie, for example, will take away the pain of managing and preparing expenses. Workers send it private messages with amounts, and upload scans of receipts. The bot (called Bill of course) will organise everything inside a Google Drive spreadsheet. Meanwhile Howdy is a bot for team management. It can be programmed to ask questions such as 'what are you working on?' to designated colleagues, then collate and distribute updates.

Humanoid
And to make the UI easy, Slack even gives bots 'human' qualities. They get their own profile pics, names and bios. And they sit inside the team directory, where they can be messaged like any colleague. James Sherrett, senior manager of accounts for Slack EMEA, says: "A simple way to think about bots is in terms of email. There are four kinds of email. There's spam. There's someone asking you for information. There's someone giving you information or sharing a file. And there's a service giving you a notification like 'you have a new follower.' When you're inside Slack, bots do the last one."

The time-saving ability of Slack bots helps to explain the meteoric rise of the company since it launched in 2014. Slack succeeded because it recognised that messaging in the workplace was broken. And it did so almost by accident. The firm started out as a game developer and was so frustrated by email that it built its own in-house messaging tool. In time, the founders realised they had built something special. But it wasn't the game product. It was the messaging tool. Sherrett says: "When the game closed, the team all said they never wanted to work in an organisation without the messaging system, so they pivoted. And when 8,000 companies signed up for a trial inside 24 hours, it was clear they were on to something."

Inbox imprisoned
Slack's early research revealed that while a small number of its clients switched to Slack from other specialist workplace tools, the vast majority were using a mishmash of email, apps and (probably) shouting. Sherrett says: "The situation was so bad. Take email. It works for external comms, but within the company it's mostly terrible. All the value is locked up inside people's own inboxes."

So Slack devised features designed for the reality of teamwork. Users can chat one-on-one or in groups. They can upload and share files, and they can do so across multiple devices including mobile. Crucially, Slack also integrates with other apps and services such as Skype or Dropbox or even Uber. There are 625 such apps now. And to make it even easier to communicate with them Slack introduced bots. Essentially, bots let users talk (via a chat session) to their favourite services inside Slack. No need to open a separate app or worry about drop-downs menus.

Hard-working Slackbots may be making it easier for employees to do their jobs, but they're not all work. There are bots for Poker, Ping Pong and even Connect 4. Something to do when you're less busy.
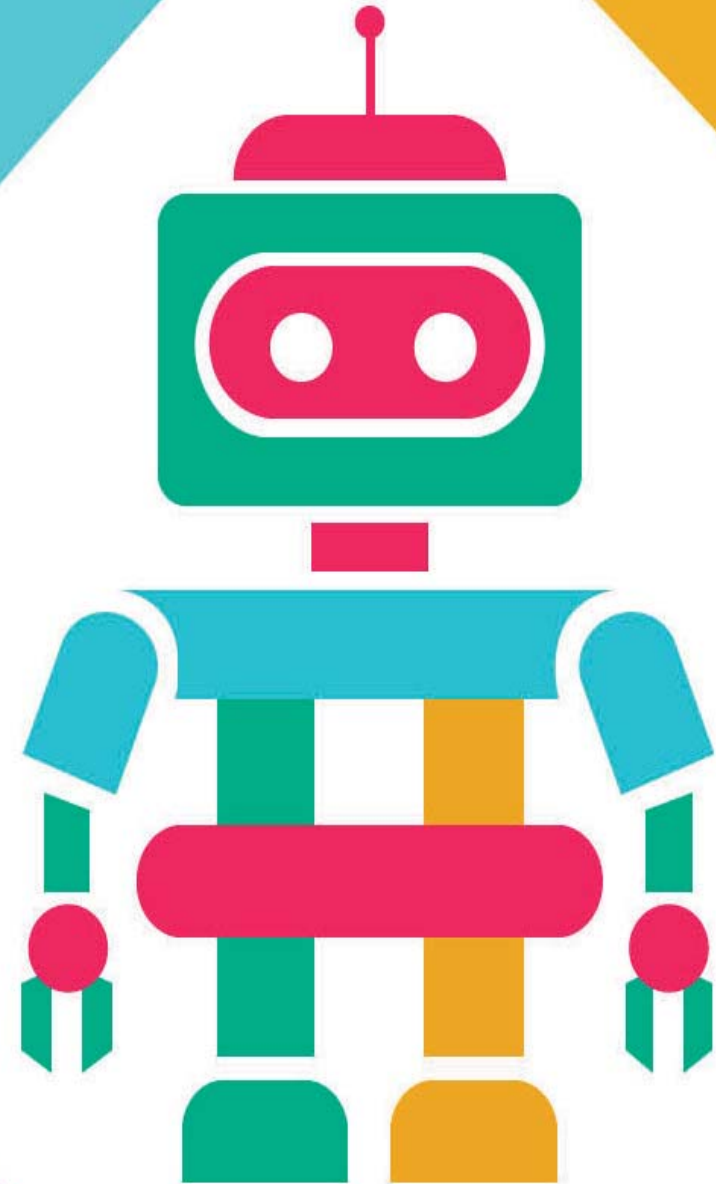
"Bots let users talk to their favourite services inside Slack. No need to open a separate app or worry about drop-down menus."

James Sherrett, senior manager of accounts for Slack EMEA

04
WHAT'S NEXT...

What part will messaging play in our digital lives? Is it possible that messaging will replace apps and web pages?

What are the prospects for 'conversational commerce'? Could chat be the medium in which we shop online?

And how will people send messages in a post-screen future of wearables and AI?

In this section, we explore where next for the medium itself.

Platform three?

First people lived their digital lives inside web pages. Then came the app. Could messaging products be next? **Benedict Evans, partner at Andreessen Horowitz,** has been considering the question...

Benedict Evans has become mildly famous in mobile circles for his astute observations about technology trends. The partner at VC Andreessen Horowitz has made plenty of insightful statements. But few are quoted more than this one: "Old: all software expands until it includes messaging. New: all messaging expands until it includes software."

In other words, messaging services are where people go not just to chat, but to find information, look at maps, buy stuff. Clearly, they're doing that already in WeChat, Line, Viber and the rest. The question is: do users need to go anywhere else? To quote another Evans' blog entry: "Can messaging become the third runtime on the phone, after the web and native apps?"

Evans believes the reason why messaging has acquired such significance now is due to the nature of the smartphone itself. After all, people could use MSN and Skype on the PC, but these services never achieved any strategic dominance. He says "For two decades we had the monolith of mouse, keyboard and web with Google layered on top. But mobile has disrupted all that. In fact, the smartphone itself has become a social platform."

He says this is because every app can access your address book and photo library, so adding a new app is painless. Also, the phone number itself acts as a unique social identifier which makes it easy to find (and trust) your contacts. The ease with which people can try new messaging services (and quickly add friends) has led to an explosion of apps. And there have been huge successes such as SnapChat, Kik, Instagram, Facebook Messenger and WhatsApp.

Behavioural change
The challenge for new entrants is to find a new behaviour that can make their offering go viral. Some have done it – Snapchat most obviously – while others, like Whisper and Secret, could not sustain interest.

Now, argues Evans, the question for messaging giants like Facebook is whether they can take the next step and become platforms. The reason this is appealing is because it offers a way to overcome the closed nature of the phone. Evans explains: "If you want to distribute apps. You can't. There's no systematic way to distribute apps outside of an app store. If you don't own the OS, you're locked out. It's a big strategic problem."

In Asia, the messaging app has become a container for web apps. As a result, users can do everything inside them – shopping, banking, gaming and so on. And this has turned services like WeChat into miniature versions of the web itself. In the West, Facebook is doing its best to become a destination for brands' notifications. Websites can send messages like 'your item has been dispatched' directly into Messenger, if the user logged into that website with Facebook when ordering.

Conversational
And then there are the chat bots. Evans can see the logic of 'chatting' with a brand. He says: "A company like Amazon could send a notification to a user by email or via Facebook Messenger, and the customer would probably find FM better. It's easier to reply to that message and start a conversation. It feels like SMS."

But he believes the fundamental problem with bots lies with the limitations of their NLP (neuro-linguistic programming). "In an e-commerce transaction, bots might work well," he says. "There are a limited number of things you're likely to ask: when is my package being delivered, for example. NLP will guess that, and there's

always a user agent to fall back on. But a CNN bot? How easy would it be for a user to break it? That's harder to predict. That said, when bots do work, they become very interesting, particularly because they get around the app-installation problem."

Benedict Evans, partner at Andreessen Horowitz

The power of the **network**

The operator SIM is a treasure trove of information about a subscriber. Now, **Telefonica** is using this insight to make messaging even smarter...

A mobile operator knows a lot about its customers just by analysing their behaviour on the network. Some of this is obvious – location, browsing habits and so on. But it's been revealed that operators can even tell when people are bored. In 2015, researchers at Telefonica developed an algorithm to reveal boredom. In a project called "When Attention is not Scarce - Detecting Boredom from Mobile Usage", they looked at the time duration since the subscriber last had a call or text, the time of day, and even things like scrolling. A series of speedy swipes through a Facebook page was indicative of restlessness, for example.

The researchers concluded that this algorithm could predict boredom up to 83 per cent of the time. They tested this by sending users a link to an article on BuzzFeed. They found that more people clicked through from a 'bored' sample than a control group.

So what? Well, Telefonica is now considering how to build this functionality into an wider offering for its enterprise customers. In theory any brand could send existing customers a well-timed alert at periods of 'peak boredom' for better engagement.

For Telefonica, this is just one quirky example of a drive to make more of its network assets – and thereby give more value back to corporate messaging users.

Indeed, in late 2016 it launched LUCA, a dedicated Big Data services unit, just for this purpose. "Data is a critical asset for the future of Telefónica... and we want to help our clients understand its full potential," said Chema Alonso, chief data officer of Telefónica. "We strongly believe it will help our clients in decision making, more efficient resource management and in returning the benefits of this wealth of information not only to their clients and direct users, but also to society."

Crime stopper
Relieving boredom may be at the lighter end of big data problem solving. But elsewhere, Telefonica is already tackling much more serious issues such as combating crime. In fact it is already using its data assets in the UK and Peru to help banks detect fraudulent activity.

The platform uses network usage data to help banks verify they are sending messages with sensitive financial content to the right person at the right time.

Using these insights, Telefonica can disclose if that request has come from a recently acquired SIM, for example, which may indicate criminality.

When in roam
Similarly, Telefonica can detect when a phone is overseas and alert the bank. This means it will not be necessary for the customer to make a call to have purchases approved. "The challenge for financial institutions is to avoid scams and frauds in the use of credit cards, both in the physical and virtual worlds. The goal is to provide the customer with a secure, seamless and integrated experience," says Ethel Bazán, manager of Big Data at Telefónica Grandes Empresas.

Wider verticals
In time, Telefonica will apply its network insights to messaging across other verticals. It believes the idea has applications in insurance, marketing and healthcare and could help with services like travel alerts and credit scoring. Naturally, all activity will require user consent.

Interesting that this big data push by Telefonica centres on a decades-old medium like SMS. But as has been

James Lasbrey, global head of messaging, Telefónica

said many times before, text is universal and doesn't require data access. Typically, 90 per cent of texts are read in minutes.

Inflexion
Indeed, Telefonica says the market for enterprise SMS has doubled in the last two years. It believes its plans to use of network insight will accelerate this growth.

James Lasbrey, global head of messaging at Telefónica, says: "We're hitting an inflexion point now in terms of on-to-many business messaging. The potential is huge, and with the addition of big data to make messages more targeted and smart, I think we'll see some fantastic new use cases very soon."

An OTT that's just for me

What if every brand could have their own in-app messaging channel rather than rely on WhatsApp and Facebook Messenger? Layer says they can…

Layer's in-app messaging has worked well for the digital personal stylist Trunk Club

I n the last few years, it's become very easy for developers to build previously complex services into their apps with as few lines of code. Payments? Don't worry about all those issuers and processors. Just use Stripe. Location? Just add the Google Maps API. But what about group messaging? Should app makers just accept the need to set up WhatsApp accounts and meet customers there?

Layer doesn't think so. In 2013, it launched a platform to let developers easily create their own rich messaging services inside their own apps. These services do everything that Facebook Messenger, Kik et al can do: one-on-one and group chats, syncing across devices, push notifications, gifs, read receipts, etc. But they allow brands to control the whole process while keeping customers inside their apps. Layer now has 400 customers.

Ron Palmeri, CEO of Layer, says he founded the company when he began to realise the strategic importance of one-to-one conversation. "There's a pattern that always seems to emerge. A service becomes successful and a community dynamic grows around it. Soon these small and focused communities become important and you don't want to lose them. It's why YouTube recently let visitors have one to one chat inside the site. YouTube

obviously saw people leaving the site to have these conversations, and they couldn't afford to let that happen." Palmeri has also observed the trust 'dividend' of having rich customer communications. He says: "Brands are finding that great interaction leads to more trust, which ultimately leads to more transactions. AirBnB, for example, has said that host ratings depend as much on the quality of the interaction as the accommodation itself."

Trunk calling
Then, of course, there's the fact that people respond to mobile messaging faster than to email. And they often prefer it to voice too. Palmeri cites an example of this from its customer Trunk Club, a virtual personal stylist that sends outfits to people's homes.

He says: "Trunk Club was finding that only 33 per cent of its sign ups actually converted to active customers. It's because most people don't really want to talk on the phone about their dress sense. When Trunk Club started to offer an iMessage type experience inside the app, conversions went up to 87 per cent, and revenue rose by 50 per cent."

Palmeri attributes this to the asychronous nature of messaging; people can respond at their leisure. And then there's the richness of the experience itself. Users can look at product images inside the session and swipe yes or no to them. Anything they buy is saved as an attachment that serves as a record of the order, then the delivery and then the invoice.

Apps forever
"These attachments are like a aggregated record of all conversations. There's no need to leave the conversation to access this record. It's incredibly powerful," says Palmeri. Of course, Layer is basing its mission on the assumption that brands will continue to have apps. In the last two years, some tech thinkers have begun to question this. They say that apps and sites could go away as brands just become chat bots inside Facebook Messenger et al. Palmeri disagrees. But he's happy for the notion to persist.

"The idea that big companies won't have their own properties for talking to their own customers is simply ridiculous," he's says. "But I hope they keep saying it. It sounds so absurd. And that absurdity is perfect for us."

Ron Palmeri, CEO of Layer

"Messaging will be the atomic unit of modern commerce"

US start-up **Operator** thinks it's found a third way between the human warmth of high street shopping and the addictive convenience of e-commerce. And it all revolves around simple mobile messaging.

In the beginning there was trade. A person with something to sell met a person who wanted to buy. It was nice. It was social. You could haggle. But it was also slow and, well, the range was limited. Then came commerce: high street stores and, eventually, online shopping. It was convenient. The inventory was close to infinite. But we lost that human touch.

Is there a third way? The US start-up Operator thinks so. It says its conversational commerce platform combines the warmth of human trade with the scale and immediacy of e-commerce. It's shopping by messaging. Indeed Operator's mantra is "messaging will be the atomic unit of modern commerce".

Operator launched in 2015 with a hugely ambitious mission: to 'unlock the 90 per cent of commerce that's not on the Internet'. Users simply download the Operator app and then type in any kind of shopping query. The app's human operators then make recommendations, take payment and arrange delivery – all via a chat session inside the app.

Faustian bargain
Jarah Euston, head of growth at Operator, says: "It's a new personal way to shop – a return to two people trading. We had big box retailing, but it was a faustian bargain. We abstracted out human interaction for efficiency and infinite inventory. So we're bringing back the human element but keeping the scale."

Operator recognises that its platform is not really suited to everyday items, so it is focused instead on purchases that require 'style, taste and expertise. For this reason, it routes queries to independent experts in areas like shoes, jewellery and furniture. The company says it selects its specialists in video interviews that test their knowledge and personable qualities. These experts earn commission on sales.

Euston says: "We're riding two big structural shifts. There's the supply side, with all the benefits digital can bring to inventory and delivery. But we're also riding the wave of the knowledge economy in a new way. What's gone before in gig economy – with Uber and Postmates and Instacart and so on – has centred on non-knowledge workers. We're evolving this from braun to brain. Our specialists can show off their skills on the platform while building a business off it."

Empathy
Operator's focus on high-end items and human experts would seem to exclude bots. Actually, the company has begun using them inside its Facebook Messenger service to automate some of the more mundane parts of the process. Euston says: "Bots can't do empathy. They can't know you're into mid-century modern furniture, but they can discern your size, age, gender and store that so an expert can answer your question more quickly."

Operator says its average purchase is $90 and that 10 to 15 per cent of queries are converting. And Euston confirmed that the service had sold 250 engagement rings. It doesn't get much more personal than that.
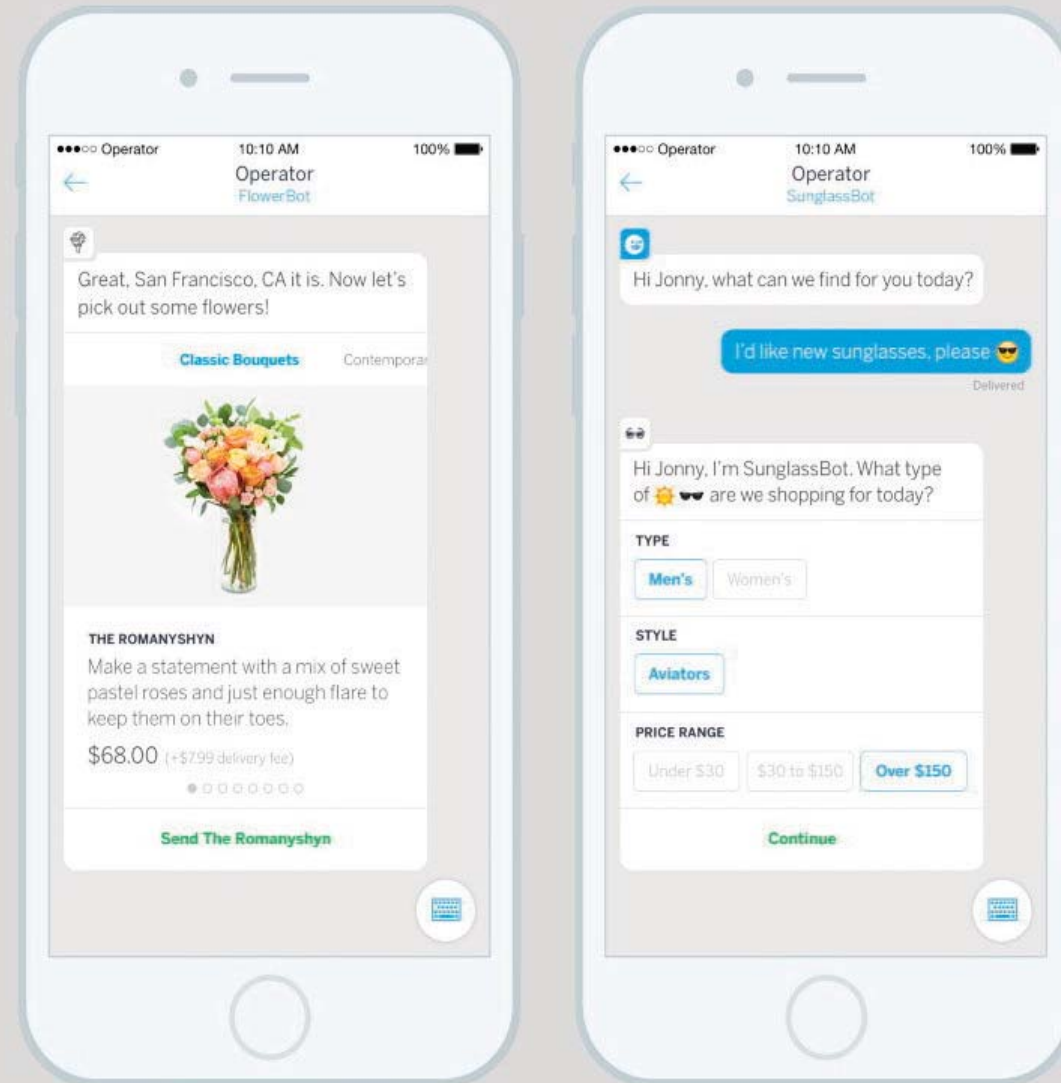
Say hi then buy

The best payments experiences are invisible, argues **Dave Birch, director of digital payments specialist Consult Hyperion**, He believes they will disappear inside OTT messaging apps...
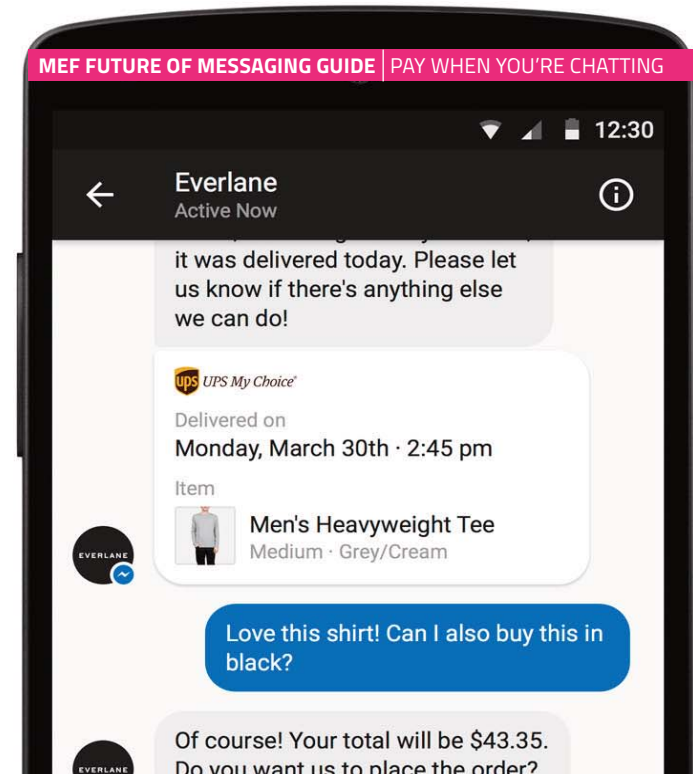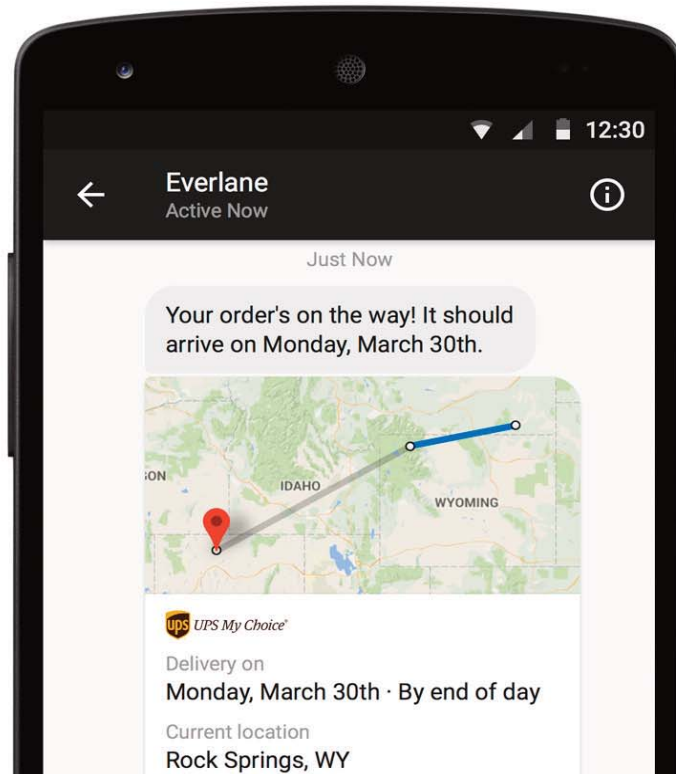
When Apple Pay launched, much fuss was made about its contactless payment feature. Look, you can pay with your phone. No plastic! But two years on, 'tap with Apple Pay' has made relatively little impact. In fact, 2016 research by First Annapolis said just 15 per cent of those with compatible phones regularly use it.

This doesn't surprise Dave Birch, director of digital payments consultancy Consult Hyperion. Right from the start he argued that contactless Apple Pay was a side show. But that doesn't mean he's bearish on the service. Quite the contrary. He thinks Apple Pay and similar services like Android Pay will change the way we transact. And the key to this revolution will be in-app payments.

Blurred lines
"Payment inside apps is fast and seamless. People are used to it, and they like it," he says. "I think eventually we'll see the lines blurring between paying in-store and paying online. You'll be at the supermarket and the app will wake up, know where you are and – when it's time to pay – offer you a choice of payment options and the chance to redeem all your loyalty points and so on. I think this is inevitable." So, how does this relate to messaging? Well, as chat apps increasingly dominate the time spent online, there's a good chance that these payments could be made inside messaging services. "I realise people don't want to download an app for every brand they do business with. So I think most of the activity will be within a handful of key apps, and messaging apps will be among them."

Social matters
Of course, this is already happening in China where barcode-enabled payments by WeChat are commonplace. In the West services like Venmo and Facebook Messenger are rolling out merchant payments. Birch believes their potential is not just due to the fact that people spend time inside these apps. It's also to do with the very nature of social.

He says: "If you look at the Venmo and Pingit by Barclays, for example, you can see that actually Pingit is a much better product. And yet Venmo in the one that's really gone mass market. I think that has to be because of the integration with social media. Somehow Venmo made payments social, and it really stuck. This bodes well for Facebook and the rest. If you can send money as easily as you can send a pic, then the adoption seems inevitable." And clearly, when that happens, the next stage could be turning the whole payment process into a conversation.

Forensics
Yes, we're talking chat bots. And Birch is a believer. "Online chat is already a much preferable way to talk to brands and retailers. Better than voice. It's not just quicker, but it provides a forensic record of your activity, which is important.

"Its inevitable that this will move to mobile apps and messaging. Parking is an obvious case. Instead of downloading multiple apps all of which ask you to sign in and enter card credentials, you would just start a chat in WhatsApp and type 'I'm parking my Volvo for four hours'.

"You don't even need to give your name or car or even location. WhatsApp knows all this already. That's a compelling user experience for people and brands." And it's safer too thanks to the unique identity of the device. Birch says: "Chat with a brand by email or web and a hacker only needs your password to pretend to be you. But with a mobile messaging app, they would need to steal your phone and get through the PIN or touch ID. It's a lot more secure."

Dave Birch, director of Consult Hyperion
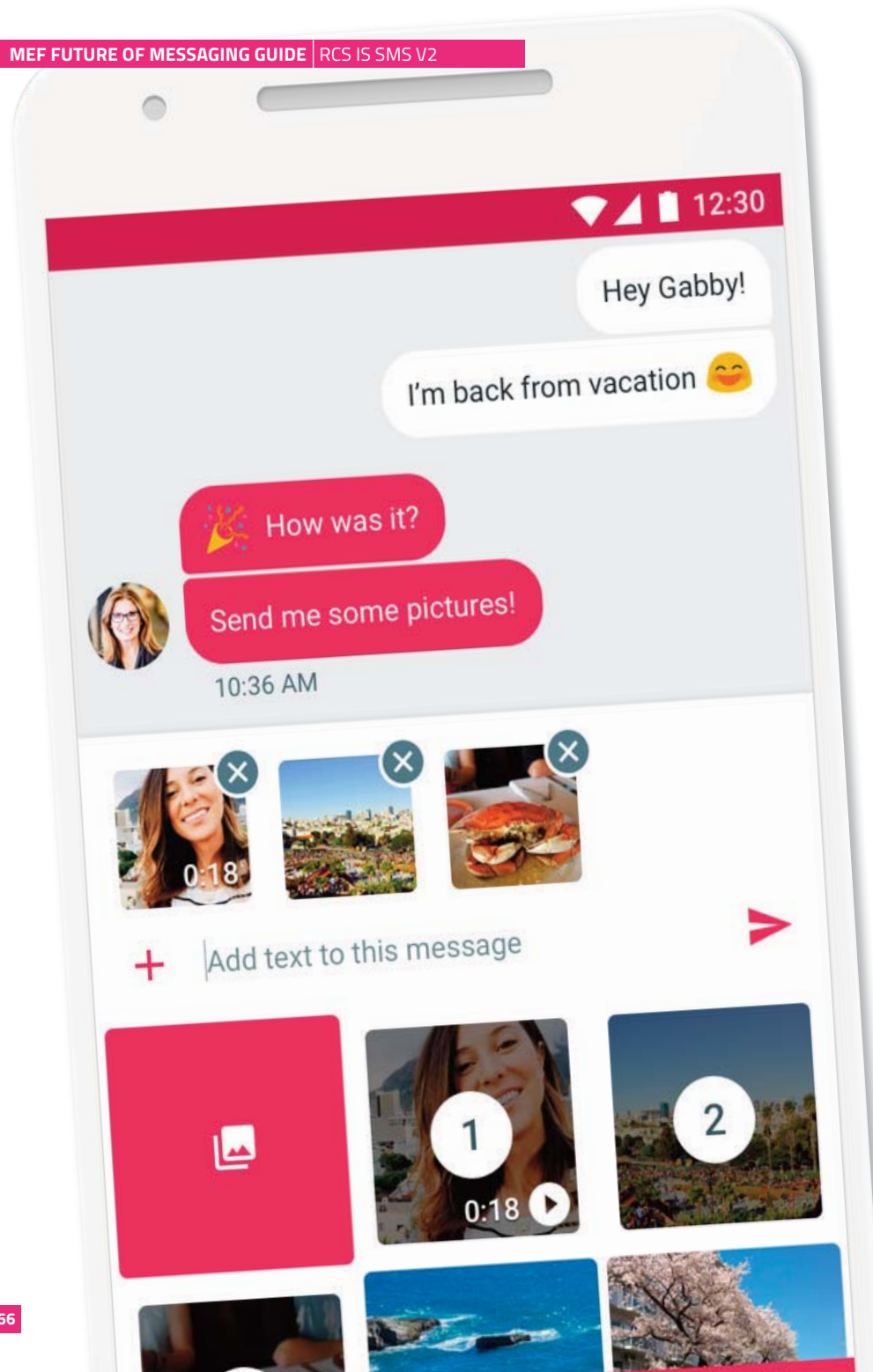
Next gen SMS?
Google it

Is SMS due an upgrade? The world's operators - and Google - think so. They have teamed up to work on a new version of standard text called **RCS (Rich Communications Services)**...

S MS is many things. Many wonderful things: it's universal (on every handset); it requires no user manual (everyone gets it); it works without a data connection. These attributes make text the perfect medium for non-nonsense communications, and indicate why business to consumer messaging is exploding.

The pull of OTT
But the basic functionality that makes SMS so appealing is not enough for everyone. Which is why hundreds of millions of consumers now use so-called 'over the top' apps like WeChat and Facebook Messenger. They offer group chat, messaging history and the ability to share multimedia content and see if a recipient has read a message.

Now, the world's mobile operators are working on a second iteration of SMS called RCS (rich communications services), which keeps its universality but enhances the channel with OTT-like features.

Actually, work started first on the new platform in 2008, and the project went through various iterations until 2015. It was at this point that Google bought Jibe (an independent company that specialised in building RCS services).

Then, in February 2016, the GSMA (the operators' trade body) confirmed a formal collaboration between major operators and Google to work together on the RCS messaging standard. Essentially, Google will build a single Android RCS client based on a universal RCS profile the operators all agree to. This client will be 'standard' for Android devices.

Sprint at the start
In November 2016, Google disclosed that more than 58 carriers and manufacturers, collectively covering a subscriber base of 4.7 billion people, had committed to this single, standard implementation of RCS. It also revealed that US operator Sprint had launched RCS messaging to its customers using Android devices

Thus, Sprint subscribers had their standard SMS experience upgraded via the Android Messenger app. In other words they could use SMS with features such as group chat, high-res photo sharing (100x larger than was possible before), read receipts and more.

On its blog, Google described how RCS improves the user experience: "For example, though MMS today supports group messaging, you can't do some of the things people now expect – like naming the group, adding new members, or leaving an existing group. That will change with RCS."

Default is yours
Google added that in 2017, all new Android devices from Sprint will come with Messenger for Android pre-loaded as the default SMS and RCS messaging experience. And in the coming months, it will launch more partnerships with operators in other regions. Meanwhile the GSMA says it has a "path to one billion users" for RCS.

Clearly, the challenge ahead for Google and for the world's operators is to meet these objectives. After all, messaging has to be universal. A platform only works if your friends can use it too.

What's neural in predictive text?

Swiftkey's new model for predictive text borrows from the human brain. It's a step change, says **Dr Ben Medlock, CTO of SwiftKey**…

People love to text, but they hate to type. That's why the history of mobile messaging has seen users jump at any breakthrough that reduces the need to tap. They abandoned the numeric keypad for the QWERTY touchscreen. They embraced emoji and gifs. And they downloaded predictive keyboards.

Perhaps the best known of the downloadable keyboards is SwiftKey, which launched on Android in 2010. Swiftkey's breakthrough was a three-word prediction bar above the keys that predicted a user's next word. Powering the feature was a system based on words previously entered by the user. This is known as the N-gram model.

N-gram was a big success. It's now used on more than a billion devices. But all the while SwiftKey had an even better solution: neural networking. This subfield of artificial intelligence mimics the human brain in the way it processes the relationship between words. SwiftKey knew the technology could deliver the ultimate goal of reduced typing. But neural networks devour processing power. They require large servers. For years, mobile processors just weren't up to the task. Now they are. So in October 2016, SwiftKey Neural Alpha went live.

On the fly
The neural networks model captures the relationship between words. Because it understands word similarity, it can compare words on the fly. The best way to understand how neural networks work is to apply it to actual typing. Say a user is typing 'this could take a…", the N-gram system might suggest 'look' because it has previously observed the sequence 'take a look'. The neural model would not make this mistake. Similarly neural networks can suggest words the user has never typed before. Dr Ben Medlock, CTO of

SwiftKey, says the breakthrough is preparing language processing for a future which moves beyond the phone and in which machines converse on behalf of humans.

Machine talk
He says: "Even when we launched in 2009, we had the intuition that the creation of language was going to be less about the arrangement of keys and more about the way the software processed the information. So while the N-gram model was a significant idea, we now need to work towards a future in which devices will become more varied and we will need new ways to create language."

That future is already being built. There is already a market for wearables and VR, though embryonic. And the challenge is on to find ways to 'talk' to them. Medlock says: "We need to work out the best way for these devices to take in a variety of data and signals –

that could be from voice or gesture or touch or whatever – and make conversations natural. After that, we can begin thinking about a future in which agents can create language for you."

Screens forever
He gives the example of a 'live' email 'out of office' function that responds differently to every message depending on the relationship between the sender and the recipient. "Machines should know you well enough to do this, like a human PA would. Our neural network launch is a step towards this. It's the logical conclusion of all the tools we've been building."

But don't assume this means an end to the traditional keyboard and screen. "There are limits to voice. If you want directions or cinema listings, you want to look at a map or menu, not have options read to you," says Medlock. "I don't think screens are going anywhere."

With thanks to our partners and the participants of MEF's Future of Messaging Programme

OpenMarket, a division of Amdocs, provides mobile engagement solutions for organisations to optimize their operations and enhance relationships with customers and employees. Major enterprises choose OpenMarket for its domain expertise, service flexibility, demonstrated performance, reliability, global scale, and corporate maturity. It provides connectivity to more than 200 countries, enabling businesses to engage with nearly every mobile user around the world.

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CLX Communications AB (publ) connects enterprises to people and things. We combine programmable APIs and cloud computing with our unparalleled Tier 1 Super Network to make it easy for businesses to embed global communications, including voice, SMS and mobile data into their apps, business processes and IoT devices. CLX Communications AB (publ) is listed on the Nasdaq in Stockholm.

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As market leader in enterprise application software, SAP helps companies of all sizes and industries run better. From back office to boardroom, warehouse to storefront, desktop to mobile device – SAP empowers people and organisations to work together more efficiently and use business insight more effectively. SAP applications and services enable approximately 320,000 customers to operate profitably, adapt continuously, and grow sustainably.

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MEF is a global trade body that acts as an impartial and authoritative champion for the mobile ecosystem. It provides members with access to networking, collaboration and industry solutions. The MEF's goal is to accelerate the growth of a sustainable mobile ecosystem that drives inclusion for all and delivers trusted services that enrich the lives of consumers. The organisation was established in 2000 and is headquartered in the UK. It has chapters across Africa, Asia, Europe, Middle East and Latin America.

http://mobileecosystemforum.com

MEF's Future of Messaging Programme is a collaborative industry platform bringing together all stakeholders in the mobile messaging ecosystem to achieve a common goal to promote and accelerate best practices in order to limit fraudulent behaviours and identify new opportunities for mobile messaging. Global programme members participate in two dedicated work streams Fraud Management and Market Development working together to secure a more transparent, innovative and fraud-free market for the benefit of consumers, enterprises and industry alike; creating a sustainable future of messaging.

http://futureofmessaging.com

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