Words Nick Scott

Special report

SHOULD YOU LEARN TO CODE?

No longer one of the dark arts of the information revolution, coding is now a mainstream workplace skill that UK business leaders need to embrace – and quickly. *Director* talks to industry experts about the importance of learning to program

The menu, when it comes to ensuring ongoing business success, has many popular staples: sound market knowledge, thoughtful recruitment policy, meticulous trend prediction, solid customer services policy and so on. But what if there were an inconspicuous specials board, available to all but noticed by only a minority of leaders, on which something is offered that could give a massive competitive advantage to enterprises of all sizes?

The special dish in question is coding: the practice of writing a set of instructions, comparable to a recipe, which a computer can understand, in order to create apps, websites and other essential tools for modern business. Myths and stereotypes abound when it comes to the practice: some of us, hearing the word "coding", picture anaemic social outcasts in *Red Dwarf* t-shirts, hunched over laptops in the bowels of blue-chip companies' vast edifices, casting mysterious cyber-spells that no ordinary denizen of the corporate world will ever need to fathom, let alone feel inclined to do so. But with the fourth industrial revolution – a spate of breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles and 3D printing – already upon us, a basic knowledge of coding could soon become as critical in the workplace as basic literacy and numeracy have been for centuries.

Despite its burgeoning relevance right now, coding is not actually anything new. Its story begins in the middle decades of the 19th century, with English mathematician and inventor Charles Babbage's attempts to build a steam-powered calculator. It was Babbage's chance encounter at a party with Lord Byron's daughter Ada Lovelace, a 17-year-old maths prodigy, which led to a discovery that defines the digital world as we know it today: the notion that numbers, in sufficiently complex sequences, can represent entities vastly more sophisticated than just quantity and calculations.

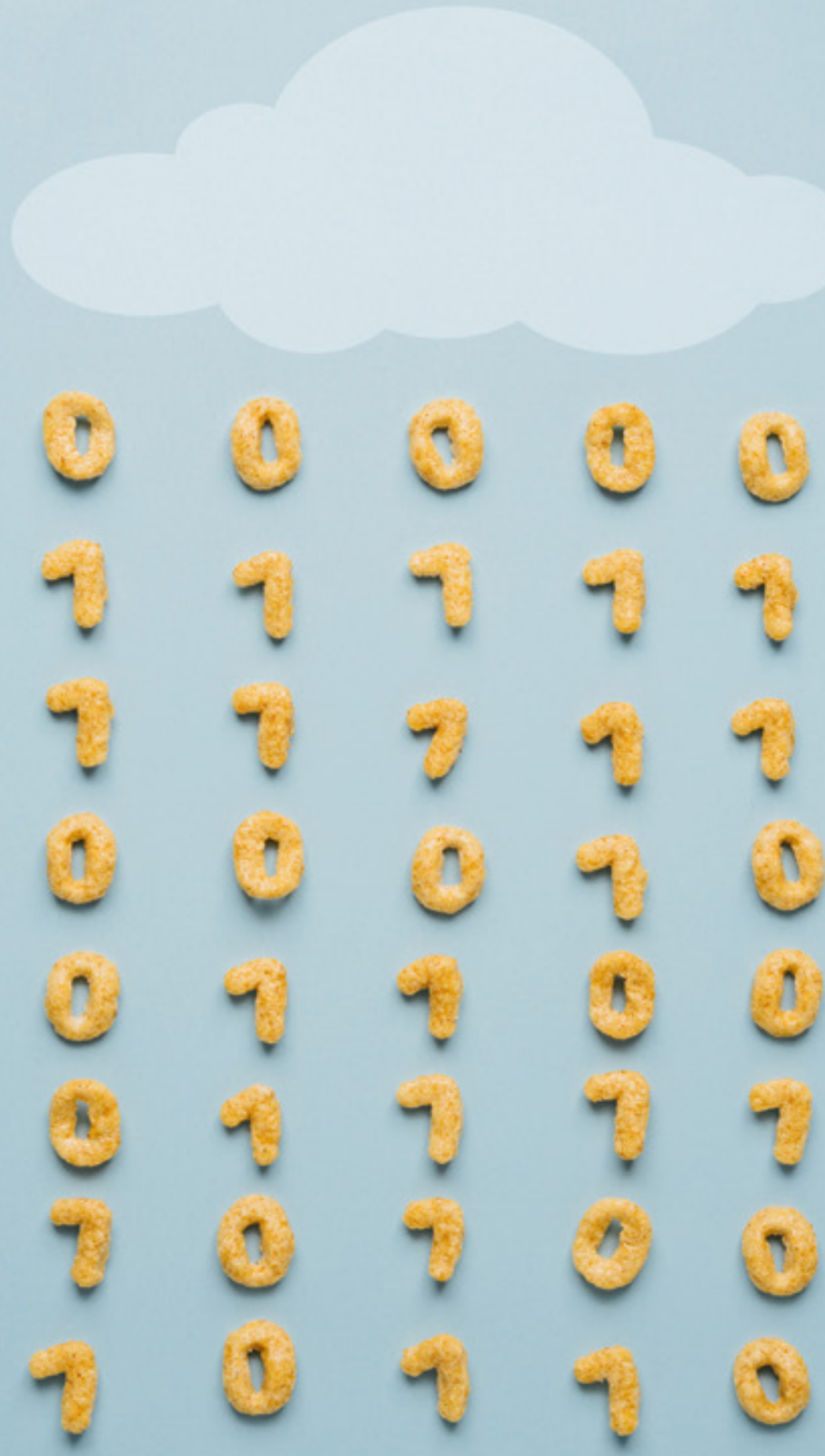
"Ada Lovelace is credited with being the first computer programmer," explains John Ridpath, head of product at Decoded, a London-based tech firm dedicated to enhancing digital literacy. "She had the idea that the same calculator that Charles Babbage was working on could process any set of instructions passed to it; that just by increasing the complexity of those instructions you could make it do more than mathematics, and actually represent graphics on a screen, or create a musical note."

A century and three-quarters later, the same basic principle underlies pretty much anything that's digital. "Every movie you watch, every website you visit, it's all just zeros and ones transmitted as miniscule flashes of light and electricity," explains Ridpath. "Binary code is actually like an ultra-sophisticated version of Morse code, which can represent the entire alphabet just with dots and dashes."

Early computer programmers used punch cards – sheets of paper with check boxes, with a hole equalling 'one' and no hole equalling 'zero' – to make computers do their bidding, so obviously a few giant leaps were required to create the situation whereby today, for example, *The Godfather* trilogy in high-definition can travel at lightning speed along under-sea fibre-optic cables. And a major one of those leaps came just after the Second World War. "In the early 1950s people began to get the idea that while ones and zeros are great for a computer to understand, they're not the best way for a human to communicate to a computer," says Ridpath. "So along came a woman called Grace Hopper, a rear admiral in the US Navy, and one of the people credited with creating the compiler. The compiler meant that instead of writing in ones and zeros, I can write in a language that looks more like English, and the compiler turns it into ones and zeros for the computer."

Now that computers are so much faster and more powerful, and expectations of them have expanded exponentially, compilers have also become more and more sophisticated, and are especially effective now that they work in tandem with each other.

"If there's a million lines of binary required to make a button appear on a screen, maybe the first compiler brings it down to 500 lines of code," explains Ridpath. "Then someone writes a new bit of software which means you only have to write 20 lines of code [as a short cut to



Case study

Kirsty Maxey, joint managing director of communications agency Teamspirit, on Decoded's "Code_in a Day" course

Maxey approached her one-day course – which Decoded claims takes students "from zero skills and confidence to coding your own app in a single day" – with what she describes as "a basic understanding of code", but was astounded at how accessible she found it. "I hadn't appreciated how open the coding community has become, and how much code is shared," she says. "So if someone has already found a way round something, you can basically borrow/copy that piece of code. Which explains why technology has moved at such a pace. There are libraries of code available and this open-source culture allows you to start building immediately."

Over the course of the day, Maxey built a geolocation app that allowed her to track her dog when he was out with the dog walker. "More importantly," she says, "it helped me understand the jargon and how developers and coders think, and the environment they like to work in."

Even a smattering of coding education, Maxey says, is invaluable for leaders. "It teaches you to stay curious. It helps you understand different ways of working and the advantages of working in a more open-source and agile culture. It empowers you to understand how technology is being developed. Understanding how coders think and work helps us provide a better environment for them."

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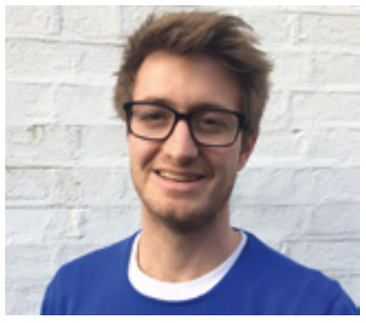
that 500]. Then another comes along and suddenly it's one line of code. In the end, when making a modern website, a line of code could be enough to make a text field, like the Google search box, appear on a web page."

Ridpath has heard software we use on a day-to-day basis compared to the world's most elaborate cathedrals, in terms of the way new architectural elements are built upon those created by today's pioneers' predecessors. As a result of these cumulative efforts, he says, these days you don't have to be any kind of computer boffin to become a competent coder yourself. "When it comes to creating user-facing applications like an app or a website, we find you can create an awful lot in just a day," he says. "Over the course of that day you'll write maybe 30 lines of HTML, another 30 lines of another coding language like CSS and another 30 of JavaScript to create your own personalised geolocation web app." Meanwhile, students who take longer courses reportedly tend to find themselves beginning to think in code, and writing it with increasing fluency, as one might with a foreign language.

Digital skills demand

Coding, then, is far easier and more accessible than most people think. And yet, despite becoming one of a handful of nations to have introduced coding to the national curriculum in 2014, the UK is facing a skills gap which costs the economy an estimated £63bn a year in lost income. "Demand for people with digital skills massively outweighs supply, and that gap is increasing," says Edward Ward, UK manager at entrepreneurs' coding bootcamp Le Wagon. "There are currently 220,000 vacancies for digital



roles in the UK. By 2023 this figure is expected to be 900,000. That is how rapidly it's growing, and clearly shows the need to educate your own employees in coding or at least bring in young talent to grow with your business."

Ward – who won various entrepreneur awards and was runner-up in the 2014 British Inventors' Project for his creation of innovative bicycle light Veglo – points out that you don't need to be running an inherently techie enterprise, such as a smartphone app or e-commerce platform, to reap the rewards of basic coding knowledge, and offers the example of one Le Wagon student who created a market-ready banking app for short loan services over a period of two weeks.

"The benefits are never-ending," he says. "Having internal coding skills opens the future to your business. You don't rely on agents to build your prototypes any more as you have these skills in-house. There's no limit, and therefore businesses can experiment and create their own tech products to stay ahead of the competition." Outsourcing is, of course, an option, but has major downsides: "If you outsource jobs to web agencies, they're going to take you to the cleaners on price, take months to do it, and tie you in on long-term cost with projects that only they can update," warns Ward.

Even if you don't intend to do coding yourself, learning the basics can reap dividends. Speaking at the IoD Annual Convention 2014, Kathryn Parsons, co-founder and co-CEO of Decoded, asked a pertinent question: "How can you innovate, how can you be relevant, how can you lead, if you don't understand the ingredients you're playing with in this modern digital economy?" Sarah Wood, chief executive of tech firm Unruly, who undertook a one-day course, agrees: "It's the language of the world we live in, and you need to have a grasp at least."

And it's set to become a more widely spoken language as various training enterprises deposit more talent onto the scene: companies such as Northcoders in Manchester, which aims to create a pipeline of coding talent, with a view to business leaders employing its graduates, thus growing their teams quickly without the expense of recruitment agencies.

"Those who come on our course are either not in work, or in jobs where

"Having internal coding skills opens the future to your business – you can create your own tech products"
Edward Ward, UK manager, Le Wagon

Main picture: Decoded's Kathryn Parsons bottom left: Le Wagon's Edward Ward

they're not happy or don't see a future," explains Amul Batra, an investor in the venture. "Last year we took on a lady who was stacking shelves in her local Tesco. She completed the course, and we put her forward to a fintech company. She's now a successful software developer and mentors others in the field." Northcoders produces 20 graduates every 12 weeks, and 80 per cent of its alumni are now employed as software graduates.

With such technically minded people becoming more populous in the workplace, Ridpath notes, a business leader who learns basic coding is going to have vastly more fruitful conversations with them. "You leave Decoded able to converse with some degree of fluency and confidence when using terms like APIs [application programming interface], libraries and so on," he says, adding that it also gives leaders a broader perspective and a bigger arsenal when it comes to trouble-shooting. "Think about situations where someone says, 'We should build an interactive map for our website – let's hire a designer and a developer', when actually you can embed a Google map using the Google Maps' API, which takes two minutes. Having that mind-set saves time and money."

He also points towards forthcoming legislation changes such as PSD2, the second Payment Services Directive. "All banks in the EU will, from January 2018, have to open up about how they share customer data, and also release it in an open way to make it easier for customers to move between providers," he explains. "Technology created the problem but technology is also the solution, so by understanding things like apps, data and APIs, leaders get a better sense of why this legislation is being brought in." There's also, he says, immense creative satisfaction involved – "I love having the freedom to be able to create something digitally" – and asserts that becoming code-savvy is a personal career move too. With a lot of UK jobs under threat from automation, it's surely better be part of the automation drive than part of what will be made obsolete by it.

Whatever your motives for learning, the consensus is that "sooner rather than later" is a sage approach. "The longer you leave it, the more dangerous it could be for your business," says Ward. "Having basic knowledge can save time and money on your business development." Parsons put it more ominously at that IoD speech, calling on her audience to "become an active participant in the digital world rather than a passive one". And there's nothing coded about advice as hard-hitting as that.

Read the *Director* team's experience of Code in a Day at **director.co.uk**

Watch Decoded CEO Kathryn Parsons' speech at the 2014 IoD Annual Convention **director.co.uk/coding**

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