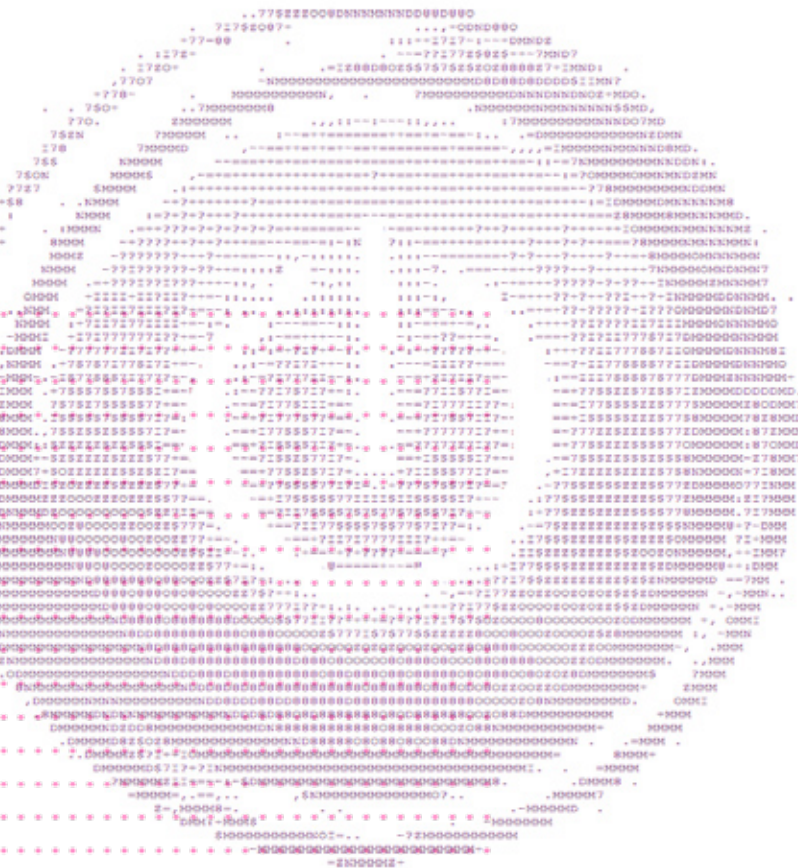# Digital Architecture

Evolving from classic to digital architecture

The expert perspectives

Virgin media BUSINESS

Sometimes it seems everyone has caught the 'digital transformation' bug.

But in reality, by April this year, fewer than half (42%) of CEOs had begun digital business transformation, according to a Gartner report.

And of those companies that say they're transforming, it's likely only a small proportion are actually making the real architectural changes necessary to thrive against new entrants and existing rivals. They're the companies unwriting their futures.

We're all aware of the truly disruptive companies – like Netflix, Airbnb and Uber – and it's now up to CEOs to make sure their company does not go the same way as Blockbuster.

And while CEOs are the ones with the power to make the changes, it's up to the chief information officers (CIO), a chief technology officers (CTO), and chief digital officers (CDO) to drive the changes.

To tease out what that means, we speak to the Group CTO of GAME Retail, Andrew Grainger; the CTO of AVADO Learning, Mark Ridley; and Rich Pearce, CTO at Crowdcube Limited.

We're asking them about the differences between 'classic' and 'digital' architecture, the actions they've taken to transform their businesses, and how they've found success in the digital era.

It's your chance to learn from the very best.
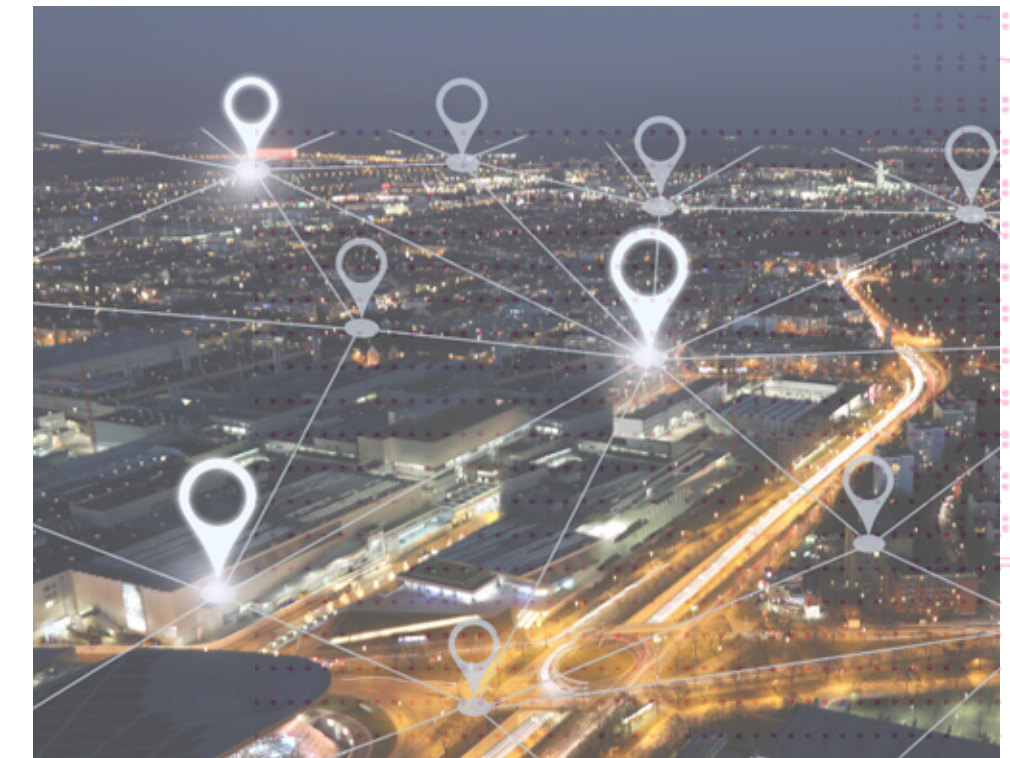
Meet the experts

When you're discussing digital transformation, you want to hear from the best minds in the business.

GAME Retail
Andrew Grainger
Group CTO

Grainger has been CTO at GAME Retail since the start of 2013, with his role recently expanding to encompass the IT, ecommerce, customer service and supply chain functions of the business.

He brings some top experience, having worked at both Gamestation and GAME for over a decade in a range of roles.

Most importantly of all, his favourite game is Halo: The Master Chief Collection.

AVADO Learning
Mark Ridley
CTO
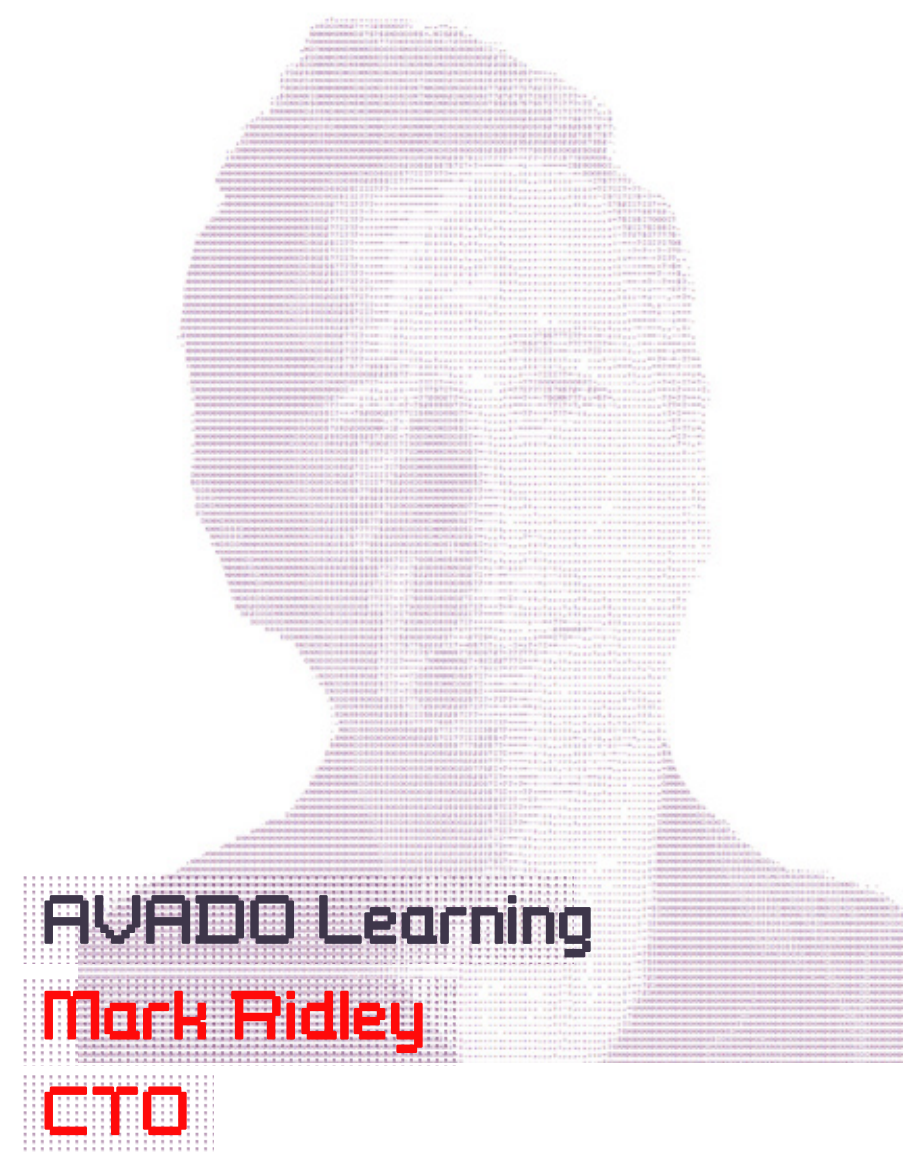
Group Technology Officer at leading venture builder, Blenheim Chalcot, and CTO at AVADO Learning, Ridley has been recognised as one of the Top 10 CTOs in the UK.

As co-founder of reed.co.uk, the UK's largest jobs and careers website, he helped build a team of four people to over 350. He also created the company's internal incubator, Monday Labs, to foster new products.

Crowdcube
Rich Pearce
CTO
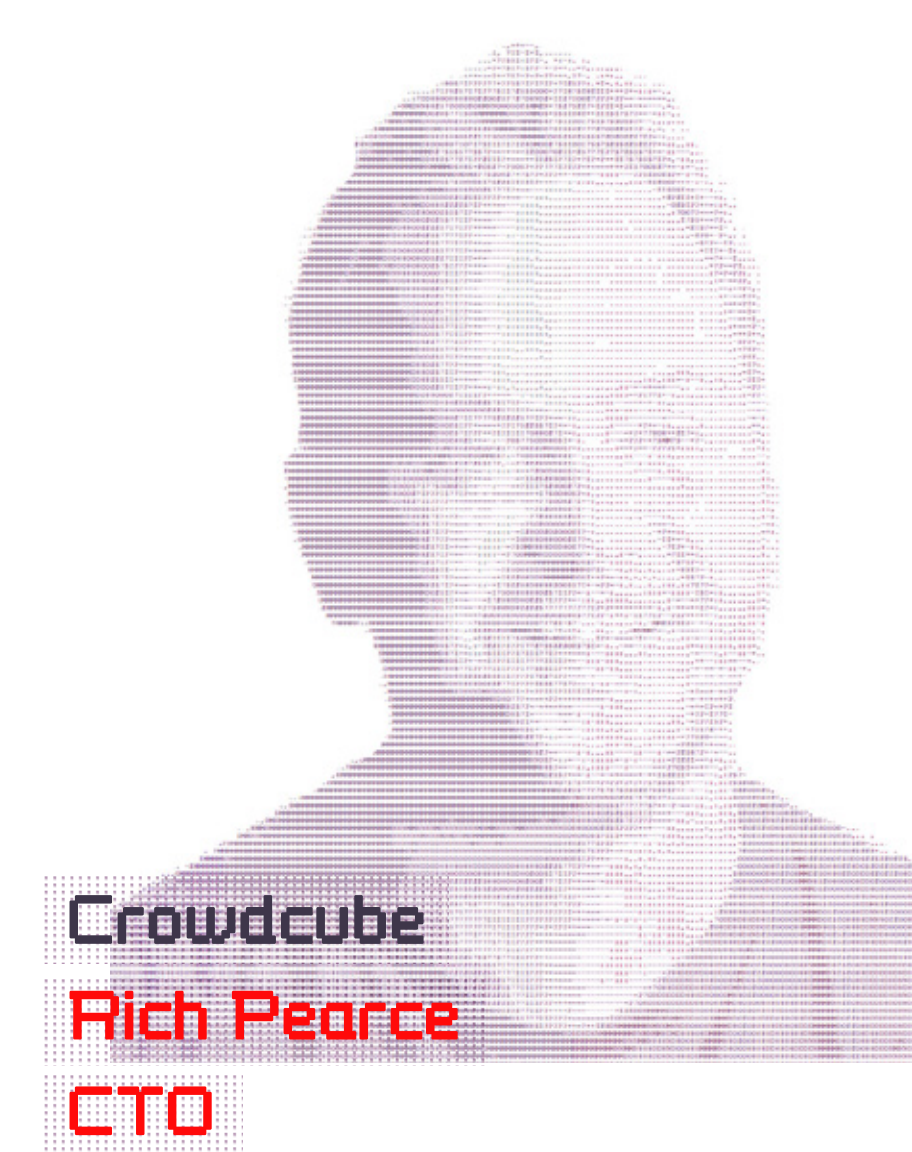
Rich is CTO at Crowdcube, having joined in February this year. A technology leader who loves to focus on agile delivery and software engineering, he's got experience delivering software products from websites, apps and backend services, to embedded systems.
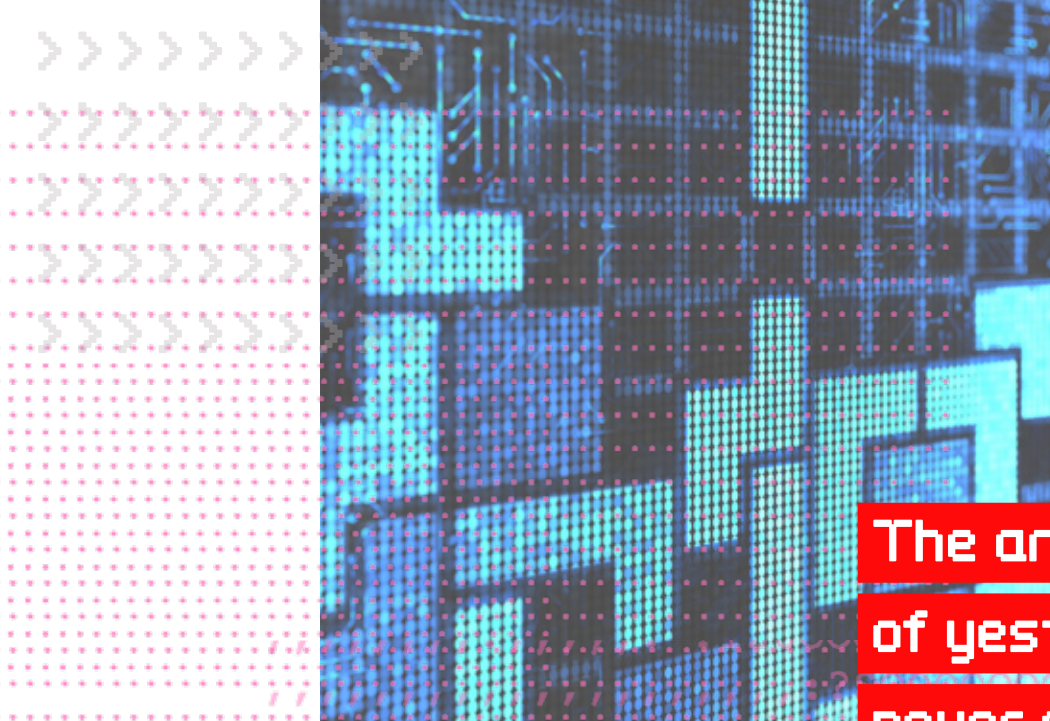
What gets him up in the morning? It's building teams, developing people and delivering great products.

The challenges of classic

"How do I justify this enormous expense?"

Classic architecture itself has evolved over a number of years, but on the whole it was (and is) similar in most organisations.

The architecture of yesteryear was never really future-proof

"It was large server farms – which would be big investments – and often an enterprise would have a favourite vendor, and everything would be consistent and very controlled," says Ridley.

"You would have either hosted data centres or what people would say is their own data centre but was essentially the scale of a server room, and the infrastructure would generally be made up of large monolithic servers and a lot of investment in tin, which would be very expensive," he added.

Expense wasn't the only limiting factor. There were also long lead times, so if an IT manager wanted to buy servers, it wasn't the kind of thing that could be completed overnight.

"I remember the first servers that I bought cost as much as my first car, each of them, and so I didn't understand how I could even make a business case to begin with. How do I justify this enormous expense for something that will only last me three to five years?" Ridley questioned.

The infrastructure would also need to be connected to the internet through other suppliers, with individual connections to every supplier that enterprises needed to be connected, leading to an over-reliance on specific connections, rather than a ubiquitous internet connection.

It's evolved today but it shows how the architecture of yesteryear was never really future-proof; It was designed to be built on top of – rather than continually adapting and changing.

At GAME, the classic architecture consisted of enterprise resource planning (ERP), a finance system, point-of-sale systems, supply chain and management information systems.

They were systems that didn't allow for much change or flexibility, and they were very much based on server hardware and classic data centre configuration.

And aside from the slow speed of change, there was another frustration for IT leaders:

"You would find talent who were very defensive of their areas of knowledge. They wouldn't document or collaborate and so it could be hard to understand everything across the technology stack," says Ridley.

The shift to digital

"It's not just bolting systems on the side"

Waiting is a dangerous game. Organisations thriving now could suffer if a digital player came up with an innovative – and more customer-friendly – option.

So, businesses need to unwrite their future and make their move to a digital environment now. Which is what GAME's Grainger wanted to do in a market which was clearly shifting from physical to digital content.

"As a retailer that was selling physical products in its ERP, we had to change to incorporate digital products and this meant different margins, different distribution mechanisms and different costs. It was a challenge but it has been very architecturally driven, as opposed to bolting systems on the side," he explained.

Essentially, he wanted to make sure the organisation had 'digital' integrated within its architecture. For the retailer, long gone are the days of relying on hardware; now 90% of its infrastructure is virtualised and, rather than relying on a primary data centre and back-up data centre, it now has an 'always on' centre across multiple sites.

"We can spin up virtual machines as and when we need to, which gives us more capacity and keeps the costs down," he stated. It means the company now has much more flexibility, and gets better value for money with the infrastructure at its disposal.

"The company now has much more flexibility, and gets better value for money"

A new direction

"Without connectivity, you don't have a business"

AVADO Learning required a similar move to a digital environment, in its case to replace physical books with e-learning alternatives.

According to Ridley, "The biggest change is moving away from large monolithic architectures and buying your own servers, to buying and consuming a service from a massive cloud provider," he says.

But, he believes, it increases the company's chances of success because it enables the IT department to test and learn faster. And that's a view echoed by Crowdcube's Pearce: "The benefit of using cloud infrastructure and continuous delivery approaches for us at Crowdcube – and other businesses – is the ability to experiment. It's the ability to take an idea and actually validate it with customer feedback."

But for years, enterprises perceived cloud to be insecure – or at least, not as secure as their on-premise alternative. That perception is changing, however, and Ridley suggests that by moving to a cloud approach, organisations can rethink how they design their architecture with security in mind, while also benefiting from more granular security methods.

"In the classic architecture, enterprises put a big wall around their IT infrastructure and we would consider it to be secure, whereas when you move to the cloud you design much more for very granular security.

This isn't necessarily more secure but it is the consideration that is given to security that has completely changed," he says, suggesting that it is this consideration making enterprises more secure in the face of more sophisticated security attacks. With the constant increase in data breaches and cyber-attacks, organisations have to consider

employees, contractors, or anyone with any form of access to the IT environment as a potential hacker – and this is why granular security makes more sense.

"With the cloud, we tend to give much greater consideration to the single byte of data and the individual that's accessing it," says Ridley.

And alongside security and cloud computing, is connectivity – an increasingly important asset in the digital age. "As enterprises embrace software-as-a-service (SaaS), digital platforms and the cloud, it means we're exposing more of our infrastructure from the cloud itself, making much more of our businesses available, and therefore connectivity is absolutely premium for our businesses," says Ridley.

"You can't let down a supplier or a customer by not having connectivity. Without connectivity in a digital business, you often don't have a business," he emphasised.

"It's the ability to take an idea and actually validate it with customer feedback"
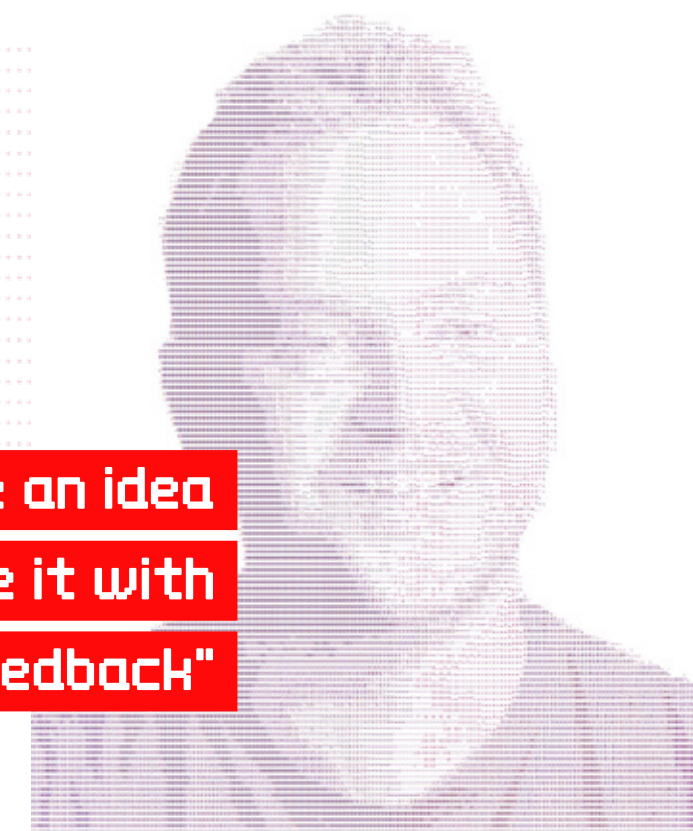
The right solution

"APIs are really critical to this evolution"

One size doesn't fit all, is a common phrase in IT circles, and it rings true for digital transformation too.


Companies will have success using different methods of transforming their architecture. At GAME and Crowdcube this has meant keeping many of the core systems in place for the time being, but shifting processes and the underlying architecture to become more digital.

The use of APIs is critical in this change: "There have always been ways to interconnect to get data in and out of systems but APIs were really the beginning of a process of making that data understandable by lots of diverse systems," says Ridley.

This meant that instead connections of between systems being customised, they would be freer. So, APIs had led to more collaboration between businesses that were using classic architecture. However, their importance for digital businesses is even greater.

"We're starting to see businesses which are predicated on the availability of APIs – companies like eBay or Airbnb, which rely on the availability of APIs to connect all of the things they're doing, whether it's through a website or enabling a mobile application to talk to their servers. Those APIs are really critical to the evolution of modern IT," says Ridley.

So critical, that Pearce believes Crowdcube's business wouldn't be possible without them – even though it didn't have an API until about a year ago.

"You're more agile than you would have been traditionally"
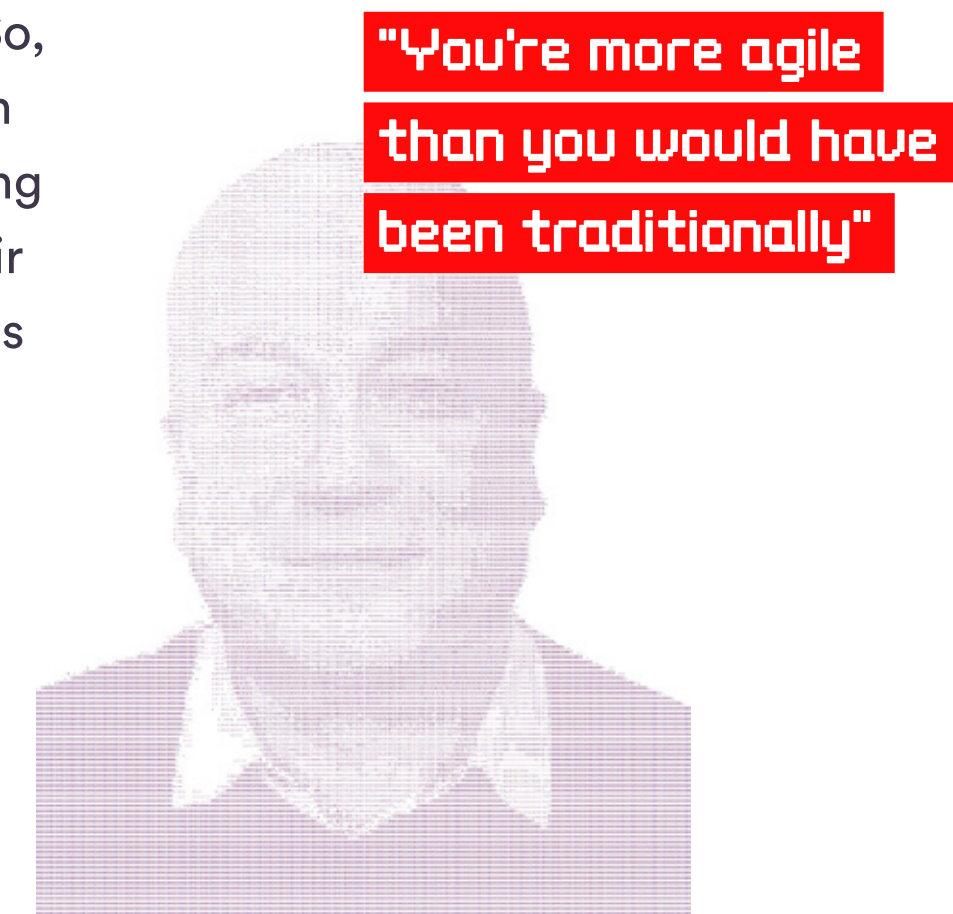
"We just had the website and no separation or decoupling between the monolithic part of the old PHP-based website and an API, which made it very hard when we tried to launch our iOS app," he says.

This spurred the company on to create a clear API to power its iOS app, and has subsequently led to the company developing an Android app.

For GAME, changing to a SaaS model and service-based architecture that is equipped with APIs has meant that it will be easier to change its legacy platforms and systems, when the time is right.

"The benefit is being able to make changes a lot quicker; you're more agile than you would have been traditionally. When we do change the platforms it is relatively straightforward for us; we can plug in the APIs again," says Grainger.

Where's the focus?

"It's a more personalised service for customers"

The key changes that enterprises are making are two-fold.

They're making the customer a key focus rather than an afterthought, and they're using data to get there.

"We're starting to see that decisions made around technology aren't based on guesses. Instead of making a big investment about something that you think is going to be successful over a three-year period, you can be more reactive to customer demand," says Ridley.

This is a combination of being able to test things quickly using the cloud, but also having a higher quality and quantity of data, with actionable insight.

Indeed, Grainger hopes a move to a new technology stack will help GAME to use the data it has to its full potential:

"We can then utilise the vast amount of data we have to give a more personalised service to customers both online and in-store."

He envisioned a time when people could walk into a GAME store and be recognised as a VIP customer using technology.

"The reason we haven't done it yet is because it is difficult and costly to do on a legacy platform," he says.

"You can be more reactive to customer demand"

Unwriting the future

GAME, Crowdcube and AVADO Learning are all unwriting their future in different ways.

It's the underlying architecture that makes things possible.

There isn't a 'right' or 'wrong' approach, but a range of routes to a future as a digital leader.

While GAME still has many core ERP systems in place, it is implementing digital technologies and has moved to change its architecture so newer technologies can be installed to work in conjunction with classic IT software and hardware. It's a bi-modal approach, and the next step for the company is to reconsider how it runs its ERP.

AVADO Learning is reaping the rewards of moving to a cloud computing environment, underpinning this with the connectivity it needs to continue to innovate. Having reconsidered its security from a cloud point of view, the e-learning company has become a digital organisation.

Crowdcube had a head start compared to GAME and AVADO Learning, in the sense it didn't have as much of legacy infrastructure to overhaul. However, it still needed to factor in APIs to become a digital enterprise; it's now a critical component of its business, along with cloud services and containerisation.

What all three companies have accomplished can be summarised as a better focus on the customer – including their experience – with data used to make it happen.

They're no longer restricted by a castle mindset: simply making do with the technologies at their disposal, cobbling together updates and security fixes in a frantic effort to keep up with the times.

This classic architecture saw the customer as an afterthought, sitting outside the company's moat, which weakened their relationship and experience with the company.

Now, the three companies' sole focus is the customer. By building out their digital architecture from the customer, they're able to create a constellation of elements which feed into the end user. It empowers the business to choose the right technology at the right time – and change this as they see fit. It's digital architecture that strengthens them against cyber-threats, and allows them to develop software and innovate quicker than their rivals.

Without digital transformation, these businesses could have faced a future as bleak as Blockbuster. Instead, they are prime examples peers can look towards.

There may not be a 'right' way to go about digital transformation, but the journey companies are taking shows it is a necessity. So, what's holding you back? Let's unwrite your future.

Unwrite your future █

We hope this helps you form your own digital architecture, and consider how a higher performance digital platform can unleash your digital potential.

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