

# nor(DEV):

m a g a z i n e

COLUMNS / REVIEWS / ARTICLES

issue (08):

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## 2020 Conference Edition

### // ARTICLES

- Train wreck
- Ramblings on micro services
- The Ladies of Norwich Hacking Society
- Tom's tips for the 2020s
- What is design?

### // SPEAKER PROFILES

#### PLUS

- Meet the community
- Sync the City
- Security

# nor(DEV):



**Your community needs YOU!**

Share your knowledge, join the discussion,  
learn from each other, meet new friends.

- - -

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## // Editorial

First of all a resounding thank you to Paul Grenyer. After working tirelessly to promote technology in Norfolk for nearly a decade Paul has passed on the baton to Alex Scotton and Shaun Church who have organised this year's conference. They'll also be organising the nor(DEV) events throughout the year. They asked me to act as editor, because of my passion and involvement with the local community and because of my experience working as a journalist for Computer News and New Scientist - I've enjoyed the challenge.

Norfolk has a thriving tech scene. Pickr is a semi finalist in the *Tech Nation* rising stars competition. Pickl and Safepoint, both Norwich based, were in the final 10 in the East of England 'Tech 50' list of successful firms in the Norwich-Cambridge Tech Corridor. To date *Tech Nation* has published government figures revealing that by January 2019 there was a digital tech business count of 19,090 in our region... We don't punch above our weight in Norfolk, we **are** a vibrant and active community.

The year ahead will bring all kinds of challenges. You only have to read Dom Davis' article about our appalling train service, or absorb Tom Haczewski's very amusing piece about the new decade to recognise that changes are afoot. There is also a degree of optimism around...

You'll be able to read about last year's successes from Sync the City with articles from winners, Little Onion Games and the people's choice stars, Reality Check.

In Meet the Community, discover about the realities of life as a young developer in Norfolk with Steven Beresford and see how Brisk has developed a new insurance app targeted at small businesses. Ardent followers of software debates won't be disappointed by the invigorating read from Adrian Pickering, about Micro Services. And if you've always wanted to read about design and cava - now's your chance with a scintillating piece from Tim Caynes. Finally, cyber security is always an engrossing topic. Tash Hales from the Ladies of Norwich Hacking Society and Paul Maskall of Dardan Security have both written two very different articles on the subject.

This year's conference speakers also reflect the diversity of our interests and passions. With over 28 different speakers, five tracks and a whole range of workshops they'll be plenty to get your teeth into. There's a full list of speakers and their subjects in this magazine. This year's nor(DEV):con promises to be a real treat with talks about software development, mental health, AI, company politics, SEO, JavaScript, and the closing keynote speech, given by Jennifer Wadella, talks about how fear of failure stifles innovation and how we should never be afraid to try anything new.

I hope this whets your appetite for this year's conference. We are **the** biggest tech conference in the east - join in the fun and give the grey cells a work out.

We look forward to meeting you.



*nor(DEV): team (L-to-R): Shaun, Kelly, Dom, Celina, Alex, and Mez*

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# // Speaker profiles



CHRIS O'DELL



DR GAIL OLLIS

## Developer experience Opening keynote

27 February 2020 12:30–13:30

Main Auditorium

When building software, we almost always think of our customers - the users of our product. But, what about the software we use to build our product? The tools the engineer uses for the job? Regardless of whether you adopted “off the shelf” solutions, or built tooling in-house to support your unique operational use-cases, they’ll often be put together by someone who had an itch to scratch or was tired of doing the task manually.

These tools build the Developer Experience of your engineers. This is an oft-neglected aspect of the software building process. Bottlenecks and ease of use for these tools tends to be overlooked as it is generally only visible to the engineers themselves.

At Monzo we gathered metrics around our development and deployment process to try and find the bottlenecks. We also turned to our UX experts for guidance and applied their discovery techniques to our engineers so we could learn about and improve their development experience. It’s an ongoing process as new bottlenecks and improvements can always be found. By sharing our experience, I hope to inspire you to grow your own Developer Experience by treating it as a product.

## “Humaning” Closing keynote

27 February 2020 16:15–17:15

Main Auditorium

Software development. It means developing software, the stuff that runs on computers, so what has that got to do with other humans? This keynote will look at answers to that. You’ll already know some of them, I’m sure, but I’ll be taking a wide-ranging view to illustrate the many reasons that good software development needs both ‘computering’ AND ‘humaning’.



KAREN POULTER

## It's not me, it's you: when change gets personal Opening keynote

28 February 2020 9:30–10:30

Main Auditorium

As people working in technology, developing code, leading teams, businesses, or simply just being people, we are changing the world and the lives of those around us, and being subject to unprecedented change ourselves. Every Single Day.

We owe it to ourselves and to those around us to understand change and the impact it has on us. How can we better prepare users, team mates, prospective clients to trust us with their change? To trust us to make them change?

And what happens when we are not the protagonist but the subject of change, maybe we saw it coming, maybe we didn't. How can we better prepare ourselves?

From a background doing all sorts of tech roles in all sorts of places. From being a mother, wife and not unfamiliar with bumps in the road along the way, this is a personal and light-hearted look at the world today and a few tips learnt along the way that might make your own day to day at little easier.



JENNIFER WADELLA

## When did we become afraid to try? Closing keynote

28 February 2020 17:30–18:00

Main Auditorium

We live in a world where we never hear about failures in a positive light, only the success stories. Our education system, work performance metrics, even social media glamorizes getting the “correct” answer the first time, completely discounting the trial & error before that leads to the eventual success.

While technology is as “cheap” as the hours it takes to write code and the bar is low, we are still terrified to fail and it keeps many of us from trying anything at all. This fear of trying stifles any chance of innovation we may have. How can we become unafraid to try again?



JEZ HIGGINS



JAMES COPLIEN

## A mouthful of C++

27 February 2020 13:45–16:00

Board Room

This participatory session will give you a taste of C++. We'll write some small programs, kick around some ideas, have some conversations, with the aim of getting a bit of a feel for the language - what it looks like, how it differs from or is similar to the languages you already know, and maybe even how some of it works.

We'll try to tour round the major features of the language, but we will, of necessity, have to go at a bit of a lick so it'll be something of a whistle-stop tour. What we won't be doing though is dwelling on the history, engaging in diatribes about why such-and-such is better than so-and-so, and we'll try and avoid esoterica. I hope it'll be fun, if slightly frantic.

## Hubs: an organizational construct for scaling agile development

27 February 2020 13:45–14:30

Training Room 1

We live in a world where we never hear about failures in a positive light, only the success stories. Our education system, work performance metrics, even social media glamorizes getting the "correct" answer the first time, completely discounting the trial & error before that leads to the eventual success.

While technology is as "cheap" as the hours it takes to write code and the bar is low, we are still terrified to fail and it keeps many of us from trying anything at all. This fear of trying stifles any chance of innovation we may have. How can we become unafraid to try again?

## The trygve programming language: real Object-Oriented Programming

28 February 2020 13:30–14:15

Conference Room 2

Few "object-oriented programmers" program in objects most program in classes. While classes are great for organizing domain knowledge, their structure does not express the dynamics of how object-oriented programs behave. Object orientation was originally conceived as supporting interaction between a network of cooperating objects; such networks are the building blocks of the human mental models of how computer-orchestrated processing takes place. Yet polymorphism makes it impossible to reason about the structure or behavior of such networks from source code. By contextualizing execution in reasonably-sized networks of objects that enact use cases, and by expressing the code in terms of interacting behaviors with more powerful forms of polymorphic binding, the Data, Context and Interaction (DCI) Paradigm makes it possible to create object-programs that reflect the mental models of human users and programmers. This talk will introduce DCI by way of the trygve programming language.



CHRIS SAINTY

## Building next generation web apps with Blazor

27 February 2020 14:30–15:15

Main Auditorium

The widespread adoption of WebAssembly, by all major browsers, has opened the world of front-end development to languages other than JavaScript. The platform leading the charge is Blazor - a new client-side UI framework from the Microsoft ASP.NET team. Blazor allows developers to write client-side applications using C# which runs inside the browser without needing plugins or transpilation - how cool is that!

In this code-focused session, we'll explore the Blazor platform. We'll start by looking at fundamentals such as how to structure Blazor applications for flexibility. The component model, looking at life cycle methods and inter-component communication, as well as forms and validation. We'll then explore some more advanced topics such as authentication, authorisation and JavaScript interop.

This session is great for developers both new to Blazor or who have prior experience and want to deepen their knowledge.



KATJA MORDAUNT

## Healthy code, happy people (an introduction to Elm)

27 February 2020 14:30–15:15

Conference Room 2

Javascript on its own has proven to be too flexible. We're human, good at making unnecessarily complicated systems. React is great, but it's hard for newcomers and was designed to solve specific problems. Vue, Angular and others have also been helpful, and now that we have typescript, babel, webpack, graphql, etc - browser runnable code is getting cleaner and safer to write. But too many libraries and bolt-ons encourage mess; a lot of the tooling is there because we have to tidy up. Maybe the building blocks are wrong, maybe html and css and js are too hard for us to reason in...



RUSSEL WINDER

## Rustaceans are not members of a Cargo cult

28 February 2020 10:45–11:30

Conference Room 2

JIM MARSHALL

## How to build & manage high performing teams

28 February 2020 10:45–11:30

Training Room 1



CHARLI VINCE



DOM DAVIS

## Why I was bad at sketchbooks: imposter syndrome and letting go of perfection

28 February 2020 11:30–12:15

Main Auditorium

Looking at the importance of experimentation and fighting the impending imposter syndrome goblins and anxiety monsters that comes with it. Charli Vince, Norwich illustrator and speaker on all things creative, probes into the way getting comfortable with the “sketchbook mentality” has helped her start to defeat these adversaries and the boosts it’s given her work flow, confidence, and problem solving abilities.

DANI PAPAMAXIMOU

## Nice words butter, but no parsnip; or how to use game theory to understand company politics

28 February 2020 11:30–12:15

Conference Room 2

## The story of the code

28 February 2020 13:30–14:15

Main Auditorium

All too often we treat code as some reified source of truth. Don’t understand what’s going on? Use the source, Luke! Except that only tells us the how. The why can often be hidden, and sometimes even lost entirely. Without the why it can be hard to discern why decisions were made, and the full context behind what’s going on.

Through the use of practical examples, this session aims to look at the wider story of the code, what we can do to tell that story, and more importantly what we can do to preserve the story. Because ultimately when your code is unearthed in several years time you want people to say “ah, OK” rather than “WTF?!“

## Concurrency in Go

28 February 2020 15:15–16:00

Conference Room 2

One of the major features of Go is its lightweight concurrency model and the ease in which concurrency can be handled. Go embraces the philosophy of “Do not communicate by sharing memory; instead, share memory by communicating”. In this session we’ll look at how Go handles concurrency, and how goroutines and channels can be utilised to create complex concurrent patterns in very few lines of code. With plenty of live coding examples we’ll explore some different techniques, how they apply to the real world, and how we can break out of the constraints that the shared memory multi-threading model imposes. Go knowledge isn’t required, but an understanding of C-like languages would be useful.



FEDERICA FREDDI



PAUL PALIK

## Computer vision workshop

28 February 2020 13:30–15:00

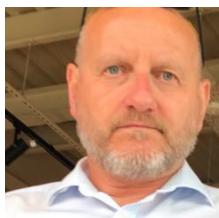
Board Room

## Tech contracts: what could possibly go wrong?!

28 February 2020 14:15–15:00

Training Room 1

A practical interactive look at what can go wrong in technology agreements including who owns your software, contractual “must haves”, fine print in boilerplates, the Kremlin and zombies. This session will help you read and review your contracts.



BRIAN BUSH



NICHOLAS WALSH

## What's the point of being mentored?

28 February 2020 13:30–14:15

Training Room 1

As your business grows how do you know when you need help? And more importantly how do you know who to get help from?

Coaches, mentors, consultants and non exec directors. Which, why, how, who and when will all be discussed in this session. As well as talking about my Brian's experience in this space we can chat through your thoughts and experiences too.

## Better mental health and wellbeing literacy for developers

28 February 2020 15:15–16:00

Main Auditorium

Recent surveys have reported that 66% of tech workers report feeling stressed by their work; 52% have suffered from anxiety and depression; and tech workers are 5x more depressed than the UK population. Findings are especially pronounced for neurodivergent groups (diagnosed with dyslexia, dyspraxia, ADHD, Autism etc.). In this talk I will provide an overview of current thinking on mental health and wellbeing based on contemporary research. This will cover how mental health phenomena is conceptualised, assessed, classified, caused, treated and the underlying brain mechanisms. I will also outline some general steps that individuals can take to improve their own wellbeing for themselves and their organisations. By increasing mental health literacy, I hope individuals will be better informed to create a more enjoyable and productive working environment.



ADAM McCANN

## How to get 33% of your software development costs back with R&D tax credits

28 February 2020 15:15–16:00

Training Room 1

Does your company develop software in-house? If so, you may be eligible for HMRC's R&D tax credit scheme. In this session Adam McCann from Claimer explores how you can check your eligibility, and what you need to do to make a claim.



JAMES SECONDE

## The politics of tool shaming

28 February 2020 16:00–16:45

Main Auditorium

We've all heard it: "What?! You're using X framework/language/tool? You must suck at programming!"

We work in jobs rife with debate and discussion, where it's essential to give and take advice; some good, some bad. In this talk I'll delve into what's harmful about shaming, what's constructive and how we need to think about what we want for our future as an industry.



KIERA LAVINGTON

## SEO workshop

28 February 2020 15:15–16:45

Board Room



ADRIAN PICKERING



KITTY ROSSER

## How to become an AI-driven enterprise

28 February 2020 16:00–16:45

Conference Room 2

The rise of artificial intelligence is presenting new opportunities and efficiencies to organisations. But is a growing divide of AI Haves and AI Have Nots posing a threat to late adopters and what can they do to catch up? A global skills shortage has seen Data Scientist labelled as the sexiest, and one of the best paid jobs in the business of software.

What are the pitfalls in becoming an AI-driven enterprise? Why do 90% of machine learning projects end in the lab? How long does it take to productionise models?

In this talk, aimed at executives, managers and analysts, I will try to navigate the perilous waters that have sunk data science programmes and offer some practical ideas to boost your chances of success.

## How to manage a data breach

28 February 2020 16:00–16:45

Training Room 1

In the year before GDPR came into being 3,300 data breaches were reported to the ICO. In the first year after GDPR took effect, 14,000 breaches were reported. 2019 saw British Airways fined £183 million for a data breach by the ICO and a raft of cases in the UK and European courts have set new precedents extending the boundaries of liability for breach cases. Data risk is on every boardroom agenda but surprisingly few organisations are able to explain how they would go about handling a breach in practice. During this session we will walk you through how to recognise and deal with a data breach, offering you some practical tips and honest insights into the risks posed by breaches along the way.

## // Article

# Train wreck



// ARTICLE  
DOM DAVIS

**“**We live in a world where there are frequent failures on our rail network. This is, in part, due to the fast and huge, distributed electro-mechanical system that's exposed to the elements, and, in part, due to chronic underfunding.

The UK has had a long relationship with rail transport. It started in 1829 with Stephenson's Rocket, and quickly expanded into a rail network that was the envy of the world. 190 years later you'd think any problems with our trains would be solved.. They're not. We live in a world where there are frequent failures on our rail network. This is, in part, due to the fast and huge, distributed electro-mechanical system that's exposed to the elements, and, in part, due to chronic underfunding.

## FLIRT

The FLIRT 755 introduced something new onto my commute: software failure. I'm no stranger to software messing up my plans. The aviation industry long ago proved that software can be used to effectively and efficiently destroy the plans of tens of thousands of people at a time. While aviation has gone big, the failures tend to be relatively short lived and infrequent. The rail networks have gone for smaller scale impact, but over an impressive timeframe of nearly a year at the time of writing.

At this point I need to stress that I've not yet managed to find any primary sources of data for the failures we're seeing with the FLIRT 755. Getting to the truth of the matter is difficult. There is a lot of hearsay, conjecture, and speculation, meaning some of my assessment could be entirely wrong. I've already had to edit this article a few times as new information has come to light. If this sounds like how every bit of software ever has been designed then there may be some learning here for you.

## When rolling stock doesn't roll

The rolling stock on my network was, until recently, formed of units from last millennium. The oldest being the Mark 3 intercity carriages that form the route from Norwich to London. Manufacture of these units started when I was born, over 4 decades ago, and despite refurbishment and modernisation the underlying chassis limits what can be

done in some areas. It's why these units still have the old fashioned "lean out and open" manual doors.

The trains on my line were slightly newer than this, although some of them were still over 30 years old. Understandably they were showing signs of age. Being slightly more modern these units had some creature comforts, like automatic doors. Exactly how these doors worked is unknown to me, but given the age of the units I'm guessing they're primarily electromechanical with little or no software involved.

## Mind the gap

Operation of the doors involved a large "key" which the guard would use to open a panel and then arm the door buttons. They could then make the passenger door buttons active, optionally locking out any doors behind them. This last feature was important for platforms that were shorter than the train. The guard would ensure only doors aligned with a platform would open.

## Direction of travel

This old-school technology was due to be replaced in January 2019 with the rollout of state-of-the-art FLIRT units. This did not happen, and it wasn't long until rumours of software failure began to surface. There were unsubstantiated claims of the units going the wrong way, which is impressive since you have a choice of two directions on a train, but the persistent issue that kept cropping up was the doors didn't work properly. Regardless of the actual cause, we've now got a delayed deployment to production due to software issues. This is a story I know well; I've seen it many times.

The narrative actually begins well before this, with the decision by Greater Anglia to replace their entire ageing fleet with FLIRT units. This kicked off a project that had a number of moving parts, of which delivery of working software was only one. Given the amount of money involved, the pressure

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And then a train blew through a level crossing that was still open and came within a gnat's whisker of taking out a car.

to deliver software on time will have been huge, and the desire to hear about problems non-existent. Deadlines had been set; delivery dates must be met.

What this means is that any issues with the software will have been downplayed. Assurances would have been given that the deadlines were fine, despite the software developers knowing they'd be missed. Builds that the developers had little real confidence in will have been shipped. Obviously, I wasn't there, so I can't know this for a fact, but I've worked on large projects. To not have this outcome would be atypical.

Meanwhile the rest of the process will have gone ahead unabated. The first units were delivered on time, and since there was no indication of trouble, plans for divesting the old fleet continued apace. And then the trains didn't work. Which meant there was nothing to replace the old rolling stock that was being offloaded. This actually made things worse than if the issue with the software had been brought to the fore earlier.

Instead of months of simply continuing with the old rolling stock, which, while ageing, still actually mostly worked, we were faced with months of short formation trains as units were split to make up shortfalls. Trains were delayed. Trains were cancelled. Commuters were unhappy. All thanks to software that hadn't even entered service yet.

And when the new rolling stock finally did make it out, we got different units to the ones we were expecting. 4 carriages, not 3. This has made for nice empty trains, so we're definitely not complaining, but it also provides an interesting hint towards at least one of the problems.

### The crux of the matter

This old-school technology was due to be replaced in FLIRT 755 carriages has a single door on each side (as opposed to the more usual arrangement of two per side on older rolling stock). These doors are not in the middle, so formations with an odd number of carriages are asymmetric. This means the first 3 doors on the 4 carriage trains are closer together than the 3 doors on a 3 carriage train.

So we have rumours of software problems, rumours the trains are too long, rumours the guards can't lock out doors like they used to, and the eventual deployment of a new train type with a different door configuration. Perhaps the 4 carriage trains somehow fit with 3 of their doors, while the 3 carriage units don't.

Except I'm writing this on a 3-carriage train, and all 3 doors

opened when I got on it. OK, so the nose of the train had to overshoot the platform a bit, but then the 4 carriage units had been doing that by even more when we had those. So, the issue with the doors is something else. There's information here we're not privy to that is making the solution less trivial than it might otherwise sound. This complexity could be regulatory, environmental, poor design, or all three. That the trains have been nicknamed Basil's (as in Basil Fawlty - faulty) points to the latter.

For example, there are rumours that one line can't run its new units because they can't make the trip on a single tank of fuel. This would seem like an oversight, until you learn that there may be issues with the software handling the pantographs so what was meant to be a bi-mode journey could now be entirely single mode, and that the trains have smaller fuel tanks than original design due to weight problems. Either one of those could mean a requirement that was originally met in the planning phase is no longer met in production.

Thankfully, that issue doesn't affect me, and once we had our shiny new, 4 carriage units with air-conditioning, wifi, and the ability to make up delays simply by accelerating harder and going faster, I thought that would be it for my interest in the new units.

And then a train blew through a level crossing that was still open and came within a gnat's whisker of taking out a car. A situation I think we can all agree we'd like to avoid. Trains have right of way at level crossings - and I don't care what the law says, physics has my back here. Wikipedia has this on the incident:

"On 24 November 2019, a unit of the class was approaching a level crossing at Thorpe End, Norfolk at 45 miles per hour (72 km/h) when the barriers lifted as the train was 220 yards (200 m) from the crossing and cars started crossing in front of the train. Despite emergency braking, the train was unable to stop before the crossing. A collision was avoided by a quarter of a second."

The incident was blamed on contaminants on the wheels interfering with the track detection system. Which to my mind means that we've got a network wide problem with the entire replacement fleet. Instead we had a problem on a single line which was solved by something straight out of the 19th century playbook: A person with a flag. At every crossing. The train approaches at 20mph, checks the person is waving the green flag to indicate the crossing is safe, and continues over the crossing. This has a knock-on effect. Every journey now takes 20 minutes longer. Trains are cancelled because units and staff are in the wrong place. And because the

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Instead we had a problem on a single line which was solved by something straight out of the 19th century playbook: A person with a flag. At every crossing.

monitoring stations are not getting updates on where the trains are, the software doesn't know where the trains are either. So, we end up in the situation where trains are listed as running on time, when they're not.

Not only are these trains not running on time, there is no way the train can run at all. The software happily goes through a fallback mechanism that just adds a minutes worth of delay as every minute ticks by, and eventually, when some hidden threshold is reached, silently drops the train off the information list. Not a problem at larger stations, staff can make tannoy announcements and keep everyone up to date. At my rural station, however, we only discover it is cancelled when the train running in the opposite direction on the single-track line turns up. And then we find out there was never a train to form the expected service in the first place. To my mind this train was cancelled, but the software defaults to running on time.

We've also seen the train marked as cancelled, only to turn up at the station. Even the conductor of that service didn't know it was running until he actually got on it, which doesn't instil confidence. The latest in the saga appears to be having the train listed as on time in the app, but not listed at all on the information boards at the station. To go with our flag wielding people in place of signals, we're also utilising a distinctly 19th century system of only knowing when and if the train is running by its presence in the station.

But why only my line? Turns out there's more to the story. Apparently, the signalling system on my line is different to those on other lines. If rumours are to be believed it is "5 times more complex than it needs to be", although that is likely just hyperbole for "it could be simpler".

Great, but why wasn't this picked up in testing? That may be as simple as leaves on the line. Testing of these units was done from early 2019 onwards when leaf fall wouldn't have been an issue. The incident happened later in the year, where leaves, or the systems put in place to combat their effect, could have had an influence on the situation. Turns out production wasn't the same as test, despite the tests running on the production hardware. And while this all may seem utterly bonkers, just consider that it's a massively complex system cobbled together over 2 centuries and currently built and maintained by the lowest bidder. That it works at all is a miracle. Now consider what other important things in life are like this: air transport, the NHS, our nuclear deterrent. Sleep well...

*Dom Davis is a software developer who has been on a decades long, award winning twitter campaign to name and shame the problems with our rail network. This likely identifies him as a Grumpy Old Man.*

## // Article



// ARTICLE  
ADRIAN PICKERING

# Ramblings on how micro services are shaping the future of SQL

Base Ten is hardly a convenient foundation for how we think about numbers. It is divisible only by 1, 2, 5 and itself. Base Twelve would give us 1, 2, 3, 4, 6 and 12 for segmentation and who doesn't love a clock? A quarter past eleven. Try that with your metric 10-hour day. The revolutionary French gave it a bash in 1793<sup>1</sup> but it didn't withstand the test of time.

Base Two, native to essentially all computers, allows any number to be represented using just two different characters, 0 and 1. What is more, Base Two lends itself to easier mental arithmetic, or at least it would if we spent half as much effort indoctrinating children in the joys of binary as we do in decimal. How about base 5? No more seven times table, that's got to be of benefit to the sanity of world order.

Yet we stick with Base Ten. Zero to nine, carry a one. Base ten served us well when our imaginations hadn't offered us a more sophisticated abacus than counting on our fingers, but even base two would have allowed us to hit 1023 before reaching down to our toes.

Our broad preference for decimal<sup>2</sup> may or may not have impeded science on this planet, but I can confidently assert that, in hindsight, we probably wouldn't choose it again if we had all of human history to play with. In spite of this, human achievement that depends heavily on mathematics, in the form of scientific and technological advancement, is truly astonishing, and give or take a few morsels, all of that was performed on top of Base Ten thinking.

### We may forever be condemned to build for new problems on top of solutions to old problems, long after those old problems have gone away.

Some technologies are burdened by others' legacies, their ancestors solving long-since obsolete problems. The relational database management systems (RDBMS) that power the world nostalgically cling to practices designed to solve a problem that doesn't really exist anymore: efficiently storing and retrieving data from platters of spinning disks of rust by moving tiny magnets as little as possible.

Storage is now cheap and solid state drives reduce the funding purpose of RDMBS to extinction. However, the side effect of years of investment into database technologies - indexing, partitioning, query languages and much more - is a very efficient means of storing and retrieving highly-structured data. The practices and techniques for exercising



these technologies are well understood and exploited to great effect.

Enterprises will want RDMBS for decades to come, where the effort in shaping and structuring data more than pays for itself when the returns in processing efficiency are delivered. Smaller organisations, who may value time to market and low-cost staff, broadly have no good reason not to go NoSQL and abandon the RDBMS altogether. Micro services each demand exclusive storage.

Document stores (Couchbase), key value stores (Dynamo), graph databases (Neo4J) and column stores (Cassandra) are so easy for the application programmer to work with and they don't need to worry about n degrees of Normal Form. Concerns of referential integrity - which matter no less than they ever did - are pushed up the stack and become the responsibility of the hosting micro service. Data is replicated but it kind-of doesn't matter as the consumer of the data (the application programmer) makes the judgement on which source is most worthy.

### The relationships valued in RDBMS are considered harmful across micro service boundaries

Micro services are a great way to deliver working software. Isolated, free of coupling at the point of testing and deployment, you can make highly robust solutions very quickly, prove them and deploy them. A problem comes

1 <https://www.mentalfloss.com/article/32127/decimal-time-how-french-made-10-hour-day> At the height of the Revolution, France operated within a decimal time system, with 10 hour days, 100 minute hours and 100 seconds each minute. It wasn't a great success and was abandoned after a few days. Someone tried again in 1799 and it didn't do much better then.

2 The late Babylonians loved Base Sixty. I bet they were never late for anything.

with the plumbing: the concern over which data in a conflict “wins” is pushed back up to the application.

A number of modern enterprises, particularly in the B2C space, may work towards “customer-centric architecture”. That means there’s a customer service and anything that needs to know about a customer consumes that service. You have a customer payment service that looks after the payments a customer has made. It consumes (only - does not extend) the customer service, and offers its own functionality too.

This is mostly a neat fit with SOLID, extensible architecture too - each service is a black box, like using Google or Facebook authentication on your own website - and in return that service promises to never change. By change, I mean it may be extended, but given the same request, the behaviour is consistent. This is in line with the open-closed principle and, logically if not literally, the Liskov substitution principle.

**Transactional processing is hard nut to crack in micro services. Logical transactions essentially don’t exist, at least they bring complications and the solutions are often not that robust. Each micro service needs to be instructed to reverse the consequence of an action and this is all orchestrated by the consuming application.**

I have heard people say monolithic architecture is coming back, I’m not sure it went away, though I suspect micro services are a long way from peaking.

My pet theory - much of what we (as makers of software) do is pretty much boilerplate: the same stuff, more or less, over and over again. Bit by bit, much of the functionality will be replaced by micro services. Google, Microsoft and Facebook authentication are great examples. Why would I want to write my own Auth solution?

Traditional RDMBS *n*-tier thinking, as opposed to micro service architecture, lends itself to efficiency of data more than it does to horizontal scalability. Micro services and NoSQL solutions are quick to build and cheap to maintain. Finding the balance is where science meets art.

The thing is, programming is fast becoming the new literacy. In Roman times, through and past the Middle Ages, those few who could read and write had a huge advantage over the plebeians and peasants. In the coming generation or so, everyone will be a programmer. It will be as normal a part of professional life as Excel, and, like Excel, 99% of users will get enough out of 1% of its functionality. Still, where there lies an advantage in efficiency of product over speed to market, the older database technologies will still be favoured. Big business will want *Oracle* until we retire and beyond; such jobs will likely become more scarce and, possibly, higher paid.

**The legacy of Base Ten shall doubtless outlive me by some years or perhaps millennia, and although I do not expect the humble RDMBS to survive for quite that long, it will not be disappearing any time soon.**

*Title Picture By Peter Hamer - Ken Thompson (sitting) and Dennis Ritchie at PDP-11 Uploaded by Magnus Manske, CC BY-SA 2.0, <https://commons.wikimedia.org/w/index.php?curid=24512134>*

## // Sponsored article



# Snoop

## Using the power of Open Banking a group of former Virgin Money executives are developing Snoop, a Norwich-based start-up aiming to put billions of pounds back in consumers' pockets

Consumers are losing out by at least £12 billion a year by not switching to better deals. The average consumer spends £900 more a year than they earn. And less than half of consumers are confident making financial decisions.

Snoop is aiming to change that, put people in control of their financial data, help them avoid rip-offs and make them better off by spending smarter, saving smarter and ultimately living smarter.

Innovative solutions like Snoop are being enabled by Open Banking – an initiative mandated and introduced by the Competition and Markets Authority (CMA) to improve competition and innovation in retail banking.

Open Banking is a secure technology framework that allows Snoop to connect to your bank accounts and credit cards under a consent model which you control, and unlike screen-scraping, we never need to see your login details. Once connected, Snoop will then use a smart combination of artificial and human intelligence to pinpoint ways to save money at the places you already spend.

Everything is being designed to give consumers control and convenience, improve their banking experience and help them make more of their money.

Powered by secure APIs, Open Banking enables consumers to take back control of their data. Open Banking is as safe as online banking and banks in the UK are now required, by law, to provide this information in order to drive better outcomes for consumers.

It's also fully regulated, Snoop gained regulatory approval in November 2019, and access to APIs is restricted only to regulated third party providers that have been subject to extensive verification of their security, operational governance and risk management controls.

Ultimately consumers choose which apps & businesses they want to use, what information they can access, and for how long. No one gets access unless you say so – the customer is always in charge. That's the beauty of it.

At Snoop we are excited about the potential for Open Banking and there are myriad use cases. New services will help with money management and financial decision making. Financial confidence, capability and wellbeing. Credit use

and over-indebtedness. Saving and retirement planning. Open Banking is the most consequential regulation to affect the banking sector in recent times. It will make competition for customers a reality and unleash a wave of innovation that genuinely puts the customer in charge of their data and life.

Currently it feels like banking's best kept secret and it really shouldn't be!

We believe that Banking is in desperate need of a gamechanger and that's what Snoop is gunning for with a rich combination of the best capability of the new neo-banks, proactive price comparison, switching and personal financial management – all in one easy to use app.

As a founding team we initially thought long and hard about creating a bank from scratch. We decided against it because we wanted to be 100% independent and serve only in the best interests of our customers. A bank will never do that, but Snoop can and will as an ultimate consumer champion. Although we are only at the beginning of the Open Banking roadmap, the entire financial industry will open up to its customers through APIs that facilitate the exchange of information and data.

Why? Because it is increasingly a mainstream choice and demand is growing quickly for one simple reason: Open Banking is banking – just better.

At Snoop we've got off to a flying start with thousands of people signed up for early access to the first version of Snoop.

Having started the business in April 2019, we've been building out our cloud native platform and native iOS and Android apps and now we're currently preparing the ground for our closed user group beta before rolling out the app to everyone and can't wait to start helping people take back control of their money and claw back the billions lost to bad deals.

### Jem Walters, Chief Technology Officer at Snoop

For more information about Snoop, please visit:

<https://www.snoop.app>

For more information on Open Banking please visit:

<https://www.openbanking.org.uk>

## // Meet the community

# Interview Steven Beresford



// INTERVIEW  
STEVEN BERESFORD

**“ I didn’t have the experience working as a developer so was unable to get a development role with Rockstar Games**

**Steven Beresford is a 24 year old who happens to be pretty decent in front of a computer. Steven is a junior software developer. His work experience is similar to many young people trying to get into the tech industry. It’s not always plain sailing.**

### Education

In a bid to learn more about software and garner an education, Steven spent four years studying Computer Science at the University of Essex. This course was made up of a foundation year and then a further three years. During the foundation year the basics were taught to get everyone up to the same level. In the first year, the focus was database handling and coding websites. The second year was taking the first year's topics and going into more detail, it also had modules like game programming, which included elements of AI and games themselves etc. The final year consisted mostly of application of all the things previously learnt. This course allowed students to pick more specific modules so they could narrow down their learning. For his dissertation Steven created an 80s arcade game that was played over a network so users could play other people.

### Experience

With a degree under his belt, Steven graduated university and went straight into working as a Games Tester at Rockstar Games. Steven explained, “The work entailed chasing bugs and then handing those over to the development team with snippets of code. I worked a lot of hours especially in the months before Red Dead 2 was released (great game by the way...) and even afterwards. It was challenging and pressurised and I enjoyed it massively. Unfortunately, I didn't have the experience working as a developer and was therefore not able to successfully apply for a development role within Rockstar Games. I spent just over a year working there before heading back to Norwich.” Steven's home town was our ‘fine city.’

### Problems getting work

Talking about the difficulties of getting a foot in the workplace, Steven said, “A lot of the companies that I've applied to in the

past required so much experience for their Junior positions that it's almost impossible to get a foot in the door. I can appreciate that many places do want someone who can hit the ground running, especially if it's to fulfil a specific project but it reduces the opportunity for learning. I was verbally offered a job in Norwich, but after leaving Rockstar I was contacted and told that as a project had fallen through, they couldn't take me on. These things happen!”

While Steven can appreciate that some companies may need someone, who is extremely experienced, immediately due to project needs, he adds “it's hard to then gain that experience if places aren't willing to teach new recruits.”

### Current role

Steven is currently a Junior Software Developer at a large family run company just outside Norwich. Steven described his role as part of a small team. “We make applications for pretty much every team in the company. This essentially means every application used by any team (warehouse staff, HR, shop floor, finance etc.) is built by the development team. User testing is a real part of the position, as it should be with any sort of role. I really enjoy building applications for real people and getting them to review and give feedback so I can make sure it's as useful as possible for them. It's always nice to go into the warehouse and see colleagues using what I've built - it's a really good feeling of accomplishment.

When talking about his future, Steven is optimistic, “The dream is to get back in the games industry, but at the moment I'm really enjoying learning at work and then doing a bit more individual learning when I get back home. I also spend a fair amount of time at home playing Untitled Goose Game... I would highly recommend it”.

### Networking helps

In a bid to broaden his horizons, Steven has found ways of engaging with the local tech community. “I've also started to go to a few more tech meet-up events in the city. I went to RollUp last year and a SyncNorwich event called Lets Sync A Few which I think was great. I was also thinking of taking part in Sync The City next year after seeing how great it looked, I don't drink coffee but maybe if I take part I'll need to...”

## // Meet the community

Interview  
James Russell

// INTERVIEW  
JAMES RUSSELL  
: BRISK

**“**

We look at six areas of your business, financials, your staff, your operations, your compliance, your security and your reputation. We'll also monitor the health of your website and look out for any potential security breaches.

**James Russell is the CEO and founder of Brisk, but has formerly run a small business and has the desire to modernise the way in which small businesses are protected.**

### A fit-bit for business

Having worked at Aviva for 10 years as Head of Claims and then Programme Director, James Russell understands the needs of SMEs. Established in 2018 Brisk is an innovative AI tool that is targeted at small businesses and start-ups, those that don't necessarily have the same resources as big companies. James realised that offering the combined assets of technology and data, would make the business owner more aware of the risks and opportunities that could affect their companies.

### When were you founded?

We were part of an incubation project, in a start-up accelerator at Founders Factory. We only registered as a company in 2018.

### What is Brisk?

To put it simply, Brisk is a "AI powered risk management screening for SMEs, bringing in data from numerous sources covering everything from compliance to reputation; security to financial information." By providing a tailored tool SMEs will have greater access to tailored products, and not have to be satisfied with the one size fits all approach offered by the larger brokers and industry giants.

Any business signed up to Brisk is getting a risk management tool. James explained that, "all you'll have to enter is your company name, the app will harvest the rest of your information, including checking for data breaches, pulling in credit information, analysing social media reviews and building a 360 view of your business. We look at six areas of your business, financials, your staff, your operations,

your compliance, your security and your reputation. We'll also monitor the health of your website and look out for any potential security breaches." Actions will be suggested through the app.

The AI takes all of the data and then predicts what risks a client is likely to have and what type of insurance policy should be put in place. "The AI piece is looking at big data sets and performs an analysis – a bit like a glorified propensity model.

### What led you to establish Brisk?

"During my time at Aviva I saw that a lot of resource and attention gets given to big business and they also have the capacity to seize risk management opportunities. Small business owners don't have the same access to the same resources. We wanted to use the increasing availability of data and technology to help the busy business owner to become more aware of the risks and opportunities, stay safe, and be more resilient. We felt this would be a powerful service"

"We believed people buy insurance because it's essential, then the policy just sits in a filing cabinet somewhere and people don't really think about it." James saw a gap in the market. Brisk also insures SME's against cyber-attack, which in turn helps small firms improve their credit worthiness. During Brisk's research phase one business said that having this type of protection was almost like, "having a kite mark, a quality accreditation." This improves a smaller company's chances of securing a loan or getting a better quote on their insurance.

### What inspired you to start Brisk?

"I felt that there was a real opportunity to provide a product that would protect people and assets." As James explained, "we are working with core insurers and, all of them are interested in the concept of Brisk." The app is helping the large insurers understand that some smaller companies might be a better risk than they thought, this leads to discounts and incentives for the company."

## // Meet the community

“

James realised that offering the combined assets of technology and data, would make the business owner more aware of the risks and opportunities that could affect their companies.

Another benefit of the Brisk app means that companies will be asked fewer questions and won't be burdened by filling out lots of forms. Insurance actuaries were nervous with this until they understood that by using AI and data together the app will help them record more accurate and current details about the client, therefore offering a more competitive deal.

### Do you have competitors?

The Brisk app is a new way of doing things. James believes that, “most of our competitors are still asking the consumer to visit their website and click to buy the product they want. Of course, this model assumes that the customer is knowledgeable about the insurance market and not all are.” By recognising that many businesses still want the assurance of a broker, “our technology is available to the broker to help them service their clients more efficiently.”

Currently the app is a web-based application, but it can be viewed on a smartphone and it is responsive.

### Where would you like Brisk to be in five years?

As for future plans, in a recent article in *Insurance Post* James explains Brisk has sought Financial Conduct Authority regulatory approval because the company has ambitions to offer insurance to those utilising Brisk technology.

“If we were purely a data provider we would not need to get regulated but the ultimate goal is to offer insurance products direct to businesses, and as an introducer we need to be authorized,” James explained. Brisk is currently working with four insurers and they're all interested in the concept.

“

The app is helping large insurers understand that some smaller companies might be a better risk than they thought, which leads to discounts and incentives for the company

## // Meet the community

# Norfolk news shorts

**Here at nor(DEV): we're always proud to celebrate achievements in the local tech community. Now's the time to raise a cheer and congratulate many very worthy winners.**

### East of England Tech 50

Out of an impressive list of tech firms from our region, Norwich based companies managed to secure 8 places in this annual review of the top 50 tech companies in the East, with Pickl coming an impressive sixth. The list of companies is judged by both the public and a more formal judging panel made up with Thea Goodluck from TechNation, Liz Clayburne, Director of the Norwich-Cambridge Tech Corridor, James Gotz, director of ventures, at business support company, Allia, John Gourd, CEO of Cambridge Network and, Jonathan Symcox, editor, of BusinessCloud.

### Capturing a trend

As an increasing number of people are using Airbnb accommodation for business and leisure purposes. Pickl soon realised that many owners would have problems getting insurance for their properties as short term lets with constantly changing tenants were notoriously difficult to insure. By recognising this, the company set up as a specialist short term insurance broker and embraced the burgeoning sharing economy. By adding Just Park to their portfolio, Pickl was able to bridge a gap overlooked by many other companies in this field. Companies like Pickl are breaking the mold through their innovative business.

### Tech Nation Rising Stars

This prestigious competition is lucky enough to have had Norwich based, digital staffing platform, Pickr among its semi-finalists. Sadly, the company didn't make it through to the finals, but to have achieved this status among some very strong national competition is impressive. But Pickr has been shortlisted for many other awards, including the National Technology Awards. Way to go.

### Other news

More recently, developers from North Norfolk's, Engage Health Systems, gave a presentation at Cardiff's NHS Hack Day in late January. Rupe is the name of a boy suffering from epilepsy and the presentation was named for him. This easy to use and, cost effective system will provide a record of heart rate spikes and dips during the night. The team consisted of Adam Groom with Paul Peacock and Mark Edmunds. Constructed as an Apple watch app, it can provide real time data to assist carers and parents. Big alterations in the heart beat can indicate an epileptic seizure while someone is sleeping, or about to have a seizure during the day. By using a companion app on a smartphone, Rupe's mother, teachers and carers would always be aware of the boy's seizure record and will be able to respond quickly in an emergency.

Development is set to start "as soon as possible," said Jon Witte, Engage Health System's managing director.

### New developments

With Tech Nation publishing stats showing that the east of England has a digital turnover of £8.33 billion, and Norwich being home to many innovative tech startups and companies, we are a region of tech status and connectivity. UKTechNews (UKTN) published figures in March 2019 that revealed that we are a vibrant region for technology,

The figures show that the East of England growth for start-ups rose by 5%.and, "science and technology firms based in East Anglia secured almost £300m of venture capital investment in quarter two of 2018." In 2020, Norwich's Rainbird CTO, Ben Taylor, has predicted that. "machine intelligence can enable businesses to solve complex problems before they ever reach the customer."

We are a region on the move.

## // Article

# Sharing the knowledge: the Ladies of Norwich Hacking Society

Who doesn't recognise the dark hooded figure in a badly lit room, with the light of the blue screen on their face, tapping out their nefarious plans on the keyboard? With the media, movies and even a slew of documentaries on Netflix now dedicated to the murky world of the dark web and crime on the internet, we all know that character. But that is exactly what it is, a caricature of a person with a set of technical skills, no more.

## The reality

There is not much time and screen space dedicated to the actual hardworking techies who protect computers, networks, websites and humans on a day to day basis. Even fewer hours dedicated to the women who complete these jobs. When I first became interested in the area of information security, I wanted to learn. I went looking for help to get started and I found a few people within the county (Norfolk) who have spent many years working in security. They are excited by their subject, are very generous with their time and their advice and are highly technical. They are rare, and they are all men. This in itself is no issue, but I was left wondering, "Where are all the women?".

## Setting up

In Norfolk there is such a vibrant tech meetup space with so many different subjects covered, so it seemed like a good plan to build a meetup and see if we couldn't get some women all in the same room to talk about these things. If you want to build something new, it's best to learn from those who have smashed it before you, so I went to London to meet Eliza May Austin, the founder of the not-for-profit organisation the Ladies of London Hacking Society (LLHS).

Eliza was passionate about sharing knowledge between women in a technical, male-dominated environment, she had created the hacking society with motivations and ideals similar to my own, and she suggested the creation of the first chapter of the hacking society outside of London, The Ladies of Norwich Hacking Society (LNHS).

## Combatting hacking

LNHS is a woman centric not exclusive meetup that offers an open and supportive learning and networking space. No question is a stupid one, if you don't know the answer, no doubt someone else will and can help. The meetup is open to all, but the values have to be adhered to. No heated competition, no trying to outsmart each other, just support and willingness to both learn and teach.



// ARTICLE  
TASHA HALES

“ They are excited by their subject, generous with their time and advice and highly technical. They are rare, and they are all men. I was left wondering, “Where are all the women?”.

The hacking society events are supported by the cyber industry, but one of the largest contributions is from Immersive Labs, who supply a fantastic platform for LNHS members to use, free of charge. They offer online training using virtual Linux and Windows boxes that allow the practice of offensive and defensive cyber skills in a safe environment. Labs completed since our inception have included using the Social Engineering Toolkit to build a malicious pdf document, active network reconnaissance using tools such as Nmap, and inspecting web traffic packets using Wireshark in order to break into a web app. Coming up in the near future will be sessions on SQL injection, credential cracking and reverse engineering malware. One of the best elements to the labs is the encouragement of curiosity. Many of them use a ‘capture the flag’ approach and instead of spoon-feeding learning allow you the opportunity to explore and research online in the search for those answers.

## Meet the LNHS

On top of the labs, meetups include a guest speaker from industry or academia to share their knowledge. Topics range from every day, front line security and advice, to new and upcoming research. Previous support from guest speakers has included SureCloud, UEA, and a particularly lively session with the Norfolk & Suffolk Police's Joint Cyber Crime Unit who ran an interactive cyber incident exercise... with Lego! There is pizza, something tasty to drink and every meetup is completely free of charge.

Whether you are a software developer who thinks some security knowledge would make a great addition to your skill set, or you are a Linux whizz and want to share some of that super knowledge, you are just curious or perhaps already a CISO, LNHS would love to have you. All events are on our meetup page: <https://www.meetup.com/LNHS-Ladies-Of-Norwich-Hacking-Society/> so please come and join us, bring a laptop, get stuck in and learn. No previous technical knowledge required, all sessions are accessible to all levels.

Tasha Hales is a computing lecturer at City College, Norwich, specialising in cyber-security. Tasha is also chapter lead of the LNHS.



# IJYI



"THE HARDER YOUR NAME IS TO REMEMBER,  
THE HARDER IT IS TO FORGET"

Arnold Schwarzenegger



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## // Sponsored article



# From start-up to scale-up: the IJYI team share their journey

"So, how do you pronounce your company name?"

"ee-jj-ee as in e.g. Because we always want our work to be an example of how software delivery should work"

"Oh, I get it!"

This is often how conversations with new customers, partners, and employees begin. The name IJYI is certainly unusual and always sparks conversation. This pretty much reflects IJYI as a company. We're not your average software house. In September 2019 we celebrated IJYI's 5th year in business so we decided to take a look at those five years and share our journey with you.

### Where it all began

IJYI was born in 2014 when industry experts Chris Pont and John Nicholson came together with the joint vision to improve software delivery processes and outcomes for organisations across the UK and beyond.

But more specifically, in a tiny office in the centre of Ipswich (with really bad carpet) is where it all began. Shortly after they moved into their office Chris and John took on their first employee, Inky Simmons, who went on to become an integral member of the team.

### The challenges of a start-up

Anyone who has been involved in a start-up will know that those first few years can be a pretty wild ride. Like most start-ups the team faced a dazzling array of challenges from the relatively small:

*"Being the Co-Founder of a start-up definitely isn't all glamour, I vividly remember having to deal with plumbing issues in a leaky toilet in our first office!"* **Says Chris Pont, IJYI CEO and Co-Founder.**

As it turns out Facilities Management seemed to take up rather a lot of time in the early days with aircon issues, building office desks and struggling to fit in kitchen appliances to keep everyone's coffee habits catered for!

To the bigger challenges - A mistake that many start-ups make is simply saying yes to everything. It's understandable in those early years, as much as you have a vision of the work you want to be doing, the reality is that you need to pay the bills and keep your staff in work. IJYI occasionally fell into that trap taking on everything possible. Building a business comes with a steep learning curve and John and

Chris realised that the best way to build the business that they wanted was to focus on their competencies. This is exactly what they did and with fearless determination, hard work and commitment (plus plenty of coffee) they solidified their team and concentrated on providing excellent software delivery services.

*"Over the last five years we've developed not just as an organisation but individually as managers and it's made us the organisation that we are today."* **John Nicholson, CTO, IJYI**

### Looking ahead to the new decade at home and beyond

The last 12 months have been extremely busy for IJYI and the team has expanded dramatically with new staff joining in Business Analysis, Project Management, Business Development and Technical roles. As the team take on larger and more complex projects from both new and existing customers 2020 is shaping up to be a big year for IJYI.

Looking outward we're also really excited to see what the future holds for the tech industry in the East of England. IJYI are proud to be part of this dynamic community.

*"The tech industry in the East of England is without a doubt growing rapidly and we're hugely excited to be a part of it,"* **Says Chris Pont, CEO IJYI** "IJYI is committed to supporting the industry in our local area. When we set up IJYI John and I really wanted to be able to provide a great working environment for local tech talent and see people staying in the area rather than taking their skills down to London every day. We have a really strong community here in our region and events such as Nor(DEV):Con are a great way for us all to come together"

### What cool new tech can we look forward to in 2020 and beyond?

For us as developers the developments in Web Assembly and more specifically Blazor are incredibly exciting, they enable fast flow and feed back for developers in languages and tooling that they are used to. We are all looking forward to the talk on Blazor at NorDevcon.

## // Article

# Tom's top tips to get ready for the 2020s



// ARTICLE  
TOM HACZEWSKI

To some, it felt like 2019 was a rough, difficult-to-stomach year. After all, just some of the predictions of the cyborg-filled, nuclear-powered flying car future haven't quite come true, - yet. And, the world seems on the brink of various disasters and crises. Having said that, we have plenty of new technology just around the corner promising to redefine the human experience, and seeing as I'm a movie buff, it turns out I might be more prepared than I thought. Here are my top tips for stuff to watch out for in the next decade, based on what I know from the Sci-fi movies of the 80s. Sorry.

### Getting about

*Transport:* We're about to ditch our old petrol-powered motors and call up a GoogleCab to take us wherever we want to go. It might be a welcome change given our recent disappointing rail service in Norfolk - see also, Dom Davis' article in this very issue of this magazine. Firstly, make sure you turn off the radio when you hop in. In just a few years, if *Demolition Man* is anything to go by, "The Youth" of the 20s will all be listening to radio jingles as entertainment and you really can't listen to the Ocean Finance jingle every time you get into a cab without going insane. Turn that crap off. It's also worth carrying with you some sort of heavy implement, like a cricket bat or block of wood, just in case... After all, when the GoogleCab tries to kidnap you on behalf of a nefarious government, when it starts driving you out into the Fens, you'll want to knock off the head of the robot driver, just like in *Total Recall*.

### Paper has its uses

*UI design:* Make sure you start carrying plenty of plain white paper and sticky tape. Let me explain why. Pretty much every sci-fi film ever made, where things are depicted as super high-tech, includes a whole bunch of transparent glass screens with UI on them. This is obviously, literally, the worst material to build computer screens on because not only is it awful to try and focus on your UI, and not get distracted at things below/behind said screen (like what? Your trousers? A table surface?), but it also means the privacy of what you're working on is basically null. Stick the paper to the back of those screens and voila! Security up, usability improved, and no distractions.

### Intelligence

*AI:* Since we've invited talking databases, robotic vacuums and internet-enabled heating and lighting into our homes, we're ready for the next step - a fully integrated home AI network complete with robotic servants and personalised

security. Remember that when setting up your home's security system, it's wise to avoid over used passwords - such as 'password', 'Joshua', or 'zero zero zero, destruct zero'. You don't want any old starship captain being able to open and shut your curtains at will, do you? And if you're adding new Alexa Skills in the next few years, remember that as AI gets more intelligent it's also becoming more dangerous. Build the Three Laws into your next Teddy Bears' Picnic app, you don't want it getting all stabby and murder on you.

*Jobs:* Seeing as we have all given our DNA away freely with 23and Me testing kits, people are going to know your background far more intimately than you ever thought. Or desired. It's worth getting tested now to see what your genes say you're suitable for. There's no point trying to be a C++ Developer, for example, if your poor genetic material determines you're only suitable for a Javascript role.

Vincent went through a lot to become an astronaut in Gattaca, but to be honest, most of us just aren't going to have those sorts of resources available. Or a disabled-but-genetically-superior pal willing to put their life on hold to help you. At any rate, having paid to give our DNA away, we're likely to all have various clones running around by the end of the 20s anyway.

Perhaps you can buy a couple for yourself and build your own company of duplicates to help you with your project management and QA. I'd also recommend learning some 'soft-skills' that are often spoken about by management types. Think about putting some time into negotiation, team collaboration, and extreme conflict resolution. Sure, learning about HTTP2 and GraphQL are probably useful things to know about but they're not going to be so useful when the inevitable war comes (whether that's aliens from asteroid Apophis in 2029, or from Trump's 'Space Force' going all murderdeathkill in 2024).

### Welcome to Norfolk

Brush up on those driving skills too. When the planet completely dries out from our relentless ambition to kill it through pollutants and emissions, Norfolk will be the first place for Mad-Max-esque car battles - just look at all that flat, endless countryside. You and your tattooed cannibal buddies will be the rulers of the Norfolk Dust Broads.

Good luck out there!

*Tom Haczewski. Founder of The User Story and all round 'good guy.'*

## // Sponsored article



# FXhome: Daring to be different

How did we go from 40,000 to 4.8 million users last decade? Tucked away on St Giles Street, hidden down the cobbled streets of Norwich is a global technology company, providing powerful video editing, VFX and photo editing software to a community of almost 5 million creators.

### Know where you came from

2020 is here, and many companies may be looking back on the past decade (if they've been around that long) and assessing how much progress and impact they made. Some may have formed new investment opportunities, expanded their product line, formed partnerships with industry giants, hired new talent, re-branded or more. FXhome has done it all, but the progress that we're most proud of is with our community.

In recent years, FXhome's community has grown from a tight-knit band of 40,000 to over 4.8 million users that span all creative walks of life. Keeping up with this boom of interest while also staying true to our mission of support, excitement and education has been a difficult challenge to overcome. As we deliver new initiatives to boost our user base, we feel their collective voices behind us, as strong as ever.

### Find the fanatics

FXhome started almost 20 years ago - pre-YouTube, dial up internet, computers barely capable of running video, even if you had the right codec. People who wanted to be filmmakers in 2001 were serious about it, because they had to be. FXhome gave them one of the first online forums dedicated to filmmaking and all things visual effects. Staff and users mingled as equals, slowly increasing numbers as the highly-curated forum filled up with film-obsessed adults and kids alike. At this time, FXhome had to teach how to load videos on basic computer systems, and curate their own mini-cinema to share films.

At the start of the next decade, FXhome started to gain momentum. With the arrival of YouTube into mainstream culture, users could finally share their work easily, as well as their knowledge and opinions. And when the recession hit in 2011, pulling down many small tech companies in a year when FXhome released its first version of HitFilm (our editing & VFX software), FXhome remained afloat, buoyed by its small, but loyal following.

### Stay true to your mission

As our paid-for software become more powerful, expanding into motion graphics, 3D model import and industry-leading

keying, the attention on FXhome grew - but we knew that we wanted to release a product that was truly aligned with our mission and values: one that everyone deserved to access, with powerful creative tools, no matter their budget.

In 2015, we were able to release HitFilm Express - a completely free editor & compositor. Finally there was a product on the market which was simple but powerful, and which meant that anyone could make cool stuff and share it with the world. We harnessed the power of YouTube and started to produce regular tutorials, meaning that our users had fun, educational content to accompany their new download. Over time it has progressed to a product all of its own, bringing in 220,000 weekly subscribed eyes to our content and giving us another way to chat with the most engaged of our followers.

### Understand your users' personal missions

We listen, too. Over the years, we've proven ourselves to be different by providing value year-round with regular updates to our software and by creating a substantial, dedicated community to surround the products.

In January 2020, we launched a brand new initiative, unique in the video software industry, offering users the choice to 'Pay what you want' for the Express software. While the software is still available for free, users have the opportunity to support our development of the free software and in turn, help those who are simply unable to pay for it.

Additionally, we're contributing a percentage of the proceeds of 'Pay What You Want' to organizations dedicated to global causes important to our community.

We have worked hard to make a positive impact on the creators who use our software, but now we're proud to be able to extend that positive impact to the world.

### Hire the best people

While we have an international community, Norfolk is very important to us as a company. We actively support NUA, UEA and local tech groups in a variety of ways including speaking at key events, providing mentorships, offering work experience, internships or sponsoring local events. We also look to recruit local graduates and professionals to join our team. As FXhome's team expands, we will be bringing on more talent and so anyone with web design, software development or VFX experience is welcome to send a CV to [business@fxhome.com](mailto:business@fxhome.com). Come join us.

## // Sync the City

# Transforming the meetup model – fumu



// SYNC THE CITY  
EMILY DELVA

“

Nobody could understand why Meetup would want to monetise attendees, other than to get more money and to splinter the communities built on the site.

I'm going to start with a heavy assumption that a lot of people reading this have at some point... visited meetup.com or maybe Eventbrite? You may even have ventured into the world of Facebook Events (that's unfortunate really, isn't it?). Your visits to these sites reveal that at some stage you've wanted to join in with your local community at a networking event. Meetup alone is used by 25,0000 communities - the demand is there.

### A change is afoot

A couple of months ago, Meetup decided to take a huge step and lay out plans to leave the free market - quite literally. Meetup wanted to monetise these events. Attendees would have to pay even to RSVP. Now, I don't really tend to follow companies' business movements but with this one it was impossible not to. Twitter exploded, Slack channels imploded and the office water cooler started to boil . Nobody could understand why Meetup would want to do this, other than to get more money and to splinter the communities built on the site.

### Revolution starts in Norwich

So in comes Alex Morris, with his 1-minute 2019 Sync The City pitch that hit the hearts (and brains) of pretty much everyone in that hall. An anti-meetup. A tool to build communities and put their needs first, not the needs of the business humans up in their fancy offices with hungry wallets.

Max Elkins, Kev Sturman, Harry Muter, Ilona Utting, Oliver Vince and I joined Alex to try and get that idea built and ready for the Sync The City deadline (lots of coffee and lots of fresh air breaks got us through those days). Couldn't mention the team and not thank Tom Haczewski for being our mentor, it was tough as a lot of teams wanted his expertise but we managed to get really useful and essential pointers from him throughout the exercise.

Firstly, I'd just like to say how incredibly lucky we were to end up with our team - every single individual was so dedicated

and ready to go all in with the idea. We all got on, and it was so much fun to spend 16 or so hours with them in the big hall at Open working away. Let's not talk about the really cold air con shall we?

### A new business model

fumu won't ever charge attendees, it just doesn't make sense to us. Why would you charge someone to click RSVP? Surely that's not the best way to encourage attendance? We went down another route, - a non-charging of attendees route. Superior? We'd say so. We'd be charging other groups and during Sync The City we had confirmation from local businesses and local groups that they'd sign up to this with the prices that Ilona and Alex had built into our business plan. A great start!

Kev and Harry got to work on the backend dev. work, I was genuinely surprised at how much they managed to get done in the time - it blew my mind! So many amazing features have already been built, and our next focus is to define an MVP and then future roadmap so we can be efficient with our development time and make sure we're building things that users actually want and need. We need to build the product to solve problems, not just to be feature rich. For example, fumu will provide insight into attendees attendance records, a regular headache for organisers. Fifty people have signed up to come along to an event, you've booked a hall on the strength of this - only five turn up. fumu will help you assess whether you can hit the bubbly or not.

After Max, Oliver & I had done some ideation, Max (our design whizz) got to work digitising it and making sure it looked as smart as possible. Oliver then worked away on the front end dev work to stitch it all together.

### Moving on

We want to take it forward, we know it's necessary and, we've had so many people come up to us and say it's gotta be done. A few of us have committed more hours than others which we are totally happy with because it then works for



everyone. We still have support from the team. The main issue we have is time.

We're all very busy humans, we're all working (or studying) and the majority of us have hobbies outside of that too. For example, I work full time, train about 7/8 times a week for rowing and like to go to events arranged by groups such as UX Therapy, RollUp, Hot Source and Sync Norwich. My schedule is a bit messy, so trying to get that availability sorted is a bit of a struggle.

### Looking to the future

Now that the Christmas period has left us behind and we're in cold, windy winter, we can try and get things pinned down. Thankfully, everyone in the Norwich tech community is incredibly helpful and I've spoken to so many who were

willing to give great advice. We're hoping to start some formative research in the next few months and I know for a fact that many people would happily volunteer for that (thanks!). Even during Sync The City we had some really useful research done and insights were gathered from so many people (thanks: Joe Glover, Paul Grenyer, Philip Watson, Rich Saunders, Mark Williams-Cook, Alex Scott & Tom Haczewski who all gave their thoughts and opinions readily when asked!).

We may not have won the event, but I can tell you now that we all learnt a lot, had a great time and are determined to make it happen. Formative research can then fuel our design and development - we're ready to get this done!

*Emily Delva is a project manager at the User Story. She has also been known to spend a lot of time underwater.*

“

Meetup alone is used by 25,0000 communities - the demand is there.

## // Sync the City

# Reality Check People's Choice winners

**Yet again, the annual Sync the City selected two fantastic teams as the 2019 winners. We caught up with both teams to see how they're progressing and their plans for the future.**

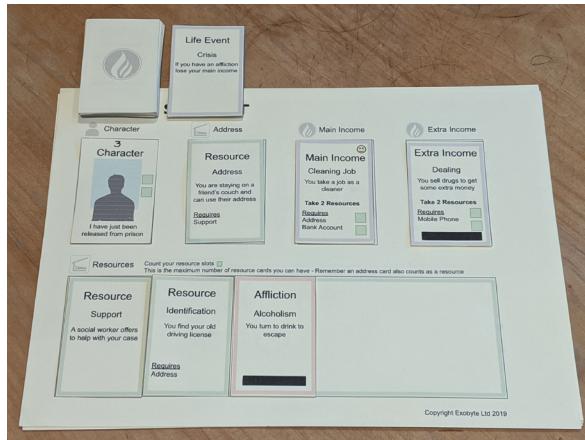
Life is looking good for the 2019 Sync the City Peoples' Choice winning team, Reality Check. Comprised of Nicky King, life skills development co-ordinator at St Martin's Housing Trust, and Richard Woods, founder of games development firm Exobyte, with expert tech and marketing support from Petros, Katherine, Becky, and Alex, the team was awarded £1,000.

### Progress

Following a January 2020 meeting with the UEA, where the team requested a further £2,500 to develop the app, they've been asked to resubmit their quote and ask for more money. Katrina Emmerson, associate dean at the School of Health Sciences has suggested that the team create a more comprehensive app and they are in talks with the UEA about further funding. The team was in communication with Katrina during the progress of Sync the City, where she had volunteered that UEA were keen to offer support. The January meeting highlight's the university's interest in developing the app.

### A game to inform

The concept behind this innovative idea arose from a Hot Source Lightning talk around a discussion about homelessness. Many at the event felt that the perception of homelessness was one of the root problems that lay at the core of the issue.



The initial prototype was devised by Rich as a board game, called, Getting off the Streets, which he gave to the Reality Check team. At Sync the City, the team were able to take the game and the idea further in the shape of an app.

By playing the game you'll encounter a whole variety of scenarios that are faced by the homeless every day. For example, how do you apply for a bank account if you haven't got an address, in which case how do you receive your benefits, or apply for a job? Hurdles are encountered at every stage of the game. The idea is that by playing the game you'll have a far better understanding about what life on the streets entails.

Further good news for the team is that Norwich based solicitors, Leathes Prior have expressed an interest in funding the board game. Reality Check is looking for a local firm to take the board game further.

### The future

Reality Check envisage both the app and the board game as a learning tool for frontline staff. The game has already been trialled with Norfolk Games Developers (NGD) where it sparked lively conversations around the subject of homelessness. The app is still in a very early stage of development but with the promise of funding and UEA involvement, the possibility of the university owning the source code, the app might well become a platform where people can access help and support. .With the expertise of both St Martin's Housing Trust and ExobYTE, and the kick start from Sync the City - this concept will become a reality. As Rich said, "we're really excited about doing something in the Norfolk community and this (app) will help the community."



// Sync the City 

# Little Onion Games

## Sync the City winners

### "Now put the blindfold on"

The 1919 Sync the City winners created an innovative and disruptive app that will allow the blind to game. Little Onion Games walked away as proud winners and received £2,000 as first prize.

Mentored by Aviva's Senior Digital Development Manager, Lisa Price, the team consisted of Roby Cipolletta, Roberta Cipolletta – Creative Director and Narrative Game Designer, Mohammad Musbah Sablouh – Animator and Marketing Manager, James Dornan – Demo Developer, Adam Groom – Demo Developer, Phil McSweeney – Investment Adviser, and Mark Dunmore – accounting and finance.

### Preparation

Working with Norfolk Vision, the local charity for the visually impaired, Little Onion Games set out to create a game that was inclusive and would directly help the world's 285 million visually impaired community. Roby Cipolletta had written her BA dissertation on this subject and was passionate about bringing the thrills of online gaming to the visually impaired marketplace. The app will introduce the wonderful world of horror to all who play it. If sighted players wear a blindfold they will be able to experience the game in the same way as the visually impaired.

### The game

The protagonist is blind and will be trying to sneak through a room, already occupied by a metaphysical monster. There will be obstacles to overcome. By using advanced path generating code and state of the art binaural audio, every

playthrough is unique. As Roby herself says: "The beast is blind, this is important as it personifies the internalised struggle of people grappling with this disability."

### Future plans

Following on from their Sync the City success Little Onion Games do intend to create an app. This takes time and, as members of the team are engaged in work or academic studies, time is a premium. Roby is working as a consultant with Norfolk Vision and plans to incorporate her work on the project as part of her current MA programme at NUA. She also wants to take the work further as the basis for her projected PhD. As Roby's field of interest doesn't currently exist applying to take the PhD will entail sourcing funding and finding an interested academic institute.

Robyn is still operating as a consultant with Norfolk Vision to gain more knowledge and to add to her research. For a fee the charity can also endorse the Little Onion Games' app following testing in the Norfolk Vision studio.

### Building the app

In the immediate future, Roby is working to build a demo app for her Masters' project. Once this is built and approved then the serious business of applying for further funding and looking for investors can begin. As Roby's original dissertation declared, "I feel that a strong case is to be made that creating horror-themed content for those with blindness or visual impairments is not only a remarkable display of the empathy and compassion that we, as humans, can have for one another, but is also a sure-fire way of ensuring the evolution of technology as a whole."



“

Little Onion Games set out to create a game that was inclusive and would directly help the world's 285 million visually impaired community

## // Article

# What is design?



// ARTICLE  
TIM CAYNES

“

The simplest rendition of what I do is: understand people, in order to make better things

I don't know. But I've got 700 words and a bottle of cava to tell you what I think. And that's because in a drunken haze at a Hot Source event in Norwich, I promised to do this. So here we are.

Best to start with a question. What do you do? I'm a designer. What kind of designer? Well...

### What is a designer?

This is what happens when people ask me what I do. I'm pretty much an accidental designer. Which is to say, I ended up with that job title and it's really the sum of many parts, rather than a deliberate career path.

Others are very clear from the outset. Design is what they want to do. And they usually know what they mean by that. I spend a bit of time with the Norwich University of the Arts talking about their design curriculum and what the common methods and practices are across a number of apparently disparate course titles, like graphic design, graphic communication, user experience design, interaction design, game design, design for publishing, etc. If we are to think about the fundamentals of what makes a designer - a designer across the whole spectrum of the practice, we have to start with what a reasonable definition of what design is. I have one.

But it's quite specific to the kind of designer that I am. This is to say, an experienced designer. Or user experience designer. Something like that. I'm not really sure myself.

### Ambiguity dominates

BUT, the simplest rendition of what I do is: understand people, in order to make better things. That's because design in my context is based on divining the holy grail. The tiniest intersection on a venn diagram that describes understanding what users want, understanding what business wants and understanding the viability of a design outcomes, that's what I think the term means. At least, I think it is. As Jared Spool, UX expert at the Centre Center, so eloquently argues, design is the rendering of intent.

I don't really know what that means either, but it's probably his way of saying that as all of us contribute to the design process, we have an acquired skill to enable us to do, that is the ability to articulate a design need and create, craft, shape, fuck up an outcome.

That's to say, the important part of that statement is the

**intent.** The rendering can be pretty simple, but what is it that frames the problem you're trying to solve, based on there being some kind of need for design in the first place?

And that's where we might begin the answer the question about what design is. It's about responding to a brief. But briefs come in many sizes. Not the ones from Marks and Spencer, but the ones that describe a reason for something to exist.

### The problems with briefs

Professionally, briefs can be unutterably pedantic and closed. Someone wants you to make a thing that they've already defined. But they can also be wonderful and ambiguous. Somebody wants you to solve a problem, either for them, or for their customers, or their customer's customers. How that problem is identified is probably a whole other bottle of cava, but design is about understanding that brief, framing the problem and articulating an outcome

Everything is designed one way or another. Chairs. Buildings. Crops. Bicycles. Experiences. Nails. Dogs. Web sites. Designers.

And the briefs to create these designs can be infinitely variable in the language they use to describe the intent. But there'll always be a question in there. How can I make a dog that's not stupid and doesn't shed hair? What's the best knob for my cooker? What would make my banking app less shite?

### What is design?

Design is about understanding why that question exists and for whom the outcome has value. Of course, there are processes and methods, both simple and complicated, that enable one to travel from abstract to concrete in the rendering of that intent, but the real focus of design is to interpret, challenge and question everything in response to a brief, to distil the purest, most undiluted expression of a problem to be solved.

Or maybe design is just speculation. Or maybe it's instinct. In any case, it's not magic. And it's not exclusive. Everyone can design, just like everyone can make art. It's just about articulation. And maybe more cava.

*Tim Caynes is principal designer at Foolproof, where he is responsible for the integrity of the design thinking that shapes the work that we do.*

## // Security

# Cyber security is all a state of mind

**Cyber security is all a state of mind, explains Paul Maskall of Dardan Security to Celina Bledowska**

Paul started in cyber security in 2015. He gained valuable experience while working for the Norfolk & Suffolk police force, where he carried out intelligence work looking at cyber crime, security and forensics but cyber security was Paul's main sphere of focus.

### Developing a theory

Considering his job with the police it became obvious that unless one were an officer of some description it'd be difficult developing that role. On leaving the force, Paul became a police trainer. Although another government industry was an option with his skills, Paul was looking for greater freedom in relation to what he wanted to do. On the back of this he started his own company.

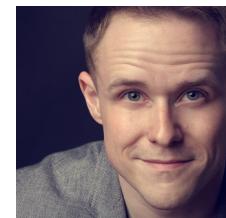
Cyber security training and consultancy seemed like the obvious route, but Paul had been thinking for some time that the issue of cyber security doesn't come from a tech basis. You can have all of the gizmos and protection you can afford, but where Paul's thinking is different - even revolutionary, is that he believes that cyber security starts from a psychological perspective. This is probably because as Paul admits, "I'm much more of a social psychologist than a techie. I look at the training element, the culture, the motivation of staff in relation to what it is that they're protecting."

### The psychology of protection

The example Paul uses to illustrate his point is, "if I put a password on your front door would you forget it? The answer invariably comes back as 'no.'" Paul explains this response by suggesting what most people do is they value what it is that's protected by the door. "With computers, technology, devices and mobile phones - essentially you don't have an emotional connection, to what's stored on the tech." Data, financial information, and all the rest of which is stored electronically, doesn't provoke the same response as physical treasures, jewellery, musical instruments, cars and beautiful objects etc. Paul believes that, "because you can't touch it, see it or feel it, you're not inclined to motivate yourself to protect it in a way that's proportionate to the amount of data that's there."

### We don't value data

When the subject of people being 'married to their phones' was brought up Paul's response was interesting. "Familiarity doesn't mean value" Through his consultancy work Paul often hears the expression, you can trust a millennial to know how tech works," but he believes that knowing how



// SECURITY  
PAUL MASKALL

tech works and familiarity is very largely divided from being motivated towards protecting security, intellectual property and more general risk.

As time has gone by he has become a general risk practitioner, so Paul does a lot more than just cyber now. He does offer technology consultancy, and gives advice on counter terrorism bombs and related subjects. Paul feels that he has ended up as a much more 'holistic security professional.'

With his widespread experience, Paul fervently believes that, "because the majority of the population does not value what it is they're protecting - because it does not see the value, it doesn't see the risk." He relates this with the fears and emotions experienced by new parents, when values change overnight, once they have to protect their new family addition. This means that the sense of risk also changes overnight. A sense of risk is dynamic. Paul says that: "because risk is neither physical nor tangible, you won't associate the risk."

Working with the oil & gas industry and other large clients, Paul always starts with the premise that first of all clients have to understand the human and psychological approach to risk. At the moment Paul is finding that his skills are most in demand where companies mightn't fully understand this..

GDPR is just one example, Paul highlighted that there was a 'post GDPR apathy.' "Oh no, the information commissioner's SWAT team has come through the door, why did we worry about GDPR so much." Paul continued, "But this is legislation that we have to abide by, and intellectual property and reputational loss are all essentially on your computers, on your cloud platforms, just look at email addresses."

### The physical and the virtual

Paul revealed that, "I've seen a dramatic change that if you've been physically burgled, to an online theft. You are more likely to be emotionally more affected by being defrauded online than having your home burgled. A burglary allows you to conceptualise in your head and assess the risk that someone has broken into your home, this provokes a dramatic impact. However, Paul believes, the impact from fraud and cyber crime is very much more surreptitious, it's more insidious, often you might have willingly given money away. The brain finds it difficult to understand the risk and impact of that action."

The message from Paul is start to value your data and the information that you store on your 'phones and then you're starting to fight cyber crime.'

*Paul Maskall is Head of cyber, risk and technology at Dardan Security*

## // Security

# Cyber security lessons learned from 'The Rise of Skywalker'



// SECURITY  
MATT DAVEY

“

If a password is stolen, it can be reset. But if your biometric data is stolen, you can't just change your body to secure your accounts again. Once that First Order coin is getting passed around the rebel fleet, you can never get it back.

They're especially relevant regarding several issues we face now, including biometrics, secure data management, and human error with passwords.

The Star Wars film franchise has fascinated society with unprecedented fervor for over 40 years, and it's easy to see why: They're Shakespearean tales with lightsabers and spaceships. But aside from timeless lessons about love and friendship and good versus evil, there are tertiary lessons about technology that can be useful for our progression toward a truly safe Internet.

For instance, it's clear that the Empire has unlimited funding, and yet the Rebels manage to sneak in and out of Imperial facilities in every film with light-speed effortlessness. They clearly have the best security in the galaxy, yet are unable to keep a 7-foot-6 Wookiee and his rowdy cohorts from grabbing whatever assets they'd like, time after time. No wonder Darth Vader had anger management issues.

Each Star Wars film has been influenced by the time and events during which it was developed. The cybersecurity lessons learned in Star Wars: The Rise of Skywalker are especially relevant to issues we face today with biometrics, secure data management, and human error with passwords.

**Warning:** Spoilers are coming.

(No kidding: You've been warned!)

### Betrayal from the inside

Early in the film, we learn that the First Order has a spy in its midst, supplying the Rebellion with valuable information. After sneaking aboard an Imperial ship (yet again), lead characters Rey, Finn, Poe, and Chewbacca are discovered, and the evil-yet-sensitive villain, Kylo Ren, orders the ship to be locked down. The spy dramatically reveals himself to be General Hux, a top member of the First Order's leadership, who bypasses the lockdown procedures and allows the heroes to make their escape.

Security protocols are only as good as the individuals who run them. Even the most hardened security can crumble when the bad actor comes from the inside.

IBM's "Cyber Security Intelligence Index" found that six out of 10 security attacks were carried out by insiders, and of those six attacks, 25% were carried out by "inadvertent actors." In addition to investing heavily in typical security standards, thorough background searches and monitoring for suspicious employee activity can also save an organization time, money, and peace of mind.

### Biometrics: two-sided First Order coin

How did our intrepid heroes manage to sneak aboard the First Order ship? With a First Order Officer's medallion, conveniently provided by friendly scoundrel Zorii Bliss. This medallion makes any spacecraft appear as if it is being operated by an officer in the First Order and allows undetected travel anywhere in the First Order's jurisdiction.

This medallion reflects the upside and potential downside of biometrics. Biometrics technology is a great convenience and can be immensely secure — you only have one face, after all — but if attackers gain a copy of your fingerprints and face scan, the impact can be disastrous. They're gaining the First Order Officer's medallion to your social media, bank account, 401(k), etc.

If a password is stolen, it can be reset. But if your biometric data is stolen, you can't just change your body to secure your accounts again. Once that First Order coin is getting passed around the rebel fleet, you can never get it back.

Beware storing biometrics data in the cloud and only utilize it for local hardware access. Otherwise, they could be exposed to anyone — and there's no telling what they'll do with it.

“

No wonder Darth Vader had anger management issues.

### LIMITING POTENTIAL GAINS FROM A HACK

In order to obtain valuable information about the location of the Sith Temple, C-3PO needed to decode Sith runes found on a stolen knife. However, his operating system wouldn't allow him to divulge critical information because it could have been used for nefarious purposes. A hacker accessed C-3PO's forbidden memories, but in doing so fully wiped his memory, restoring the iconic bot to his factory settings. That was a smart move on Anakin Skywalker's part because that built-in safety mechanism would dissuade a casual hack, knowing what the cost would be.

The iPhone and other smart devices have implemented similar security protocols. Try accessing an iPhone with the wrong passcode too many times, and the device will have to be reset and wiped to be usable again. That's a brilliant tactic when it comes to safeguarding data. After all, if the hack requires extreme effort for a relatively useless payoff, hackers don't have an incentive to act.

Security companies can go further to design systems that reduce the value of any attack. Using unique passwords for every account, for example, means that a hack only gets attackers into one service — not all of them. Limiting the payoff means hackers will think harder about targeting you in the first place.

*Matt Davey is the COO (Chief Operations Optimist) at 1Password, a password manager that secures identities and sensitive data for enterprises and their employees. In a previous life working with agencies and financial companies, Matt has seen first-hand how important security*

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