

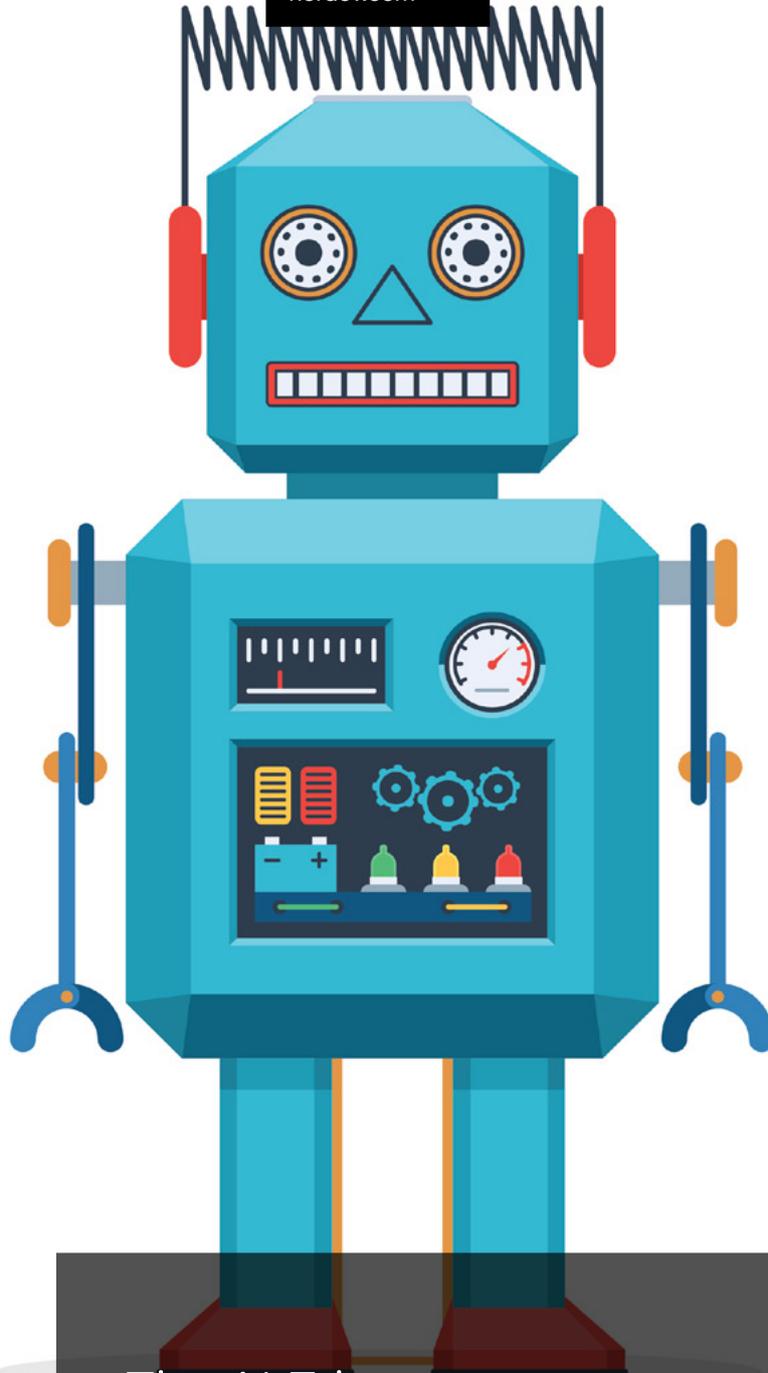
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The AI Edition

// INTERVIEWS
SyncDevloPHER
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// UPCOMING EVENTS
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<HEAD>

From the Editor

// Lauren Gwynn



Welcome to the first issue of the Norfolk Developers magazine. Well, the first issue outside of a nor(DEV): conference, so technically the third issue overall. I'm rambling...mainly because I'm not technically minded, nor do I have a particularly technical background, and the idea of writing an intro to

a tech magazine (that I've edited no less), makes me nervous.

I'm not a developer, a tester or web designer (I still can't set the time on my microwave), I'm just the organised bod who can spot a typo at a hundred paces and chase people when deadlines approach. I may have put this first-third issue together, but the thing that makes this magazine, is people like you. It is because of people like you that we have such a thriving tech community in Norwich and Norfolk, a community that has turned our Fine City into a Tech City. Without this passionate and dedicated community, there would be no reason for writers to contribute to the magazine, there would be no market for local companies to place adverts for, there would be no events to report from. Mainly, there would be no one to read this, so thank you.

With that in mind our first (third) issue had to have 'Meet The Community' interviews with Paul Grenyer

from Norfolk Developers, as well as Vickie Allen, founder of SyncDevelopHER, arguably two of the most well known Norwich-based tech meet-ups. The rest of the issue focuses on A.I., a topic we thought a good one to kick off with as everyone has an opinion about Artificial Intelligence, it affects our daily lives (see Dom Davis' column about arguments with Alexa) and it gave us an excuse to use the awesome robot image on the front cover.

We hope to continue to produce a Norfolk Developers magazine on a regular basis and, as I may have mentioned before, it would be nothing without you. If you have an opinion on a tech matter you'd like to share, or something new you've worked on that you think other people would be interested to hear about, we want to hear from you! Are you holding (or attending) an event you're proud of and want to send us a review? Or perhaps you know someone who plays a big part in the regions tech community and they deserve some attention? Get in touch with us and we'll be glad to hear from you. This is a magazine for the community by the community (have I said 'community' enough yet?).

Thanks again, especially if you've read to the end of my intro (especially after I said i wasn't tech minded) and even more so if you enjoy the next few pages.

Editorially yours,

Lauren

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// ARTICLE
MELISSA TAYLOR
luminouspr.com

AI: Better for business, better for employees?

Artificial intelligence is unashamedly a big deal - why else would Norfolk Developers' Journal be running an AI special?! With annual global revenue predicted to grow from \$643 million in 2016 to \$36.8 billion in 2025, artificial intelligence represents the fastest growing sector in IT.

Businesses have been quick to investigate the ways AI can increase their profitability and solve a variety of problems. Research by the Economist revealed that 75% of 200 business surveyed said there are plans to implement AI in their company within the next three years.

While this innovation is great news for bosses, how do team members feel about the advent of AI in their companies? As extreme as it sounds, one report from Udemy found that fear of losing your job to AI is the number one cause of stress among US employees.

Change can be scary, and that's ok. But, we think AI in the workplace is nothing to be afraid of.

While early predictions suggest a handful of jobs may be 'lost' to AI, experts reckon that the potential of AI will develop more jobs than it cuts. Let's take a look at some of the ways AI is improving things for the workforce across sectors.

Customer services

According to Gartner, by 2020, customers will manage 85% of their relationship with a brand without ever interacting with a human.

The business benefits of using AI in customer services are clear. Automating part of the process frees up customer service agents to respond to more complex tasks. This could be done through the use of AI chat-bots, or AI systems that can assist and augment the knowledge of call handlers.

Businesses will not only save and time money on training and service, but can also provide a better service experience for customers through AI. With our 'always on' society, more and more customers want to speak to businesses outside the hours of nine to five - often difficult when using human staff.

On the surface, this sounds like a very definite cut in the number of customer service agents that will be needed by businesses. However, it's not as clear-cut as that.

Imagine if freeing up the time of customer service staff allowed them to focus more on complicated processes? Not only will customers benefit from the reassuring assistance of a real human when they're facing a difficult problem, but it also creates the opportunity to make the work more rewarding for staff. There's nothing like the gratitude of a satisfied customer to thank you for a job really well done - and not even AI can do that.

Knowledge automation

When a business has a particularly knowledgeable and experienced team member, their departure could be disastrous.

Luckily, the automation of knowledge can help. Knowledge automation is not about "teaching" computers to do a job, rather it involves mapping the knowledge of experienced team members. This knowledge map can then be used to create a system that can record everything there is to know. This data can then be used to create automated training processes, or even chat interfaces that will answer questions - whatever suits the business best.

Not only does this mean no jobs are lost, but it also allows other employees to benefit from the knowledge of their colleagues. This is good news for everyone: businesses that encourage workplace training are likely to have happier employees, and happy employees are more productive, and more likely to stay in a position long-term.

Big data analysis

Data analysis and artificial intelligence go hand in hand; especially when combined with the continuous stream of data provided by the internet of things. This is one sector in

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“ Change can be scary, and that’s ok. But, we think AI in the workplace is nothing to be afraid of.



::: // ARTICLE
::: MELISSA TAYLOR
::: luminouspr.com

which no jobs are “threatened” by AI: big data sets are so large, it can’t be analysed by human minds anyway.

However, it is the potential of big data analysis for personalisation that will have the real human impact on employees and customers alike.

A large data set of customer information is a great asset for any brand looking to improve its offering. Personalised emails perform six times better than generic marketing emails, and yet 70% of brand don’t use them because they don’t have the data. Clearly, AI can be applied to help businesses learn more about their potential customers.

Of course, this data needn’t be purely digital: really smart businesses will unite IOT real-world data with information gathered digitally about their customers.

And what about the benefit to employees? Learning more about their customers can help employees serve them better, smoothing out problems from their work flow, and - if they work in sales - even boosting their commission.

AI: Better for everyone

As we’ve seen, AI offers dozens of solutions to common business dilemmas: it can increase profitability by saving businesses time, money, and resources.

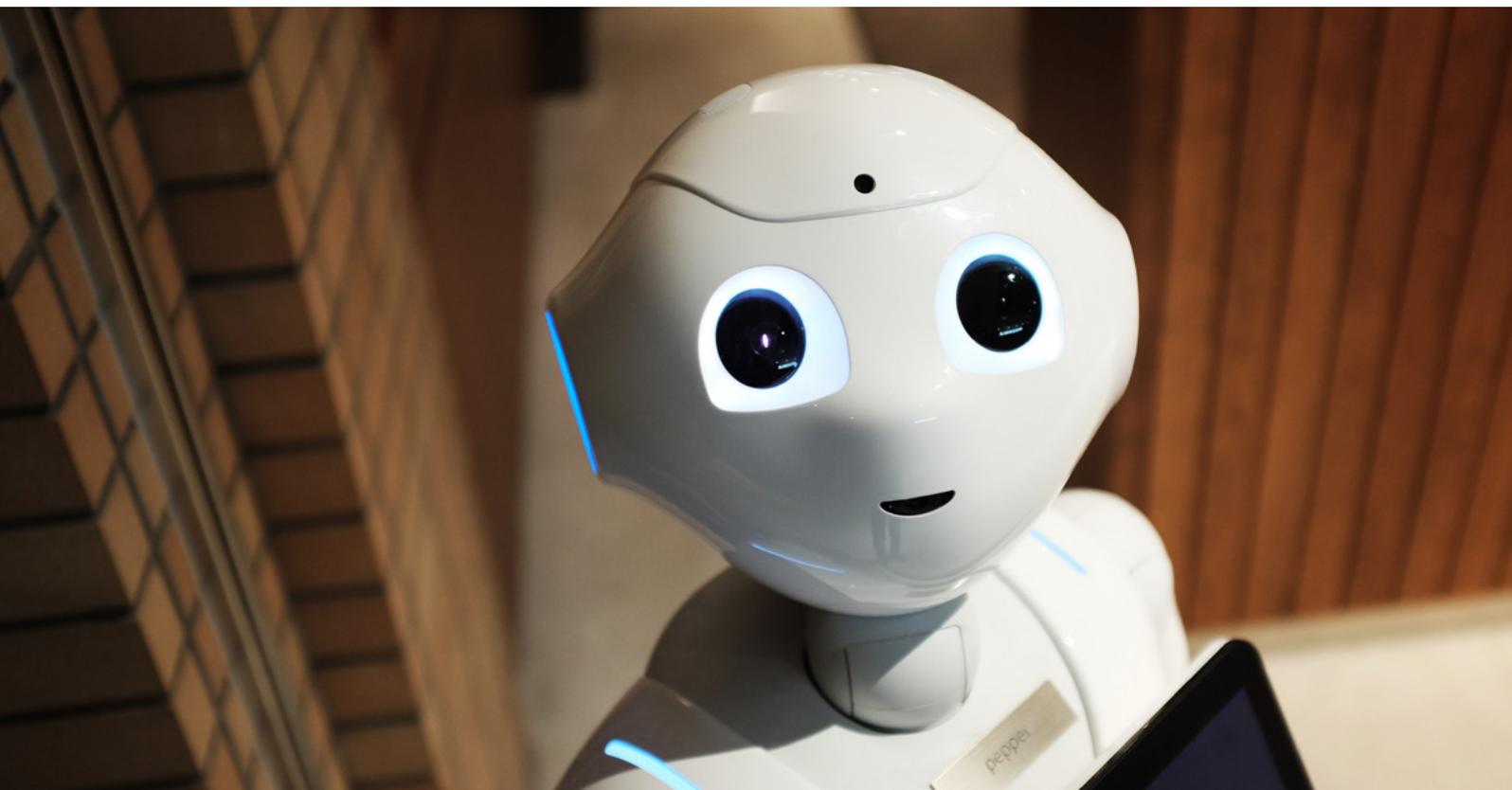
Though a business’s biggest priority is its customers, they cannot afford to ignore the value of their staff. Smart brands will invest the increased profits gained by AI into their employees.

Entrepreneur extraordinaire, Richard Branson, said it himself: “take care of your employees, and they’ll take care of your business”. This is truer than ever when it comes to tech companies. Experts agree that happy staff and an emphasis on learning are the key to successful innovation.

Sounds like AI could be HR’s new best friend...

By Melissa Taylor, Brand Communications Manager at Luminous PR

Luminous PR is a tech PR agency, specialising comms for digital businesses. We work with tech brands of all sizes: from sparky startups and SMEs to international corporates, we provide tech PR, social media, marketing, and content.



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//Article by Norwich City College

Employers' key role in success of City College's new Information Technology



:: // ARTICLE
: RICHARD STEER

City College Norwich is delighted with a successful first year for its revamped Information Technology and Computing course, saying that the input of employers has been crucial in preparing its students for a wide range of tech job opportunities.

Computing returned to the college's course offering last September, following an overhaul which saw employers consulted on the skills they wanted to see in college leavers and the key technical areas they said were most important to include.

That input from 20 employers has directly shaped what students learn on the 1-year Level 3 course, ensuring that web development and mobile app development both featured as units on the course.

Employer involvement has extended beyond the set-up of the course to include industry experts giving workshops on key topics, employer-led careers talks, and employers coming in to the college to judge computing challenges.

This engagement has helped students to better understand how IT projects are carried out in real business environments, as well as putting the students in direct contact with potential future employers.

The level of challenge on the course has been high, but its first cohort of students are on track to successfully pass the BTEC qualification. Crucially, all are now set to enter the labour market – directly into jobs or apprenticeships – or to complete an optional second year of study to further their computing knowledge.

Computing student David Peck feels that the course has helped him become clearer about which area of IT he wants to work in, saying:

"I knew I was interested in tech and computing, but I wasn't sure what specific area. This course has shown me that web development is what I am

interested in. I have applied for a fair amount of jobs because of this course."

He continued, "I definitely think the course is relevant. We've had contact with Aviva, who specifically contacted us because of the course that we are doing. So a few of us have had interviews there for apprenticeships that they are running."

Fellow student, Daniel Hayes, 20, added:

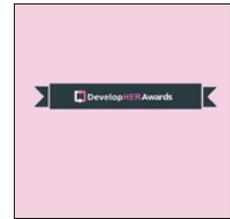
"A big part of it is definitely relevant to getting a job in IT. They've taught us real world things, how projects go, how everything works within say web development or building an app. They've taught us the steps in doing it, like how they would do it in a job. So it's made it very relevant, showing us the skills and what you need to do in a job."

Information Technology Lecturer Laura Flood, commented:

"The support we have had from employers to help us get the content for the course right has been fantastic. Having employers and IT professionals coming in to contribute to sessions has added to the links to the world of work. We are now looking to build on this success and we would love to hear from other local employers and tech professionals who would be interested in getting involved with the course next year."

To find out more about linking up with the Information Technology and Computing course at City College Norwich, contact Laura.Flood@ccn.ac.uk.

//Interview

Meet the Community:
SyncDevelopHER

// INTERVIEW
 VICKIE ALLEN
 syncdeveloper.com

SyncDevelopHER play a very important part in our community. They promote the role of women in tech and seeing as this magazine has been put together by two women, we felt if appropriate to include them as part of our 'Meet The Community'. Started by Vickie Allen just a few years ago, what began as a networking group has expanded into an annual awards show celebrating accomplished and inspiring women in tech. We get a few words from Vickie herself about her aspirations for SyncDevelopHER and how far her group has come.

When was SyncDevelopHER founded?

I founded a networking group called SyncDevelopHER as a sister group to SyncNorwich back in 2013 to bring inspiring female speakers to Norwich. In 2015 I ran the first DevelopHER awards, to bring even more women together and celebrate their success.

What inspired you to start it?

I started SyncDevelopHER because I was shocked at the low number of women attending the regular meetups in Norwich. I wanted to encourage more women to come to events and raise awareness of the lack of women which most people attending seemed to accept as normal.

How has SyncDevelopHER evolved since it first began?

Since 2013 we've run a variety of events but now we are focused on our main event every year - the DevelopHER awards - which currently is based in East Anglia and moves cities every year. We've gone from meetups with 30 people to a huge awards ceremony with 250 attendees!

Is SyncDevelopHER what you imagined it would be now?

It is far more than it was ever imagined to be and it's great to be recognised and to be meeting so many amazing women in tech.

What is your favourite part of SyncDevelopHER?

My favourite part is getting to meet all the fantastic women who get nominated, shortlisted and win every year for the DevelopHER awards. With around 150 nominations every year that's 450 women to date!

And SyncDevelopHER's greatest achievement?

Bringing together 250 people every year to celebrate the regions best women in tech!

Where do you see the awards going in the future?

I'd love to continue to grow the awards and maybe start running it in another region too!

One thing people might not know about SyncDevelopHER?

It's run completely by volunteers, no one involved gets paid at all and we all have full time jobs too!



//Article

3d Printing: Opportunity or Risk?



:: // ARTICLE
: ALEX SAUNDERS

It will come as a surprise to many that technology underpinning 3D printing (often known as “stereolithography” or “additive manufacturing”) has existed for over 30 years, first entering public consciousness when French inventor Alain Le Mehaute filed a patent to protect the stereolithography process in 1984.

Whilst progress in the commercial development of 3D printing stagnated during the 1980s and 90s, the expiry of original patents over recent years has seen a new wave of interest in the possibilities that can be achieved through 3D printing. The potential benefits of 3D printing have been widely commented on and are seemingly endless; from offering a solution to the global shortage of organs for transplants to revolutionising the way that food is consumed.

At a commercial level, in light of the dramatic fall in the cost of 3D printers over the past few years, large-scale manufacturing can for the first time be realised by ordinary consumers. It is therefore possible that we will see a paradigm shift in the operation of supply chains, with consumers and small businesses “printing” their own products rather than approaching third party manufacturers to do so.

Although these expectations are likely to be impossibly high for a single technology, there is little doubt that 3D printing will be transformative in both commercial and not-for-profit sectors. However, as with any significant innovation there are likely to be risks and implications that need proper consideration; in this case, the potentially disruptive effect that 3D printing may have on the legal framework governing Intellectual Property Rights (“IPR”).

As it becomes easier and cheaper to reproduce any object, there are concerns that the copier will be exposed to a claim for infringement of a third party’s IPR. There have already been instances of copyright infringement claims in the United States, including an online trader who sold iPhone chargers in the form of the Iron Throne from HBO’s series, Game of Thrones, and there are expected to be many more. Although most would agree that this is the correct approach where commercial printers are involved, it may be seen as overly prohibitive to restrict consumers who wish to replicate items for personal use.

The purpose of this article is to briefly review the

potential impact that 3D printing will have on the framework of intellectual property rights in the UK.

Copyright

Copyright is an important intellectual property right to consider in the context of 3D printing. Copyright automatically subsists in certain works involving intellectual creation (e.g. literary or artistic works). Copyright does not need to be registered, and will usually come into existence upon creation of the relevant work. Depending on various factors, such as the type of work, copyright protection can last for up to 70 years after the death of the person who created the work.

For an object to qualify for copyright protection it must be an “artistic work”. It is commonly understood that only sculptures or works of artistic craftsmanship can legitimately be categorised as artistic works. On that basis, it is unlikely that mass-produced objects will benefit from copyright protection.

The Courts have confirmed that for an object to be an artistic work, it must have some aesthetic appeal, taking account of the author’s intentions. For example, a mass-produced suite of furniture was deemed not to qualify as an artistic work, whereas individually handcrafted jewellery may. In any event, it has been historically difficult to successfully establish that an object is an artistic work for the purposes of copyright.

However, if the original object does qualify for copyright protection, the reproduction of that object using a 3D printer is likely to amount to copyright infringement – unless the copier has a defence or consent from the owner of the copyright. Whilst this is likely to be of concern for businesses reproducing objects on a commercial scale, consumers who “print” a personal copy of an object for private, non-commercial use will have a valid defence under copyright legislation. In these circumstances, consumers would not be deemed to infringe on the copyright of the original object.

In view of the above, the fundamental question will be whether the original object qualifies for copyright protection, and if so, whether the 3D printing is being carried out for commercial purposes. If the answer to

//Article



::: // ARTICLE
::: ALEX SAUNDERS

both is positive, it is expected that the copier will be infringing on copyright, unless they have a defence or the necessary consent.

Trade Marks

Trade marks are used by traders to differentiate their goods or services from those of other traders. Trade marks are usually a business' trade name, logo or strap line and can exist either as a registered trade mark (where the owner would apply to register the mark on a specified register) or an unregistered trade mark.

Generally speaking, the owner of a registered trade mark has the exclusive right to use the trade mark in relation to the goods and/or services for which it is registered. On that basis, if a third party seeks to use a similar or identical mark in relation to similar or identical goods and/or services, the owner of the existing trade mark is entitled to bring proceedings for trade mark infringement.

If an object contains a trade mark, the reproduction of that trade mark by way of 3D printing may be an infringing on a third party trade mark. However, in most cases, the owner of a trade mark will only be able to bring a claim for trade mark infringement if the reproduction is "in the course of business". Similarly to copyright, commercial traders who are printing objects for the purposes of sale need be cautious about the prospect of trade mark infringement. However, consumers printing objects in a personal capacity are unlikely to be acting in the course of business, and therefore reproduction in these circumstances will not amount to trade mark infringement.

Design Rights

Design rights are intended to protect the appearance of purely functional articles, with no requirement for artistic or aesthetic appeal. Like trade marks, design rights can be registered or unregistered. In order to register a design, it must be whole or part of a product, new and have individual character. Once registered, design rights can be renewed every 5 years up to a maximum of 25 years.

Design rights may be the most appropriate form of protection to prevent objects being commercially reproduced by way of 3D printing, and can fill the

gap where copyright will not apply. Commercial reproduction of objects using 3D printers without a valid defence or the consent of the owner of the design right may constitute infringement of design rights. Designs rights share a similar defence as applies under copyright and trade mark law; the reproduction of an object will not be design right infringement if it is carried out by an individual for private, non-commercial use.

Comment

On brief analysis, it appears that the current IPR framework is sufficient to adequately address the reproduction of objects using 3D printers. It ensures that commercial 3D printers are still required to obtain consent, as would be the case in any other manufacturing process, whilst ensuring that consumers are not unfairly penalised for replicating objects for their own private use.

Those most at risk of infringing on third party IPR will be small businesses, who are seeking to cut manufacturing costs by printing products themselves without proper assessment of the legal implications. It is expected that corporations who own IPR in objects or designs will be wise to the likelihood of infringement and will inevitably step-up their operations to monitor use of their IPR in the context of 3D printing.

However, whilst some traders may be focussing on the need to more-robustly enforce their intellectual property rights to prevent infringement, others see opportunity in commercial exploitation of 3D printing. For example, Lego have obtained a patent to protect the process under which it will enable its customers to print their own Lego bricks on 3D printers at home. It is easy to see how the prospect of printing your own product, licensed by the product owner, could capture the imagination of consumers. For businesses, it could be a simple, cost-effective way to add another revenue stream. Commentators have suggested that other retailers and/or product owners may also follow Lego's initiative and make their products available to be printed using some form of subscription model.

Whatever forthcoming avenues are to be pursued by businesses and those in the non-for-profit sector, it is plain to see that 3D printing has the potential to cause widespread disruption in a range of traditional industries. For many, however, this disruption will give rise to opportunity, which on assessment, is more than likely to outweigh the risks posed by 3D printing.

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//Article

The role of AI & Business Intelligence



// ARTICLE
MARK DONALDSON
Cascade.bi

We are certainly on the cusp of a fourth industrial revolution which will change the way in which we all work. Whilst with the past three industrial revolutions, technology changes have been disruptive, they have not been net destroyers of job roles. Does AI promise this?

The world of business intelligence is fundamentally all about providing the right information to the right user and at the right time.

Throughout my career as a Finance Director, CFO and accountant within practice, I have worked with hundreds if not thousands of SMEs and the one common theme is that they not clearly understanding their business performance.....so is there now finally the opportunity to solve this?

The benefits to SMEs of receiving business information are now beginning to become clear with a far increased adoption and awareness of the power of their own business data.

This data could take the form of very simple Google Analytics, through to the number of Twitter followers or customer or product sales. Moving forward the understanding of these can be interpreted using AI, however I believe the limiting factor is that all businesses operate differently and the owners do not have the time to teach AI the basic tasks, or perhaps do not even understand the basic tasks to a sufficient level of detail themselves.

AI is undoubtedly a powerful tool which can very easily take on tasks within a business. I think it will be adopted mostly in its most basic form, through machine learning and the standardisation of repetitive and rules based tasks. These tasks for an SME are often performed by the finance function and therefore areas such as credit control and some reporting will be eroded by a far more efficient process.

The adoption of AI for many SMEs may be problematic in the short to medium term as they fail to understand the power it can bring and generally lack the trust of a "computer system". The most sophisticated businesses will embrace the technology first.

Let's first take the example of a simple credit control team within an SME. They will periodically raise and send statements, (checking them first for errors), email and phone the customers to chase for payment and use a strong element of human interaction, emotional intelligence and discretion to ensure the cash is received in a timely manner. Using AI to replace this whole function would eliminate the relationship and rapport element to credit control and may end up damaging relationships with customers. Instead a hybrid solution of utilising AI would work, providing prompts to action, automated emailing of documents, leaving the emotional intelligence and relationship aspects to the human. If trained

About the author

Mark Donaldson is the founder of Cascade.bi, which provides SMEs with an out of the box solution for Business Intelligence. As a Chartered Accountant, Consultant FD and Advisor, he understand the day to day challenges which SMEs face both embracing technology and adopting it.

properly AI could free up the mundane tasks and make the credit controller more efficient.

AI is currently in its early stages and is good at the simpler, limited problems like sentiment analysis (e.g. is a free text sentence from your customers good, bad or neutral) where there are few variables. This 'opinion mining' may not always be present in communications with customers with an increasing level of email communication being done with very limited amounts of verbose.

Non AI statistical methods are more than sufficient at stating where a business currently is (KPIs % increases, ratios etc.) but are unable to explain why the current situation has arisen or forecast the future.

AI has promising potential to explain both why and predict the future but current AI technology (and this is likely to be the case for at least the next 5 years) requires a lot of processing power (that even the explosion of cloud computing can't help bring down to the real-time realm that BI requires) and a lot of data. This processing power coupled with the disparate data (paper based), will be a real obstacle.

AI may start to have application in larger companies with sophisticated systems that produce and store large quantities of data for AI to sift through but SMEs don't. Their systems are usually limited and only tell a small part of the story, a lot still keep important records in paper form (outside AI's reach), they rarely have specific workflow tools so their accounts system is the biggest source of SME data which will contain a wealth of information about who bought what product and when but without more (non-transactional) data about the purchase, few insights can be gleaned that standard statistical models cannot already predict.

An example for an SME, is that AI isn't going to predict that sales from a customer will dip next month because the sales rep is off sick or that the contract to supply is due for renewal (held outside any system) and that the contract terms change, alter or the customer terminates their supply agreement.

I firmly believe that AI in its simplest form, can be used to assist SMEs in certain areas, however these are generally the more task based approaches, which would replace a human repetitive task.

In summary, whilst the next industrial revolution is upon us, the number of net job roles to be destroyed will take time. I think in 5 years time, SMEs will start to see the benefits, and it will be those leaner, fitter businesses with more technology accepting minds who will embrace it first and reap the rewards. The masses of "typical SMEs" will be slow to adopt and this will protect jobs for the next decade.

//Article

Talking to The Clouds



// ARTICLE
DOM DAVIS
@lamdom

“Alexa, turn on the lights please.”
“I found several devices matching that name. Which one did you mean?”
“...The lights?”
“OK.”

Now this is probably my fault, I've got 3 smart bulbs in my room, two on the wall which I've called “The Lights”, and one by the bed which I've called “The Bedside Light”. And the fact that Alexa can generally understand me is a miracle. In contrast, Siri and I don't got on well at all.

“Alexa, play some V.N.V. Nation”
“Playing songs by Vnv Nation”

The pronunciation may be a little garbled, but it's the right band. No such luck with Apoptygma Bezerk. I've resorted to playlists with names that I can pronounce in such a way that Alexa can understand.

When I say Alexa, I really mean the speech-to-text backend running somewhere in Amazon's cloud, because Alexa, Siri, OK Google, and Cortana are really just fancy front ends to a bunch of cloud based voice processing, text processing and routing.

Ignoring the fact that natural language processing with speech is insanely hard, there's nothing clever going on. Amazon even have an API I can call which is audio in, text out, so the insanely hard bit is covered. Speech gets handed to me as text. I can give that

text to something similar to a chat bot to process and route that command. The resulting text I can run through a text-to-speech engine to be spoken to the user. So I too can create a...what?

Wikipedia defines Alexa as “an intelligent digital assistant”. This would imply that Alexa is both intelligent and artificial. Does it follow that Alexa is an Artificial Intelligence, or AI? It's a tricky question. It's also irrelevant. Depending how you define AI it is either here already; or it's a moving wave front that is just beyond what computers can currently do; or it's something vastly beyond our current capabilities. It's a pointless semantic argument. In fact my favourite definition of Alexa is “a glorified clock radio”, and there isn't even a visible clock.

What's more interesting is how we're accepting these things into our lives. Regardless of how you define them, they start raising some intriguing questions. The use of voice as the primary (or in Alexa's case only) interface causes us to anthropomorphise these devices and this leads onto a discussion about how we refer to them.

For me, Alexa and Siri present as female, so my preference is to use the female pronouns “she/her”. Siri on my wife's devices presents as male, so is “he/him”. I find “it” too impersonal, bordering on rude, which is odd because we're talking about electronics and software here. But this is subjective. Others may find the use of anything other than “it” bizarre, precisely because it is just a bunch of electronics and software.

//Article



// ARTICLE
DOM DAVIS
@lamdom

“ It’s not hard to envisage a future where, on the phone at least, it is difficult to tell if you’re talking to a human or a computer

The founders of Mycroft AI discovered that their children struggled using Mycroft, but were fine using Alexa. The reason: Mycroft insists on you being polite, with appropriate use of please and thank you. It’s set up this way because they don’t want their children growing up to think the kind of demanding language an AI would happily respond to is the correct way to converse with everyone.

While this may sound a little quirky now, advances in voice processing and speech synthesis are improving conversational computing rapidly. It’s not hard to envisage a future where, on the phone at least, it is difficult to tell if you’re talking to a human or a computer. While you could argue that being brusque, or even downright rude, with an AI is fine, you now run the risk of being rude to a human.

This anthropomorphism of electronics is hardly new. The Sony AIBO caused many people to become attached to their new robot pets. Sony went so far as to start using veterinary terms for repairs and tech support. This was because the purely technical language initially used caused a negative customer reaction.

We’re not too far away from voice enabled smart devices designed to elicit an emotional reaction and cause an attachment from their owners. Using polite forms of conversational language will aid this, and companies will be looking to encourage it to maintain the ‘stickiness’ of their device and brand.

The counter argument is that we shouldn’t be encouraging this kind of virtual relationship as it’s

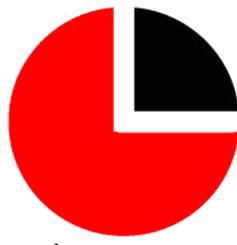
effectively manipulation of the user. A formal, terse and efficient command set would help maintain the boundary between interacting with a machine and interacting with others.

Regardless of your position, it’s a philosophical discussion, not a technical one. There are no cut and dried answers, and it introduces things that we, as humans, are poorly equipped to reason about. For example, is an Intelligent Agent a singular entity, or multiple entities?

I find it easier to view them as single entities accessed via a myriad of devices, and personalised to the device. The reality is that there are multiple instances of these agents servicing multiple devices. The “Alexa” you access in one interaction may not be the same one you access in another.

Viewing Intelligent Agents as a singular entity is my brain’s way of handling the dichotomy reality presents. Giving this amorphous collection of services and servers a name eases us into this way of thinking. As these agents become more lifelike in their interactions will we continue to accept them into our lives? Or will there be a backlash as we relegate them back to mere devices?

I don’t know. Instead I put the question to you, and invite you to explore this question further in November when Norfolk Developers will be holding a special panel discussion on this topic. As always, audience participation is encouraged, so what’s your take? I look forward to hearing it.



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//Article

Building a Successful Chatbot



::: ARTICLE
: JOE DIXON
: ubisend.com

First things first, what exactly is a chatbot?

A quick Google will give you lots of different answers to this simple question. I have attempted my own definition with the caveat that this fledgeling technology is constantly evolving so this may well be out of date by the time you read it. Here goes:

> A chatbot is a software program that an end user interacts with via a conversational interface such as Facebook Messenger, Slack, Telegram, etc. The software program itself can utilise artificial intelligence to simulate conversation using natural language understanding (NLU), it can also be rule/flow based with the goal of directing a user down a specific path, or it can be a combination of the two.

Background

I have been building enterprise-level chatbots at [ubisend](#) since early 2016. The spectrum of projects we have been involved with has been huge and includes everything from sales tools to celebrity personas to daily news briefings. Even though the scope of these projects has been so varied, I have come to the conclusion that many of the key concepts to building a successful bot remain consistent no matter what the goal or scope.

The rest of this article will provide you with an overview of these key concepts. I would recommend you keep these in mind if you are building a bot.

Key concepts

Manage expectations

For me, this is one of the most important points of all. At the very beginning of the user journey, set the expectations of what your bot can do. This would usually be in the very first message or at the end of the onboarding sequence if you have one. It should be a concise overview of the main purpose of your bot. The [Golden State Warriors bot](#) is a great example of how to do this well.

Personalisation

Personalising messages can be as simple as using the name of the user when chatting, right up to building a



full user profile you can use later to tailor the content of your messages. The more information you have, the more personal you can make your service which will serve to delight your users.

Don't try to know everything

Trying to respond to every question should not be the goal of your bot. In my experience, you will waste a lot of time setting up your bot for questions that its users will never ask and lose focus of the core objectives.

Have defined goals

No matter what the purpose of your bot, make sure you know what it is you are trying to achieve. If you are new to bots, you are likely working with a completely different interface than you are used to. One that you have little control over. This can make it more difficult to direct a user where you want them to go or even educate them on what they can achieve with the bot. Keeping your goals in mind can help you to focus better on the user journey.

Know your subject matter

This is aimed more at those bots utilising NLU to determine the intent of the user's input and respond accordingly.

//Article

“ ...you are likely working with a completely different interface than you are used to. One that you have little control over.



::// ARTICLE
:: JOE DIXON
:: ubisend.com

Now that you have a set of defined goals and have set the expectations of the user, your bot better be able to do what you say your bot can do! Failing to answer a question on a subject you have told the user they can talk about ends in a pretty bad user experience.

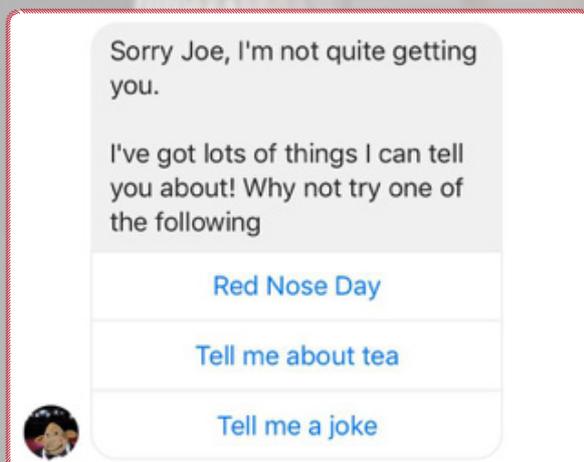
Be clever with your content

If it's a bad experience for the user when your bot can't answer a question, it's even worse when the bot asks the question and can't understand the response. With that in mind, try not to ask questions in your responses unless you are confident you will be able to handle it and reply accordingly. I have made this mistake in the past...



Error handling

It's inevitable that your bot will get it wrong and this is OK. Users tend not to be put off as long as you give them a way



of getting back on track. Consider using what I like to call conversation aligners. If your bot is stuck, give the user a way to move on and perhaps reaffirm the scope of your bot to try and guide the user into talking about something you can handle. We built this into the PG tips Monkey bot to great effect.

If things are going really wrong, you may also want to consider giving the user an option to speak with a human.

Keep learning and iterating

Finally and most importantly, analyse the conversations your bot is having and learn from them. If you are using NLU, figure out where your bot is getting it wrong and train it so it doesn't make the same mistake again. If you have a flow-based bot, make sure there are no bottlenecks where users are getting stuck. As with most pieces of software, learning from your users is important.

The great thing about bots is you're not reliant on feedback from the user. You are getting the feedback in real time as you can see exactly what the user is asking and what they are trying to do. You'll quickly be able to see what is working, what isn't and what the most obvious features are that you need to add.

Summary

As with most software projects, building bots can be very challenging and equally very rewarding. Watching conversations in real-time is an unusual experience as it's not often you get to see exactly what your user is seeing. This is the best feedback you could possibly get to help iterate and improve things for your users. Keep things simple, defined and allow a user a way out if they get stuck and you will be well on your way to a successful chatbot.

I hope this has been useful. If you have any feedback, please feel free to get in touch.

// Interview

Meet the Community:
Norfolk Developers

... // INTERVIEW
 ... PAUL GRENYER
 ... @NorfolkDev

Norfolk Developers almost need no introduction. If you're reading this magazine, you know who they are. Considering the group's importance and influence in the region's tech scene, they were an obvious choice to feature in our 'Meet The Community' feature. We spoke to founder Paul Grenyer about nor(DEV): about his favourite moment of past meet-ups and what the future holds for the deep-tech group.

When were you founded?

July 2013, by Paul Grenyer, Dom Davis & Taylor

What inspired you to start norfolk developers?

Paul Grenyer started a group 18 months before, called **Agile East Anglia**, which was one of the groups which merged to form SyncNorwich in 2012. After he left SyncNorwich, Paul ran a small MongoDB based meetup group, which had three events, before he realised there was an appetite for a purely technical group in Norwich. So he formed Norfolk Developers with Ben and Dom.

How has norfolk developers evolved since it first began?

In lots of ways. As well as regular monthly evening events featuring two, fortyfive minute tech sessions, Norfolk Developers now also run quarterly breakfasts and a monthly networking event call NorDevBiz. The jewel in the crown is the yearly Norfolk Developers Conference. Norfolk Developers as also run lunches and Agile on the Bench sessions in the past.

Is it what you imagined it would be now?

No, it's much bigger and does so much more.

What is your favourite part/memory/aspect of norfolk developers?

When **Robert "Uncle Bob" Martin** came to speak a packed room just before Christmas 2015.

And the groups greatest achievement?

Probably over 400 people for the main conference day in 2016.

Where do you see norfolk developers going in the future?

Hopefully the membership will continue to grow. Attendance will grow and it will help Norwich and Norfolk be seen as the place where tech entrepreneurs come to start their businesses.

One thing people might not know about norfolk developers?

Norfolk Developers meetups were originally held in Virgin Wine's meeting room at st. James Mill before moving to the King's Centre.

// Upcoming Events

| | | |
|-------------|-------------------------|---|
| 30.9.17 | Digital East Anglia | Full Day Workshop: Implementing VR in Unity3D by Richard Bang |
| 4.10.17 | nor(DEV): | The Right Brain of IT & TBC |
| 5.10.17 | nor(DEV): | JavaScript Starter Kit - Beginners Full Day Workshop |
| 10.10.2017 | Norfolk Game Developers | October Show and Tell Meetup |
| 24.10.17 | Norfolk Game Developers | October Social |
| 21-29.10.17 | The Forum | Norwich Science Festival |
| 1.11.17 | nor(DEV): | Burkhard Kloss on The Ethics of Software & Panel: Talking to the clouds |
| 07.11.2017 | Norfolk Game Developers | November Show and Tell Meetup |
| 21.11.2017 | Norfolk Game Developers | November Social |
| 23-25.11.17 | SyncNorwich | Sync The City |
| 25.11.17 | SyncDevelopHER | DevelopHER Awards |
| 14.12.17 | Hot Source | #Festie 2017? and other ideas for four Hot Source evenings |

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//Review

Untangled



::: // REVIEW
 ::: HARRY HAROLD
 ::: neontribe

Neontribe has been helping young people learn about coding since the company started. Last year, we ran “Untangled”, a week-long event to make Internet-controlled gadgets. We’ll never forget the triumphant looks of those who built a website where you could make a toaster pick how toasty its toast was going to end up.

This year, we went gaming. “Untangled 2017” started with a blank map, and a square you could move left and right. The idea? Eight young people from the Norwich area would get a week to turn that into a proper game. They’d be mentored by Neontribe staff and local game developers, teaching and helping them get through the trickier bits (Anthony Stansbridge deserves a lot of credit for making the event happen).

Untangled is all about young people making the decisions, so the first task was for them to agree on a style of game. Ideas such as a ‘Hunger Games’ scenario and a ‘Battle Royale’ type game were discussed with a final vote to decide. The result? A top-down capture the flag scenario.

Using Raspberry Pi’s and the Python programming language, they started their journey into software development.

Day 1 of the event consisted of orientation and planning:

- Teaching everyone the basis of maintaining version control using Git in their own GitHub accounts
- Making sure everyone knew the core concepts of working on a team project and how to work on the same code at the same time
- Planning what seemed like a reasonable amount of development work to get through in a week
- Assigning tasks to someone based on whether they wanted to get involved with programming or visual design

The next three days were spent working on the game:

- George (@GLBro) and Nat (@whizzer0) made the map
- Raphie (@Raph-child) and Oli (@DuctTapeNinja) worked together to add spells and projectiles
- James (@LiveG-Technologies) maintained the documentation using a wiki
- Ruben (@thegraphicsgamer) was the textures man, editing each individual texture to fit the game so the map looked the best it could. Using his past skills with image editing software and his interest in 3D printing to help him
- James (@OverHill123) worked on power-ups for the game, letting the player perform actions such as increasing their speed to gain an advantage
- And some even tried to hack the game!

Development was so successful that the team had time to add some features which didn’t make it to the plan on Day 1; a minimap displaying player locations, and a heads-up display which showed information about the player, both by Harry (@spanner).

Neontribe kept rigorously to the industry standard for fixing bugs; one bug fixed equalled one Kit-Kat!

The final day of Untangled 2017 was spent playing the finished game. The highlight of this was a 4v4 match between the developers and Neontribe, fueled with childish screaming and frustration coming almost exclusively from the Neontribers. The event was concluded with a presentation given by the young people, explaining their experiences and what they had learnt over the week.

This is what the week meant to one of the mentors, Matt Williams of UEA, who is at Neontribe as an intern over the summer -

“Untangled is about learning but not just for the young people. In the week of the event I learnt more mentoring the enthusiastic youth of Norwich than during any week of my university life. During the week,

//Review



Everyone learnt something, even the mentors, as teaching is the best way to learn



::: // ARTICLE
::: HARRY HAROLD
::: neontribe

we were the young people's guide, teaching them the basics of software development and then assisting them with any problems that arose. We would always guide them in a constructive direction, without solving the problem outright. This allowed the participants of the event to overcome obstacles themselves.

My advice for future mentors of Untangled is to mimic 2017's model, and have a solid base for the young people to work from. Untangled is chaotic by nature, so having this head start is beneficial for everyone. By performing the trivial framework tasks, such as implementing the network capabilities and creating the default map beforehand, it allowed the week to be more productive, with no long delays in development and letting the young people begin making new features immediately. The difference between the base game and the result of Untangled 2017 is astounding: 13 authors, 344 code commits, 2,290 additions.

There weren't many negatives with this year's Untangled, everyone made progress as a software developer and the final result was a fully functional game. One minor thing I would suggest in the future would be to have control over the Pis. Being able to lock everyone's screen, for example, would make communicating as a group much easier, with fewer distractions.

My final thoughts, as a mentor of Untangled 2017, are of satisfaction and relief. The week ran as smoothly as any event such as this could, and with a successful result. Everyone learnt something, even the mentors, as teaching is the best way to learn.

One of the most important skills in industry is the ability to work as part of a team and this is especially relevant in software development. The current education system doesn't emphasise this enough, with most schools teaching students how to create systems by themselves and rarely giving them the opportunity to work in larger teams. This makes events like Untangled even more important.

I encourage anyone interested in this industry to get involved with Untangled or a similar event. Whether it be to take part, wanting to mentor or just wanting to see what all the fuss is about, it will be an invaluable experience for you.

I hope to see you at the next Untangled!

Matt Williams (UEA)"

The code for the final game can be found at <https://github.com/neontribe/untangled-2017>
The base game is at <https://github.com/Stansbridge/untangled-2017>
Documentation at <https://github.com/neontribe/untangled-2017/wiki>

Neontribe believes learning never stops, so everyone was given their Raspberry Pis to take with them, letting them continue to code at home and of course play their amazing game!

We're really proud of Neontribe's work with the next generation of coders; Untangled is only a part of that. There's more on our website:

George Deeks writes about his "snake game challenge" at: <https://www.neontribe.co.uk/snake-game-challenge-for-young-programmers/> (Yes, of course it's written in Python...)

We've sponsored the CAS Scratch-Off at UEA for the last couple of years: <https://www.neontribe.co.uk/2017-cas-scratch-off-competition/>
Karl Jermy talks about working with Bacton School here: <https://www.neontribe.co.uk/coding-with-kids/>

It's part of a commitment to show real effort going in to projects for social good, alongside our work for big corporate clients.

The final words go to George, one of the young coders: "You're a legend."

That'll do us.

//Advert



Eagle Labs

A space to create, innovate and grow

Barclays Eagle Labs Shared Growth Ambition

When communities in which we live and work thrive, we all do too. At Barclays our long-term aim is to create and curate a series of products, service and co-operative partnerships that improve the lives of people in the communities which we serve.

The great news is that Barclays has an Eagle Lab in Norwich! Under a partnership with Barclays and WhiteSpace we will give Norfolk entrepreneurs and the wider community access to a facility that will help them experience the potential of cutting edge technology and will encourage them to think about how it could be applied to the creation of innovative future solutions.

How we do this

A not-for profit co-working space through WhiteSpace

Mentoring & coaching from growth specialists

Access to 3d printing, Vinyl cutter and Laser cutter

Ability to rapidly produce and test prototypes without having to import from overseas, reducing cost and time taken from concept to market

Events space and incubator

Professional network links and introducers

Introducing WhiteSpace

WhiteSpace is a not-for-profit co-working space based at St James Mill in Norwich. With a fast-growing network of entrepreneurs, investors, mentors



// ADVERT
GLEN WEBSTER
Barclays Eagle Labs

and influencers, the Whitespace network encourages collaboration and growth within a supportive and like-minded community of tech and digital innovators.

Introducing Anthony Pryke to bring all of this together under a Norwich based tech Eco system

Anthony has worked for Barclays for over 15 years across many different sectors, most recently building relationships with key customers and companies around Norfolk and Suffolk. Using these connections he has been able to collaboratively organise commercially successful showcase events for local entrepreneurs ranging from unique experiences with Aston Martin to large scale partner charity events which bring to life the best of Norfolk and Suffolk .

From these experiences, Anthony will be arranging events focusing on the Norwich digital, tech, creative and developer networking eco system. Look out for these being brought to life on the Norwich Eagle Lab Twitter page @eagle_labs_NWI

In Anthony's words

"In the world of banking, I never thought an opportunity to work in this exciting environment which has a huge opportunity to contribute towards nurturing the growth of Norfolk and Suffolk being a leading digital tech hub would arise"

The Norwich Barclays Eagle Lab would love to hear from you to chat further around the opportunities that we can create together. Below are the ways to make contact, share ideas and how to get involved.

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<FOOTER> Patterns

// FOOTER
PAUL GRENYER
@pjgrenyer

Software patterns have their roots in architecture. In 1978, Christopher Alexander published a book called 'A Pattern Language: Towns, Buildings, Construction' (ISBN-13: 978-0195019193) about the patterns he'd discovered designing buildings. A pattern can be thought of as a tried and tested way of doing something which can be applied in different contexts. Think about how the Observer or Visitor pattern is implemented across languages such as Java, Ruby and JavaScript, where the different language idioms dictate slightly different implementations of the same basic pattern.

Software Patterns became popular with the publishing of the Gang of Four book, "Design patterns: elements of reusable object-oriented software" (ISBN-13: 978-0201633610) in 1994. It contains a number of patterns, most of which every developer should know, even if it's to know to avoid the likes Singleton. However, these aren't the only patterns! Indeed, patterns are not created, they are discovered and documented. Whole conferences are dedicated to software patterns (<http://www.europlop.net/>), where delegates are encouraged to bring their pattern write-ups for appraisal by their peers and the experts.

In 2000 I joined the ACCU (<https://accu.org/>), a group for programmers who strive for better software. I was encouraged by another member to write for the group's magazine, but I didn't think I'd have anything to contribute that someone better hadn't already thought of and written about. As I gained experience I found I had quite a lot to write about and to challenge.

In the same way you'd have thought that 23 years after the Gang of Four book most if not all of the software patterns had been discovered and documented. However, it appears not and I was very

surprised to find that what I'm calling the "Single CrUD Transaction" pattern, although used by many, doesn't appear to have been written up anywhere publically. I checked with industry experts and they weren't aware of it being written-up either.

This is my first software pattern write up and where better to share it for the first time than Norfolk Developers Magazine?

Name

Single CrUD Transaction

Intent

To create, update and delete items in a datastore within a single transaction.

Problem

Sometimes it's necessary to create, update and delete items in a datastore in a single transaction. Traditional web applications support create, update and delete in separate transactions and require the page to be reloaded between each action.

Modern web applications allow the items of a list to be created, updated and deleted in a browser without any interaction with the server or the underlying datastore. Therefore when the list is sent to the server side it must determine which items are new, which already exist and must be updated and which have been removed from the list and must be deleted.

One simple solution is to delete all of the items from the datastore and simply replace them with the list of line items passed from the browser to the server. There are at least two potential drawbacks with this approach:

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PAUL GRENYER
@pjgrenyer

“ A pattern can be thought of as a tried and tested way of doing something which can be applied in different contexts

1. If the datastore (such as a relational database) uses unique, numerical ids to identify each item in the list, the size of the ids can become very big, very quickly.
2. If the datastore (such as a relational database) has other data which references the ids of the items in the list, the items cannot be deleted without breaking the referential integrity.

Solution

The Single CrUD Transaction pattern gets around these drawbacks by performing three operations within a single transaction:

Delete all of the list items from the datastore whose ids are not in the list passed from the browser to the server.

Update each of the items in the datastore whose ids match ids in the list passed from the browser to the server.

Create new items in the datastore for each item in the list passed from the browser to the server which do not yet have ids.

Each action is executed within a single transaction so that if any individual action fails the list is returned to its original state.

Applicability

Use the Single CrUD transaction pattern when:

Datastores cannot have new items added, existing items updated and/or items removed in separate transactions.

Creating new ids for each item in the list each time the datastore is modified is expensive or cumbersome.

Removing all the items of a list from a datastore and recreating the list in the datastore breaks referential integrity.

Advantages and Disadvantages**Advantages**

Entire update happens within a single transaction.

Disadvantages

Three separate calls to the datastore within a single transaction.

Finally

I am lucky enough to work with some fantastically talented and intelligent people. Although I'm the boss, we work together in quite a flat hierarchy. This means I rarely get the last word. So being able have the last word in Norfolk Developers magazine is incredible for me.

PRACTICAL ADVICE FOR YOU AND YOUR START-UP



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A magazine by the Norfolk Developers for the tech community in Norfolk

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