DRTUNITIES

techUK Tech Connect Diary

Calum James, Principal Consultant Team Tomlinson

4 February - Launch Day

MEETING THE TEAM FOR AN EVEN MORE INSIGHTFUL DAY THAN I COULD HAVE ANTICIPATED

- It started with us meeting the teams we were assigned to.
- Two mentors: One from industry and one from government; at least two government employees who were tasked with presenting us problems to choose from; and a few people from different parts of industry (one person from development, a couple of account managers etc.).
- The team are great and we immediately started discussing the problems
 Felix and Eve from government had presented us, raising interesting points about the benefits and consequences of solving each problem.
- techUK published this article covering the launch.

PROBLEM STATEMENT DECIDED

"There are currently a great many citizen-government transactions that include to provision of documents from the citizen to the government. These processes tend to be paper based, which is costly, leaves a clear security risk, and extends the process time. Team will look at innovative ways of tackling those problems."

KEY TAKEAWAYS

- Sometimes it's very easy to start solutionising way too early, before the problem has been analysed enough. This helped me learn I have definitely been guilty of that before.
- In this case, based on the problem statement, some of us started assuming we'd be implementing something to allow citizens to scan their documents for verification using their phone, but the mentors helped us realise the actual problem is authentication rather than document verification. We were advised we will analyse the problem more thoroughly in the first Industry Day.

NEXT STEPS

Eve's Google Docs document

Eve created a brilliant document after this Industry Day and initiated the idea of us using Google Docs for easy and efficient collaboration.

The document included a wealth of information: Known research and case studies in the area of our problem; barriers; pain points; the benefits of the current system; things we could do next, using different approaches and patterns they utilise in government; and much more.

It was a great way to kick off our approach to the programme.

Dave creates WhatsApp group

Our mentor Dave set up a WhatsApp group for us to all communicate and collaborate easily and efficiently.

Team Tomlinson

Meet the Team

Meet the Mentors

Calum James Principal Consultant, Oracle

Eve Bayram Associate Designer, *Ministry of Justice.* Beverley George Head of Technology Services, HMRC

Dave Shave-Wall [Previously] CTO for Government, *IBM*

Felix Tomlinson [Previously] Business Analyst and Delivery Manager, Department for Business, Energy & Industrial Strategy. Sharon Moore CTO Public Sector UK, *IBM*

Gregory Simpson Account Manager, *Computacenter*

James Halliday Service Design Manager, *Department of Work and Pensions*

Sophie Norton Account Manager - Central Government, *BT*

Other Support

Louis Limon

Principal Data Consultant, Oracle Louis worked in an advisory capacity and helped with refining and maturing the team's ideas.

Simon Whatley

Service Designer, Ministry of Justice Simon used to work at Yoti and now works with Eve at the MoJ. He and Eve discussed our solution, and he helped us realise there was a gap in our proposal relating to how we would authenticate documents users upload.

Zeeshan Ahmed

Client Technical Architect, *IBM* Zee works with Dave as an architect at *IBM*. He generously agreed to be there to offer any architectural oversight we could have needed.

8 February - Industry Day 1 at IBM

A FASCINATING LOOK AT IBM'S WORK ON EMERGING TECHNOLOGIES, AND A USEFUL INTRODUCTION TO DESIGN THINKING

- The Industry Day was held at IBM's lovely Hursley House campus, which is a listed building. Visiting that place was a great experience!
- IBM began the day with a presentation on the work they are doing in emerging technologies, with brief explainers on technology like quantum computing and homomorphic encryption.
- After the presentation, different teams across IBM Hursley had set up workshops to demo and explain in more detail some of their work with IoT, digital assistants, AI, and ML.
- The design team hosted a brilliant session on Design Thinking after lunch, lasting until the end of the day.

PROBLEM REFINED

Our problem is really compelling because not only could a solution save both citizens and government time and money, the citizen currently has to send documents through the post which could be of much sentimental value, adding to their stress, worry, and general bad feelings during the whole process.

KEY TAKEAWAYS

- Design Thinking was new to me, so it's great to have a new tool in my arsenal.
- It's a great approach to unpack a problem and analyse the problem more.
- Identifying a persona, how that person is feeling at each stage of the process, and writing down both realistic and absurd solutions without even thinking allowed us to empathise with the subject more and think of various ideas that we could put togetherto form a solution.

THOUGHTS

This day was brilliant and full of useful information and techniques we can apply when analysing and solving future problems.

It was very interesting to see how a company as big as IBM operate and their focusses on emerging technologies.

NEXT STEPS

February 14 — Conference call

• We looked at what we'd learnt so far and what we'd achieved and decided to define some tasks for each of us to do ahead of an in-person meeting the day before the Industry Day.

• My task was to look at how industry deals with authentication, for which I did some research and created a useful document covering all sorts of authentication implementations and the technologies behind them. Similarly **Eve** was tasked with finding out how different government departments currently deal with authentication.

• We decided to create a Trello board to help track tasks, collaborate, and integrate with Google Docs throughout the programme.

February 21 — Team meeting before next Industry Day

• We decided to meet up to further identify all the different types of documents or services citizens might request from the government, along with the different types of citizens who may require government services.

• This allowed us to determine just how broad our solution should perhaps be, catering for well-known services (e.g. claiming disability benefit) to the more obscure things (e.g. obtaining a fishing licence).

22 February - Industry Day 2 at Fujitsu

SOMETHING TWIGGED AND OUR POSSIBLE SOLUTION JUST BECAME EVEN MORE · INTERESTING

- As with IBM, the day began with Fujitsu presenting on some of the different things they are helping with in AI, ML, and other emerging technologies.
- The most relevant talk for us was their presentation on their work with the Estonian government to help them create a digital society. Estonia's digital capabilities are the best of any government in the world.
- The afternoon focused on Design Thinking, just like IBM's afternoon; however, we engaged in some slightly different activities.
- The Design Thinking session allowed us to explore possible solutions a Industry Day bit more than the IBM afternoon. Inspired by the Estonian government's efforts, we refined the problem to become more of a digital repository for a particular citizen over time.

SOLUTION CONCEIVED

Rather than merely thinking of a solution to solve the authentication of citizens for government services, we asked ourselves what could be done if the physical document weren't even a component we had to worry about. Why are we still thinking in terms of documents—a concept created to help verify entitlement in the physical world?

We envisioned a "from the cradle to the grave" system: From the moment a citizen is born, life events are added to their government timeline to create a verified central source of truth as to what they're entitled to. This would not only ensure the government could confirm if a citizen is entitled to a particular service or benefit, it could help prevent fraud (because income, employment, and benefit applications would all be in one place), among other benefits.

Is there even a need for "documents" in such a digital solution? The representative adding the data point could simply verify the user is entitled (e.g. they're entitled to drive), with no need to print, send, or even create a document related to that.

KEY TAKEAWAYS

- Al can be added to existing technology (e.g. Fujitsu's work with identifying parking spaces using an existing CCTV system).
- The Estonian government only had \$400,000 to start their new digital society and they still managed to create the innovative thing they have today, with help from Fujitsu and others.

NEXT STEPS

27 February — Conference call catchup with the team

- Again we decided to think of some tasks ahead of a meeting before the next Industry Day.
- It made sense for us to see what technology is behind Estonia's digital society, so that was my task.
- Meanwhile, Felix had found a recently published techUK whitepaper on how the government could perhaps handle digital identity, so Sophie is going to read that and pull out key points so we can see how different or similar it may be to our solution. A quick scan of the proposals suggest it's different to our idea.

7 March — Team meeting before Industry Day

- We mapped out the flows for different processes citizens go through in order to secure access to benefits or government services, from what the citizen has to do to what the government has to do.
- This highlighted the required versatility of our solution.
- This meeting allowed us to uncover even more benefits and innovative things our solution could do, going into the Industry Day with Yoti who are in a similar space.
- Further, we realised some documents the government ask for or use don't come from the government themselves (e.g. proof of address), so that might inform the shape of our solution.

8 March - Industry Day 3 at Yoti

YOTI'S VISION IS VERY SIMILAR TO OURS, SO THIS HAS BEEN A BRILLIANTLY USEFUL INDUSTRY DAY

- Yoti began the day with presentations on what they are about, their vision, their processes, their security and privacy focusses, and how they're creating and fostering trust in them.
- After lunch, Yoti demonstrated to us some of the technologies they are refining: Age estimation and verification at point of sale using selfservice tills with cameras, and their digital signing tech.
- The rest of the afternoon was slightly different to the previous Industry Days: We were given time to sit in our teams to further refine our solution. This was very useful for us because Yoti are doing similar things to what we have envisioned, so we had a lot of questions for them.

SOLUTION REFINED EVEN MORE

Based on our meeting the day before, we confirmed the "from the cradle to the grave" idea would be the future of our solution: The place we would like to eventually be at.

It's not realistic to implement a solution that disruptive in all government departments promptly, so our intermediate solution will use technologies like OCR, hashing, and perhaps Yoti's APIs to verify existing and new citizens as they scan documents in, building up their timelines over time.

Eventually, when a new life event occurs (a birth, passing a driving test, opening a bank account, wanting to obtain a fishing licence, a death etc.), the appropriate person will mark that on the user's timeline and they won't need to receive an official document. We'll perhaps implement this long-term solution department by department within government.

KEY TAKEAWAYS

- We cannot just think about the end product: We have to consider the journey to it.
- Yoti have some brilliant ideas that will really help with our proposal (e.g. Yoti Connections).
- Government can work with private companies when the data involved is sensitive.
- Yoti follow best security practices to ensure users' data is safe.
- They have plans in place to prove to users they can be trusted with their data.

THOUGHTS

Yoti are solving a very important problem: Payments are now digitised, but we still have to carry physical ID. We no longer need a wallet for loyalty cards, bank cards, or anything else ... except ID.

Not only that, but there isn't currently a standard, accepted digital ID solution for more important situations.

In a similar way to how they approached digital identity, Yoti have found ways to improve document signing that better competition who have been in that space for decades.

It was insightful to see how a startup is working to solve one of the most important problems that not only requires citizens to buy into it but also has to drive change in legislation and could perhaps involve partnerships with the government.

22 March - Industry Day 4 at Pivotal

PIVOTAL IS AN INNOVATIVE DELL TECHNOLOGIES COMPANY OFFERING OTHER COMPANIES A PROVEN WAY TO ACCELERATE ORGANISATIONAL CHANGE

- Pivotal began with a few presentations on the work both Dell and they are doing.
- There is some great innovation coming out of Dell's hubs.
- "Internet of Cows": Dell helped improve the milk yield per animal by monitoring the feeding and breeding of cows via RFID sensors. Farmers were able to make better decisions when data about cows' eating, health, and milk production was made available via mobile devices.
- Pivital themselves are transforming how software is built in order to ensure companies deliver exceptional products.
- Mitchel Seaman, Associate Director, Product Management took us through Pivotal's processes and approaches in more detail.
- As with the previous Industry Day, we were given time in the afternoon to work on our idea.
- Eve had created a user journey—with pain points and opportunities .
 mapped onto it—which we all found very useful and decided to print out on A1 paper to display behind us while presenting on Finale Day.
- We picked out just one box on that user journey that epitomises our problem, which we can focus the presentation on.

THE BEGINNING OF THE PROTOTYPES

We decided it would be best to supplement our presentation on Finale Day with some prototypes.

Our solution is more than just an app and backend services; we will also offer some shared components that can be used throughout government.

During this Industry Day we decided to make three different prototypes: The form for uploading a document to the vault, the screen different government departments will use to ask the user for permission to access their document in the vault, and the timeline for the long-term vision.

KEY TAKEAWAYS

- Pivotal solely utilise extreme programming, and in particular pair programming, as a technique to maximise productivity and ensure knowledge sharing.
- They want the end-to-end product development process to be a core competency of organisations.
- Lean engineering practices, user-centered design, and self-organising agile teams are key to Pivotal's approach in helping customers ship great software faster.
- Pivotal use 'balanced teams', which are small teams involving people from design, development, product management etc., focussing on collaboration, consistent communication, and transparency. A bit like our Tech Connect team.
- Do not start a project with a fixed scope or solution. Minimise product and development risk up-front.
- Short feedback loops help you understand if you're heading in the right direction.

NEXT STEPS

Eve's meeting with Simon

Simon and Eve discussed our solution, and he helped us realise there was a gap in our proposal relating to how we would authenticate documents users upload.

Eve's resulting diagram

Based on her conversation with Simon, Eve made an architectural diagram of the flow of authentication for eligibility to a government service.

Greg's architecture diagram

Based on what we drew on the whiteboard during this Industry Day, Greg made an architectural diagram of the proposed solution process flow for the user authorising release of information to the government and a government department requesting access to the citizen's vault of documents.

Start thinking about prototypes

5 April - Industry Day 5 at Computacenter

COMPUTACENTER ARE INNOVATING IN VARIOUS PARTS OF THE DIGITAL SPACE

- Several people from Computacenter presented on what the company do and all the different parts of digital they have their feet in.
- Lizee Butler, HR Business Partner presented on the six pillars of how they do what they do: Investing in the UK's future tech talent; operating ethically and inclusively; delivering outcomes to improve the citizen NEXT STEPS experience; protecting their customers from security threats; engaging in a commercially open and transparent manner; collaborating with organisations-small, medium, and large.
- Computacenter gave us a great tour of their facility, including a look at their automated handling systems facilitating fast and efficient storage, order picking, and replenishment.
- We had the entire afternoon to work on our project again at this Industry Day.
- Employees from Computacenter visited each of the tables offering advice and help.

SLIDESHOW TAKES SHAPE

With the guidance of our mentor Dave, we decided to focus on getting much of the slideshow done, to ensure we had the general structure down and a great story to tell; prepared weeks before we present.

Sophie helped find high-res images for the slides and Eve and Felix drew overall diagrams of our long-term vision and the short-term approach of how we'll get there.

KEY TAKEAWAYS

- Computacenter have organically grown from a UK SME to a FTSE 250 IT company.
- Partnering and collaborating with smaller businesses is crucial for a large company like Computacenter.
- Dave helped instil in us an appreciation of telling a good story to help present both a problem and proposed solution.
- It's important to get the general structure of a presentation down way before it's to be shown, filling in the gaps and evolving it.
- Overloading slides with information will just distract from what we're saying and make the presentation feel busy. We can evocatively get across our story with simple visuals as an aid to what we're saying.
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THOUGHTS

It's been great to have time to focus on our project in our team over the last few Industry Days. We've been able to collaborate and progress very effectively together.

The tour around the facility was fascinating and it was interesting to learn about the impact Computacenter has had on technology we all use daily.

Iterate on prototypes

Before our next meeting on April 18, those of us knocking up prototypes will share our progress with the team regularly to get feedback and iterate on what we have in order to refine it.

Continue presentation

Some of the team will continue building out the slides we're presenting and writing notes on what we're going to say.

April 18 — In-person team meeting to practice presentation

We'll meet a couple of weeks after this Industry Day in order to practice our presentation and ensure we know what we're going to say and show.

Dave had the great idea that we could decide what and how we're going to present, practice it, then he could visit later on to see the presentation from the point of view of an audience member, to give us feedback on what we feel is our finished story.

April 25 — Final run-through

We'll meet a final time before Finale Day to ensure everything is finished and polished to the point we're happy.

April 29 — Finale Day

Tech Connect's Finale Day will give us great insight into the work Government Digital Services do, along with a tour of their site; allow us to pitch our idea; and give us the opportunity to present on our experiences and thoughts of the programme.

Thoughts before Finale Day

The Industry Days have been a brilliant accompaniment to the programme. I couldn't have asked for more friendly, hardworking, and brilliant teammates and mentors.

We have learnt about how different industry leaders and budding new startups operate and approach problems, and the different parts of digital they are working in. Our mentors have provided us with excellent feedback, suggestions, and insight, and the entire team has become more and more enthusiastic as the programme has progressed.

I am very excited for the next few weeks as we build out our prototypes, finish the slideshow, polish our story, and present at an insightful and fun ending to the programme.

29 April - Finale Day

A TOUR AROUND GDS, SOME TALKS, AND OUR PRESENTATIONS

- Kevin Cunnington (Director General, Government Digital Service)
 kicked off the day with a talk and an opportunity for us to share our experiences.
- We were given a tour around the GDS (Government Digital Service) office.
- They showed us the new digital fishing licence and the approach they're taking to attract people to go digital for it.
- GDS introduced us to the Data Science Accelerator, which is a great programme that allows government employees to gain experience with data science, benefitting their department.

WE WON!

Our presentation was a great success and we won, along with the Independence Pay team.

KEY TAKEAWAYS

- One of the biggest challenges in government is how to get a service working for everyone.
- Even though they have to cater to all citizens no matter what technology (or lack thereof) they use, GDS are still doing things with emerging technologies like artificial intelligence, deep learning, machine learning, natural language processing, graph analysis, and voice assistant integration.
- The government used to have as many as 1,800 different websites, each with their own design and own hosting, all coded from scratch. GDS brought all of that together into one design language, set of libraries, and overall consistent approach. Further, they brought development in-house. This has helped GDS save over £60 million so far.
- GDS ensure services meet certain standards before they're published on GOV.UK, to ensure quality, usability, and accessibility.
- As with many companies in industry, GOV.UK utilises A/B testing to help GDS improve their offerings.
- Being the government, the ethics around AI are a very important consideration.
- Al can help in some crucial areas; for example, finding deterioration in roads before they become potholes. Voice assistant integration can help people perform their tasks more quickly; for example, telling Alexa a registration plate and hearing back when the tax and MOT are due. Supervised learning was used to tag content on GOV.UK when GDS saw how long manual tagging was taking.
- GDS are making use of chatbots, which is one of Oracle's key areas.

THOUGHTS

This was an excellent conclusion to a brilliant 12 weeks.

NEXT STEPS

- A discussion with John Manzoni, Chief Executive of the Civil Service and Permanent Secretary -Cabinet Office to go through our challenge and our experiences on the programme.
- Being invited to attend the GDS Sprint event this year.

Final Thoughts

TechConnect was an invaluable experience for me to see how industry and government work together to solve problems and innovate. Winning was the icing on the cake!

The structure of the programme allowed me to meet and work with some brilliant people across both industry and government, and the Industry Days gave me great insight into how different companies approach software development and emerging technology.

The mentorship helped me refine my approaches to problems, solutions, and presenting, and the Industry Days taught me new techniques, like design thinking; all of which I can take back to my day-to-day work.

The team was cohesive and they were great to work with! I am very excited for us to discuss the challenge and programme with John Manzoni and attend Sprint 19!

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