Bulletin

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Summer 2021

Disruptive Innovators Network

UNDER THE
BONNET

New advances in tackling E&D, sustainable innovation, stock condition surveys and data quality

Ian Wright
Disruptive Innovators Network

So, what have we brought together for you in this edition?

The need to improve data quality has been a recurrent theme of DIN's work with the housing sector. In this Bulletin we look 'under the bonnet' at how external expertise can assist providers to improve the data they use to make business decisions.

We focus on two sources of expertise — an established UK consultancy with a strong track record in data management and analysis (3C Consultants) and a young company emerging from the Netherlands with a radical new solution for collecting stock condition data (Spotr.ai). We take a deep dive into how these companies actually deliver their services — hence the term 'under the bonnet'.

Equality and diversity are as important to DIN as it is to our members. In this Bulletin we interview Ezechi Britton, co-founder of Code Untapped, to explore why women and people of colour are under-represented in ICT and how the sector can engage with his organisation to identify and recruit talent from these communities.

We also explore, with Charlie Tuxworth, why innovation fails in organisations and how it can be made sustainable by adopting an Innovation Management System and meeting international accreditation standards. If formalising innovation appears to be counter intuitive, read the article and you may be persuaded otherwise.

As always, we are keen to hear from you about what you think of the Bulletin and what it should cover in future issues.
— *Ian*

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TALENT WITHOUT BORDERS

Talent knows no borders and ability is evenly distributed but opportunity is not equal: the case for diversity in ICT teams

An interview with Ezechi Britton: Tech Founder, Early-stage Investor and NED

Social housing providers are working hard to diversify their workforce, but ICT teams often remain the province of white men. Why does this matter and what can be done about it? The inspirational Ezechi Britton suggests some answers. These answers are rooted in Ezechi's personal story, which is where we begin.

Part 1: Ezechi's story

Failed your A-levels? What are you going to do about it?

I grew up in Lewisham, in southeast London, and attended a state secondary school where the five GCSE pass grade rate was only 14%. My immediate peer group was not focused on educational attainment, or even success.

Fortunately, both my parents were teachers. Their whole focus was on 'educate, level up and make your own way'. But what pathway would I take?

As a young child, I developed a strong interest in technology, largely from video games. It led me to do computing A level, where I started to learn to programme properly. Then I failed my A levels! I lost my place at the University of Manchester.

The phrase "what are you going to do about it?" has become a core part of my belief system

I remember telling my dad that I was going to fail. He did not shout or scream. He simply said, "so what are you going to do about it?" That got me thinking. I re-sat my A levels and did just well enough to get a place at the University of Kent, which offered a year's placement in industry, and I captained the university karate team. Since then, the phrase "what are you going to do about it?" has become a core part of my belief system.

Convincing Lehman Brothers of my potential

Accessing that year's placement in industry was to prove another challenge. My A-level track record put a lot of companies off. I was amongst the last three of over 200 computer science students to be offered a placement.

I was so nervous. Like many people from minority backgrounds, I had never set foot in an investment bank or indeed any corporate environment before.

But they saw past all this. They saw a highly enthusiastic young man who understood his subject matter, who had prepared well and even had the confidence to tell them about Lehman Brothers stock value and report broken links on its website. They offered me a job that evening. I was to earn £26,000. My highest paid job up until that point paid £3.40 an hour. I was in shock.

Success at Lehman Brothers and Credit Suisse

After graduation, I joined Lehman Brothers full-time in 2004 as a Graduate Software Developer and stayed for five years, becoming a Senior Software Developer. Lehman Brothers was a tough but enjoyable work environment. But for me it involved an entirely new world with new norms, new manners, and new ways of speaking.

From a racial perspective, it was a bit lonely. Lehman Brothers had started actively recruiting from the BAME community, but that was still it was 'a new thing' and there were a few of us around on the tech side and not many more in the banking operation.

Given my background, it was a challenge to adapt to this environment. However, I found that I possessed an 'innate authority' attained through years of teaching martial arts to people who are a lot older than me. That, and the fact that I am a naturally adaptive individual, helped me surmount all the barriers I faced.

I learned a huge amount. Suddenly, the horizons that opened to me were massive. It was like stepping through the looking glass. In 2009 the looking glass led me to Switzerland and a new role with Credit Suisse as Senior Software Developer and analyst responsible for software development, business analysis and project planning.

Working at Credit Suisse involved learning another new language (literally), new social norms and a whole new way of living. Becoming European was critical to my personal growth. I would recommend it to anyone. It was an exciting time and I stayed for five years.

I was fortunate in having this variety of work experience as it helped me to develop resilience and self-belief. But not everyone from a background such as mine will be so lucky. It disturbs me that they require that level of exposure to different experiences to succeed when people from more privileged backgrounds appear not to need it.

My first steps as a tech-based start-up founder

From the age of 18, I had wanted to set up and run my own technology business. That desire never left me.

Then, when I was in my fifth year at Credit Suisse, Martin Ijaha (an ex-colleague from my Lehman days) asked me to be a co-founder of a new business he was setting up. Although I was enjoying my well-paid job at Credit Suisse, I had hit a 'glass ceiling' in career progression. So, I agreed to join Martin, moved back to my parent's home in London and worked for a year for nothing to help him set up Neyber.

From 2014 to 2019, I was CTO (and later a NED) of Neyber. Neyber partners with employers to support their workforce's financial wellbeing with access to affordable, salary-deducted loans and financial education insights — all at no cost or risk to the employer. It has raised over £200 million in capital and lent over £170 million to UK-based employees.

After five years, however, the exhilaration of setting up the business had dissipated, and I moved to a NED role and eventually exited the company.

Founding *Code Untapped*

With my new-found freedom to think, I decided to set up a business which would help people like me to get work in the field of technology. I understood that under-represented groups were being held back by lack of tech skills, the cash required to study for them and the networks that lead to employment opportunities. Of these factors, acquiring tech skills is critical as it is the key to setting up a new tech business.

So, in 2018, Jason Halstead and I founded *Code Untapped* as a digital skills accelerator and 'shop window' for under-represented technologists.

When we talk about diversity in this context, we mean gender, race, class and cultural background. We work with technologists from all these groups.

Code Untapped works with companies to help them find innovation through diversity. We have now entered a joint venture called Code Untapped Partners with Mindscape. Mindscape offer a learning platform for would-be technologists and enables companies to hire tech development teams comprised of trained technologists, whom they can select individually from the Mindscape database.

Founding Impact X

My greatest satisfaction is in the process of 'bootstrapping' businesses to get them off the ground and helping others to do so. So, in 2019, I became a founding member of Impact X, a double bottom line venture capital company, founded to support under-represented entrepreneurs across Europe particularly the Afro-Caribbean diaspora.

Impact X is in the process of raising over £100 million in venture capital. We use this capital to fund ventures at Seed, Series A and Series B stages. Our aim is to represent entrepreneurs within the entertainment, media, tech and creative industries.

Part 2: Inequality in the UK tech workplace

The first UK tech workplace equality report, published in 2019 by the ICT recruitment agency *Hired*, provides clear evidence that women and minority groups are being consistently denied equality of access to jobs in technology.

***Hired* discovered that the proportion of female candidates being interviewed for technology positions was as follows:**
- All tech roles 18%
- Software engineering 14%
- Data analytics 23%
- Product management 33%
- Design 36%

Hired discovered that women are also paid between 4% (all tech roles) and 12% (design) less than men in equivalent roles.

Ezechi says:
We are still not seeing enough women in the engineering recruitment pipeline. Our lab days attract more female engineers than male, so the talent is there if employers want to look for it.

The benefits of a diverse ICT workforce
I think that the key issues are innovation and relevancy. A common thread, when businesses talk about innovation, is 'we need people to think outside the box' to come up with new and innovative ideas. But if you hire a team that all live inside the box, and it is the same box, you are simply limiting your opportunities for innovation. Diversity, in this context, is not just about race. Its broader than that, encompassing diversity in class or cultural background.

Innovation succeeds where it inclusively accommodates different ways of thinking and different experiences that, when combined, bring different viewpoints as well as different levels of challenge. The more diverse the workforce, the better understanding a company has of its customer base. If we understand our customer base, we can provide better solutions.

[1] *https://hired.com/uk/uk-tech-workplace-report/#key-findings*

***Hired* also found that the racial composition of the UK tech workforce was as follows**
- White 65%
- Asian 17%
- Mixed/multiple 6%
- Black (African and Afro-Caribbean) 3%
- Other 3%
- No reply 4%

Ezechi says:
This data tells me that inequality, in terms of access to ICT employment, is not experienced equally amongst BAME communities. We see the same thing in schooling where BAME students from non-Afro-Caribbean backgrounds outperform from Afro-Caribbean backgrounds. Moreover, given that tech companies tend to be based in urban centres, the hiring statistics are even worse than they appear.

You can be as innovative as you like, but if that innovation is not relevant to your customer base it is likely to become a pointless and expensive waste of money. I have seen this in Fintech, where a key objective is to tackle financial inclusion by widening access to banking and credit for the 11 million UK citizens currently without both. But how can you understand financial inclusion if you have never been financially excluded? Will you have the deep understanding of the user experience required to solve problems? And will the products that you are building really meet need?

When the people you employ have experienced these challenges, you develop a motivated workforce that wants to solve people's problems as opposed to people who are just getting a salary. And that is just as important in your technology workers as it is with housing directors and tenancy managers.

Getting recruitment and retention right

So why are women and people of colour under-represented in technology and innovation? And what are the solutions to this problem?

Recruitment is a time-consuming and expensive business. In ICT, appointing the wrong candidate can quickly impact on the overall performance of the business. So, recruiters play safe and recruit in their own image. CVs feel similar and comfortable where they follow the expected pattern of education, qualifications and ascending seniority of job roles. They are genuinely trying to hire the 'best people' but do so in a way that narrows their pool of talent. Instead, they should be widening their search as much as possible. Because the reality is, talent knows no borders, and ability is equally distributed.

Getting people from under-represented groups to apply for ICT jobs is another issue. Companies are always asking me about the optimum outreach strategy. Negative self-selection deters many a potential applicant. Look at me. I have deep technical expertise, a broad professional network and a variety of skill sets. My businesses have raised over £300 million in capital. But when a colleague suggested that I apply for a job at a large well-known technology engineering firm, I said "what's the point? They don't employ people who look like me".

And when under-represented talent is appointed, they are often so isolated and uncomfortable that they leave. For example, a black woman walks into an all-white male ICT team and within two weeks she leaves. She quits because she is isolated and lonely — there is not enough diversity in the team to welcome diverse people in. This 'revolving door of talent' is extremely time-consuming and expensive.

I think the key solutions are as follows:
- appoint people like us and make sure that they are visible to customers and potential employees
- ensure that all ICT recruitment involves BAME personnel or Board members
- scrutinise recruitment processes to eliminate conscious or unconscious bias
- mentor new BAME ICT staff to check on loneliness and isolation and address it
- reach out to under-represented talent before commencing the recruitment process

Part 3: Code Untapped and its offer to the sector

Our mission at Code Untapped is to give under-represented technologists a voice and to help them find meaningful employment. And we do that through creating a community, putting on events, connecting the community to partner businesses.

We enable these businesses to see for themselves the value of recruiting ICT staff from diverse backgrounds. They can observe under-represented talent in action tackling problems as a precursor to potentially recruiting them.

We do that through a series of ways
Our direct community now involves over 750 technologists and through our partnerships with like-minded organisations like YSYS, we are now connected to around 12,000 people.

Through our workshops and innovation labs, we provide the opportunity for individuals to upskill around product development, programming and so on.

We offer full day hackathons involving Code Untapped talent to companies with problems to solve. We have recently delivered hackathons for the Department of Education, Amido and Vanquis Bank.

We help businesses develop 'junior squads' of ICT development teams, as an auxiliary resource where they have a 'greenfield project' that needs a fresh and diverse set of problem-solving tech perspectives. Companies have deployed our 'junior squads' to tackle issues such as digital transformation, cloud migration and digital engagement with 'hard to reach' customer groups.

We are currently being asked by businesses to consider whether we can secure internships for members of the Code Untapped community. There is a role for us here, but I do not want Code Untapped to become another recruitment agency. I would rather create a digital platform whereby we provide exposure to those individuals so that those organisations can access them themselves.

Companies can observe Code Untapped talent in action — which can lead to offers of time-limited placements or permanent roles at the client organisation. We charge for placements (not least because we provide ongoing Academy training for the technologist) but there is no fee where a client offers one of our technologists a full-time job.

For employers, it is almost 'try before you buy'. You get access to young, hungry and capable individuals. If you choose to employ them, they have been trained in how you work and understand what you do.

Remember, talent knows no borders. If you want to develop the best talent for your business, contact us.

Contact
Email: ezechi.britton@codeuntaped.com
Website: www.codeuntapped.com
LinkedIn: https://www.linkedin.com/in/ezechi-britton-452a893/

SYSTEMATIC MANAGEMENT OF INNOVATION

An interview with Charlie Tuxworth, a software engineer who became a Director of Innovation and now writes international innovation standards

My background is in software engineering. I joined the enterprise software provider ICS in the mid 90s — which was then the largest indigenous IT company in Belfast. I started in a junior position and ended up running the company's software team, growing it from 25 people up to around 150 based in Belfast and India.

The company was acquired by a UK financial services PLC, and I joined the senior leadership team before being appointed as Director of Innovation in late 2013. I was part of a team of two in an organisation of around 4000 staff and our brief was very simple — 'make the company more innovative.' There was no definition of what that meant and no clear outline as such on how we should go about it.

We spent a lot of time learning about innovation and, like most people do, we initially focused on ideation — the generation of ideas to develop new products and services. We ran online ideation campaigns, used creativity techniques, ran design sprints and design thinking workshops, and we worked with business partners and fintech start-ups to identify new technologies that we could make use of.

Despite early successes, we struggled to gain real traction. The ideas that we created with, and for, the operational teams were never a priority, and we realised that this was because innovation was simply not a business imperative. I now understand that for innovation to be fully embraced by an organisation as a core discipline it needs to move beyond tactical ad-hoc activities and be systematically managed and aligned to corporate objectives and targets.

I began to look outside my organisation for new insights and stimuli. I joined the advisory board for CSIT (Queens University Belfast's Centre for Secure Information Technology) and helped set up and deliver its Cyber Innovation Lab. I became a regular guest speaker at events and on University MBA courses and I deliver mentoring and innovation content through the UK government Cyber101 and Digital Catapult programmes. For many years I have been an 'Entrepreneur in Residence' at Catalyst Inc — helping innovative start-ups to develop and commercialise their products and secure external investment. During the COVID lockdown, I founded *Innovate Island* — an all-Ireland go-to community for practitioners, advocates, and explorers of innovation.

For the last few years, I have been heavily involved in setting standards for innovation. I worked on the development and verification of the EQFM Innovation Excellence Model. I was also involved in the roll out of the ISO 56002:2019 Innovation Management Systems Guidance — created by the standards bodies of 43 countries. ISO56002 sets the independent and international standard for what good looks like when it comes to innovation.

As a member of the National Standards Authority for Ireland (NSAI) task force I was asked to write the plain-language introduction to the innovation handbook that ISO and the United Nations Industrial Development Organisation (UNIDO) are publishing this year.

I am currently writing ISO56001 as part of the international ISO working group, which is taking the ISO56002 content and from it creating a certifiable standard for Innovation Management.

Organisations will invest in 'innovation theatre', in the hope that putting on a display of innovation will meet the expectations of shareholders, or simply make the business look modern and dynamic

My personal objectives are now to help organisations to align their innovation activities to the corporate vision and strategy; to support teams in building the capability and confidence to innovate; to enable organisations to embrace the unknown, harness creative energy, and convert that into innovative thinking that realises significant value back into the organisation. What follows is what I have learned about the practice of innovation in an established business

Innovation is not sustainable if confined to ad-hoc tactical activity
Organisations often invest in short term innovation to exploit a specific opportunity or to solve a particular problem that is threatening their effectiveness or viability.

In other cases, organisations will invest in 'innovation theatre', in the hope that putting on a display of innovation will meet the expectations of shareholders, or simply make the business look modern and dynamic.

While innovation theatre adds little or no real value, tactical interventions can be extremely valuable and effective as one-off activities, but they will not make innovation 'sticky'. By this I mean innovation that is sustainable and scalable.

Innovation will only be sustainable if strategically aligned to the corporate business plan

In most businesses over a certain size, key workstreams such as sales, marketing and HR will have specific operational strategies which align with, and deliver against, the overall corporate strategy.

This does not tend to happen when it comes to innovation. It is still extremely rare to find a comprehensive innovation strategy that operates in a similar manner. As a result, the value of innovation often remains undefined, making it extremely difficult to secure the resources required to execute innovation effectively (time, money, or equipment).

Innovation requires leadership at a senior level

Innovation needs to be led by a passionate advocate at executive team level. If the CEO and executive team do not 'get' the need for innovation, then novel ideas will be knocked down at every opportunity, simply because they appear to challenge the 'way things are done around here'.

It is not always necessary to set up a specific innovation department. In fact, its existence can lead operational teams to believe that innovation is not their responsibility. I have experienced this myself with sales teams sending me tender documents shortly before deadline with a request to quickly 'add some innovation sparkle'!

The chances of success are also improved when innovation is co-ordinated by a team that has a direct access to the executive sponsor for innovation.

Employee education on innovation is vital

People across the business need to understand what innovation involves, why they are doing it, the risks involved, and the challenges they are likely to face. They need guidance on all aspects of innovation.
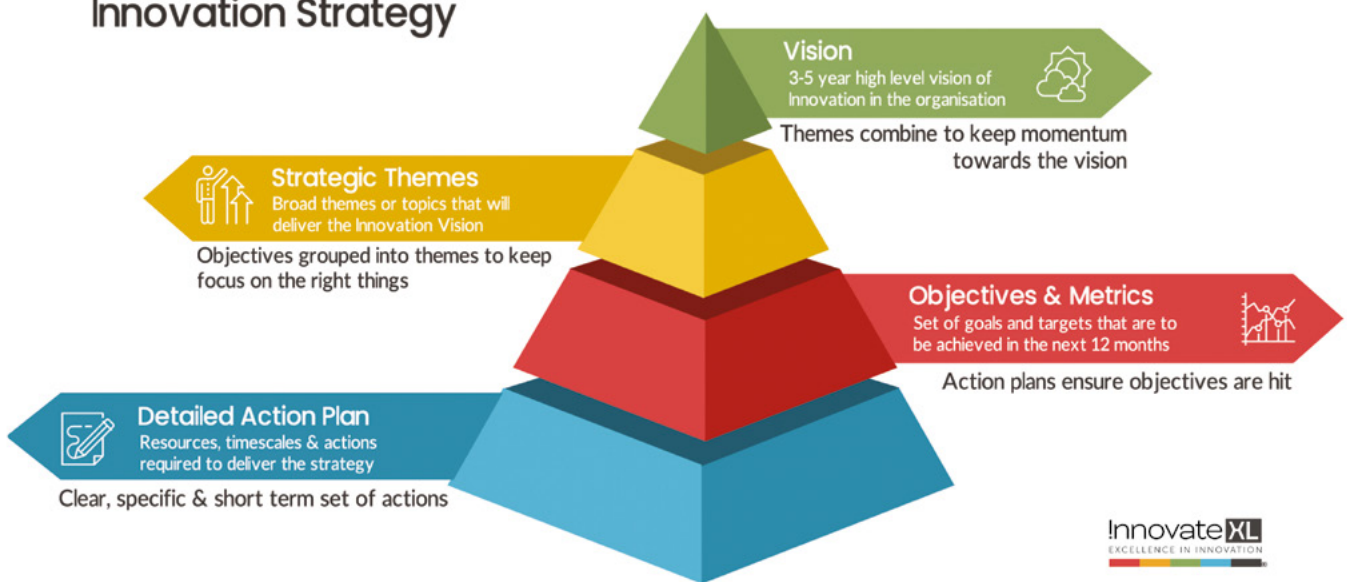
Whilst perhaps not an obvious solution for a discipline such as innovation, high quality eLearning is an efficient and economical way of 'levelling up' the capability and confidence of employees before they get involved in innovation workshops and initiatives.

Staff need permission to innovate

It can be difficult to break the mould because we are all too often rewarded and recognised for adhering to the status quo. Fortunately, there are a wide range of creativity and ideation techniques we can use to tap into our innate ability to think differently.

Skills aside, staff need to be given explicit permission to think differently and challenge the organisational norms. Otherwise, they will always tend towards safe options that they think the bosses want to hear.

Foundations of Innovation Strategy

Vision — 3-5 year high level vision of Innovation in the organisation
Themes combine to keep momentum towards the vision

Strategic Themes — Broad themes or topics that will deliver the Innovation Vision
Objectives grouped into themes to keep focus on the right things

Objectives & Metrics — Set of goals and targets that are to be achieved in the next 12 months
Action plans ensure objectives are hit

Detailed Action Plan — Resources, timescales & actions required to deliver the strategy
Clear, specific & short term set of actions

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Lack of specialist innovation personnel is a major problem
A good innovation professional should not 'parachute in' to address a business challenge. Instead, they should share their knowledge and experience across the organisation. To paraphrase a cliché, innovation professionals should not be selling fish, they should be teaching others how to catch fish.

Unfortunately, there are very few innovation professionals out there. Many who claim to be one are only skilled in — at best — a handful of idea generation techniques. Ideation is indeed critical to innovation, but it is important to remember that it is only one aspect of innovation!

Business transformation professionals are often given innovation roles, but the skills required are quite different. Restructuring a business, migrating data to new systems, and improving service delivery are essential tasks, but that approach of making things better, quicker, or cheaper involves a different mindset to the 'blue sky thinking' world of doing things differently or doing different things. Recognising this problem, I founded Innovate Island as personal side project during lockdown. It is a non-commercial network of innovation professionals across Northern Ireland and the Republic of Ireland.

Innovate Island aims to professionalise the Irish innovation industry and to represent our members' views and aspirations as we engage with government, support agencies, and policy makers. Since its launch almost 250 people have joined and meet regularly to learn and share knowledge and good practice.

Innovation requires a systematic approach
To some people, the idea of taking a systematic approach to innovation appears counter intuitive. Surely it will stifle creativity and the freedom that innovation requires? Drawing upon my 20+ years driving change and innovation, I would suggest that this is not a valid concern. In fact, a level of formality is essential.

Long term innovation will only succeed if it is a business imperative, and this can only happen if ideas generated have a clear and direct impact on corporate goals. This can be best achieved by having a comprehensive innovation strategy that feeds into and supports the corporate business strategy.

The lack of a structured approach can lead to an over-focus on ideation relative to other key elements in the process. Whilst I would agree that if you do not have ideas you cannot innovate — I would add that if you only have ideas, and fail to develop and bring them to market, then you do not have innovation. The ability to bring ideas to fruition sits at the heart of innovation.

This is where an Innovation Management System (IMS) comes into play. An IMS introduces the systematic approach and structure that a business needs if it is to embed innovation within the day-to-day operations, and systematically develop new or improved products and services.

An Innovation Management System introduces the systematic approach and structure that a business needs if it is to embed innovation

An IMS should not be prescriptive regarding the actual innovation techniques or tactics deployed. Instead, it should force a business to ask itself questions around the support and resources that the innovation activities need.

For example, has the business considered the risks of innovation? Does it have the necessary resources in place to deliver innovation? Has it ensured that staff, Board and involved partners or customers been educated on innovation? Fundamentally, is it a company genuinely committed to innovation?

The key elements of a quality IMS are:
- Leadership and Planning
- Operational Delivery
- Capability
- Assessment and Improvement
- Organisational context

Working within an IMS framework helps build a picture of what 'good' looks like for the organisation — a vital first step before ideation activity begins. The IMS provides transparent and objective data demonstrating which corporate teams have embraced innovation and which are not engaging or are actively resisting change.

Deploying a quality IMS enables a business to develop a vision, strategic themes, key objectives and supporting action plans — and other strategic aspects required to develop an 'innovation roadmap' for the next three to five years.

Boards need to be able to challenge the executive team with questions like 'why have no new products been developed this year?'

An IMS provides a set of components and a common framework to develop and deploy innovation capabilities, evaluate performance, and achieve the desired innovation outcomes.

In general, any IMS should:

- ensure that the organisation understands innovation and how best to deliver it within its operational context
- complement ideation and creativity to make an innovation programme 'sticky', sustainable and scalable
- make innovation a priority, taken seriously by the executive and Board as a core business activity
- provide justification (including Return on Investment) for the innovation programme

The benefits of introducing an IMS include:

- setting a clear direction for innovation in the business
- identifying the resources required to support innovation activities
- establishing the KPIs and metrics upon which innovation is measured
- outlining the processes needed to continuously improve the innovation programme
- highlighting aspects of the organisational culture that need to be 'tweaked' to ensure that innovation flourishes

Searching for an Innovation Management System on the internet will generate any number of hits. Buyer beware — many of these are from suppliers of ideation tools and often only address the generation and commercialisation of ideas. So, they might be better described as Idea Management Systems. Many are very good at what they do, but my advice is to choose an IMS that addresses all areas of innovation, not just ideation.

A good IMS will be fully aligned to all aspects of a formal definition of 'what good looks like' such as ISO56002:2019 Guidance for Innovation Management Systems.

Innovation activity needs to be measured and subject to scrutiny

Corporate KPI's must include innovation targets that can be monitored at Board level, ensuring that the executive team is being held to account for innovation performance. Boards need to be able to challenge the executive team with questions like 'why have no new products been developed this year?' or 'why have only two innovation challenges been undertaken when the annual target is five?'

Capability
Building the skills, confidence and knowledge needed to deliver innovation

Delivery
Providing the resources need to generate ideas through creativity and collaboration

Assessment & Improvement
Setting the standard for a structured approach to innovation

Leadership & Planning
Creating and executing a strategic approach to innovation

Context
Aligning innovation to deliver against the business vision and objectives

ORGANISATIONAL CONTEXT
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Innovation Management System

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Organisations traditionally make use of lagging metrics to measure progress using metrics such as number of sales, return on investment, or time to market.

These metrics are fine for established systems and processes that demonstrate short term returns and are relatively easy to track as they measure things that have been achieved.

Lagging metrics have a part to play in measuring innovation, but often show innovation activities in a poor light as the implementation of new ideas tends not to achieve rapid return on investment. Building new products and services and achieving market share takes time.

The alternative approach is to use *leading metrics* that capture the results and impact of actions and experiments that fall within an overall process. Examples of leading metrics could include levels of innovation activity, participation, and training delivered. (See Box for more detail)

Leading metrics provide rapid and dynamic feedback on the activities undertaken and can therefore inform decisions long before a product or service gets to market. The chosen metrics should be specific to the organisation and its innovation strategy and should balance leading and lagging metrics.

Examples of useful innovation metrics
Lagging Metrics
- percentage of revenue coming from new products or services introduced in the last x years
- number of new markets entered
- number of new products or services launched
- level of grant support achieved for new product development

Leading metrics
- percentage of staff that have completed innovation training
- number of ideation campaigns run
- percentage of staff actively participating in the campaigns
- number of involved customers engaged in the innovation programme number of new ideas generated

Demonstrating innovation commitment and excellence via ISO standards

When an organisation secures ISO standard certification, it sends a strong message to its staff, Board, partners and customers that is taking the activity seriously.

As discussed, ISO56002 is guidance. It does not mandate how an organisation should innovate, but instead provides best practice guidance on what an organisation needs to consider if undertaking an innovation programme. The forthcoming ISO56001 will build upon the guidance outlined in ISO56002 and will be the basis for a fully certifiable standard for Innovation Management Systems.

For those new to innovation or to international standards, it will outline the appropriate controls, measures, and processes that an organisation should have in place to manage innovation effectively.

Deploying a quality IMS enables a business to develop a vision, strategic themes, key objectives and supporting action plans

Where an organisation has already achieved ISO standards, for example for quality, environmental or information security management, then it will be possible to take the innovation standard and thread it into its broader ISO framework as an addendum.

Unsurprisingly — from an organisation that focusses on management systems — ISO 9001 covers quality; ISO 14001 addresses environmental concerns; ISO27001 looks at Information Security — ISO has now defined 'what good looks like' for Innovation in terms of a management system.

ISO56002 does not promote or suggest a 'tick list' approach against a set of procedures — the focus is firmly on non-prescriptive best practice. ISO56002:2019 does not mandate how innovation should be delivered, but instead outlines the aspects that should be considered when delivering it.

The key components of the ISO standard are as follows
- Leadership and Planning [Strategy]
- Operations [Delivery]
- Support [Capability]
- Measurement & Improvement [Excellence]
- Context [Organisational Context]

International standards for innovation

European Foundation for Quality Management (EFQM) launched its Innovation Excellence Model towards the end of 2018. The model draws on best practice from over 30 countries and focuses on the competencies, processes and capability required to deliver innovation across the areas of direction, delivery, results, and climate.

In July 2019 when the International Organisation for Standardisation (ISO) launched ISO56002:2019 Innovation Management System Guidance. This guidance came from the consolidated views of by innovation specialists, standards experts, and academia from 43 countries and provides a clear definition of a viable system for innovation management and delivery.

Organisations that embrace ISO56002:2019 benefit as follows:
- evidence that innovation is being treated seriously in the business
- differentiates business from peers and competitors
- innovation credentials in tender responses
- proof that innovation is being well-managed

Despite best intentions and significant investment of time and money, innovation can remain a frustrating pursuit. It will continue to be difficult for as long as organisations approach it in a tactical, ad-hoc manner.

The key to successful, long term innovation is to combine creativity with best practice and tools that allow us to embrace the unknown, harness creative energy and convert that into innovative thinking which, in turn, will realise significant value into the organisation.

Discover more about systemic approaches to innovation
If you want to implement a systemic approach to innovation within your own organisation, please contact me to find out how.
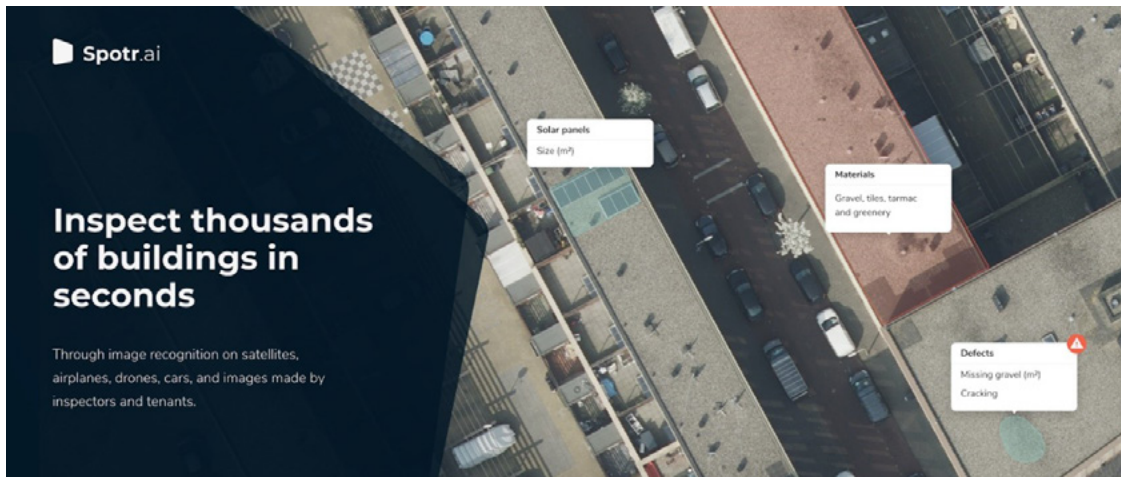
Send me a message on LinkedIn: https://www.linkedin.com/in/charlietuxworth/ ▸

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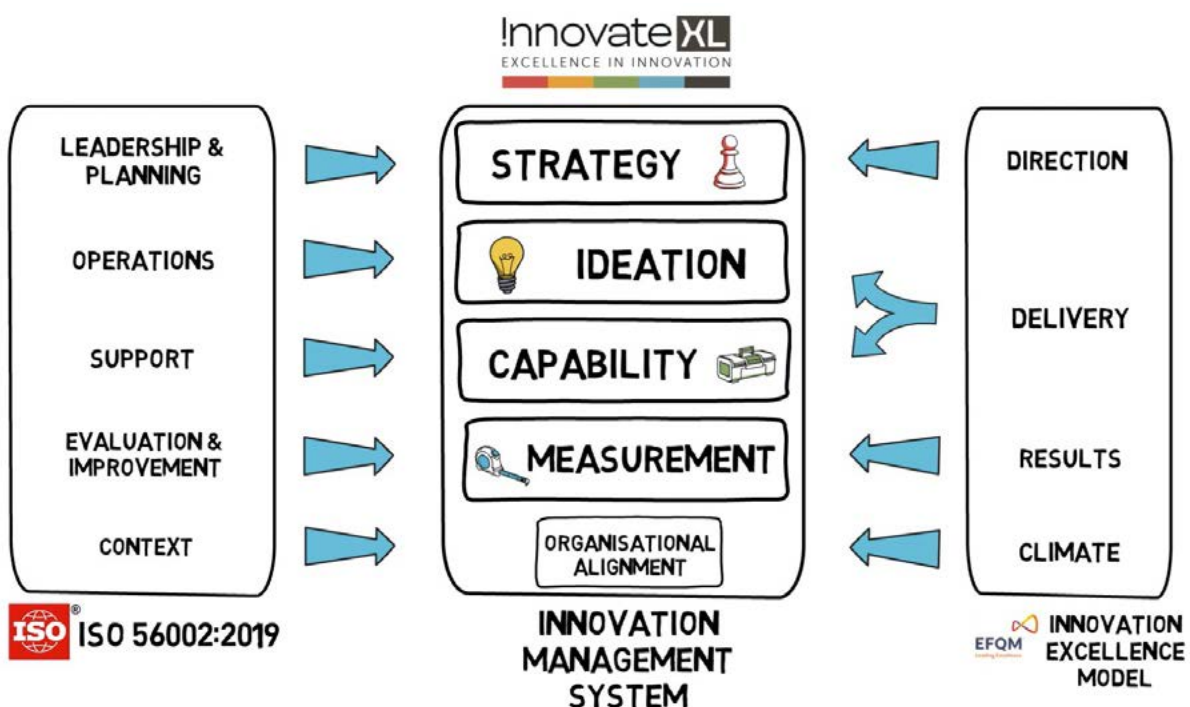
INSPECT

EVERY BUILDING WITHOUT LEAVING YOUR DESK

Under the bonnet with Spotr.ai

Asset management is facing its biggest challenge ever. More data needs to be gathered and more work needs to be done with fewer people at lower cost and in less time. The key drivers are the Paris Agreement on tackling climate change and, especially in the UK, increased focus on managing fire safety.

In Holland, a young company called Spotr.ai has developed a ground-breaking platform which can survey buildings in minutes by deploying a combination of aerial and close-range photography, geo mapping and artificial intelligence.

DIN met Spotr.ai to go 'under the bonnet' and find out how their combination of human ingenuity and technology works in 'real time'.

History of Spotr.ai
*Dirk Huibers
CEO and Co-founder*

I am one of the founders of Spotr.ai. I graduated in Building Science but, due to the 2008/9 economic crisis, there was no work in real estate in Holland. I retrained as an IT professional and developed software products for a consultancy firm. There I met Spotr.ai co-founders, Tara and Marieke, who had also studied Building Science.

At this firm, we developed a prototype for software to help building owners assess the energy efficiency of their buildings. Our employer was reluctant to invest in developing the system. So, the three of us left and set up Octo (now Spotr.ai) to develop the system ourselves. We secured a few sales but not enough to live on. We were forced into part-time work for others as software developers whilst we continued to grow our business.

Just when we needed a boost, we were accepted for the Google Launchpad programme. That taught us to be more problem oriented and helped us to focus on solving urgent and scalable problems.

As the market for our energy efficiency system was limited, we needed to pivot the business. What problems could we solve by using a combination of images, AI and geo-mapping? We asked every housing provider on our mailing list to specify their top ten problems and promised to see whether this combination of technology could solve them.

The first client to respond was a Dutch housing association. It wanted an assessment of the extent of window frame wood rot. Initially, we thought this could be achieved using sensors to detect moisture. However, the technical problems were insuperable. Instead of being disappointed, our client saw a huge opportunity! They asked us if in addition to detecting the size, number and proximity of window frames, we could also detect any cladding (by square metre), type of roof, how large the garden and so on. Because getting that straight for their whole portfolio would make an immense impact.

We intended to use drones to take aerial images which could detect cracks in window frames and gaps between frames and lintels. However, it took months to secure the licences to fly. That is why, in the beginning, we were deploying a telescope on a seven-metre-high selfie stick. We mimicked drone photography and demonstrated that the combination of external photography with artificial intelligence added new layers of data for analysis.

We became the test case for the regulation of commercial use of drones in the Netherlands. After 18 exhausting months of technical discussion, the Dutch government eventually introduced regulations — which were then adopted by the EU and (barring any future Brexit opt-out) apply to the UK today.

We tend to rely mostly on aeroplane images because they are already widely available in every city in the UK including London. We only use drones for specific purposes as they are more expensive to operate. Soon we will be using images taken from Airbus zeppelins.

We have discovered that photographs from the zeppelin and commercial aeroplanes provide similar data quality for measurements to drones and still enable us to deliver the most important results.

We have now analysed about 250,000 homes, in the Netherlands, Germany and in the UK. Our team comprises around 25 full time employees plus about 40 students who work part-time on labelling the data used to train our models.

Our IP is in our data sets. We have huge data sets with labelled images, which are not easily replicable, which we use to train our algorithms.

In a 2020 pilot we provided data for Places for People on solar panels, building height and cladding — covering 80,000 homes — in a few minutes

We undertook a UK pilot in 2020 with Places for People. The client asked us to focus our analysis on three aspects:
- solar panel detection on roofs. Does the property already have a solar panel? If not, does the roof construction enable the addition of a solar panel?
- the number of buildings over six storeys in height that could accommodate the construction of an additional floor whilst still being compliant fire regulations
- the amount of cladding on all buildings over six storeys in height

Analysis of these issues, covering 80,000 homes, was undertaken in minutes and saved lots of site visits by inspectors or external surveyors.
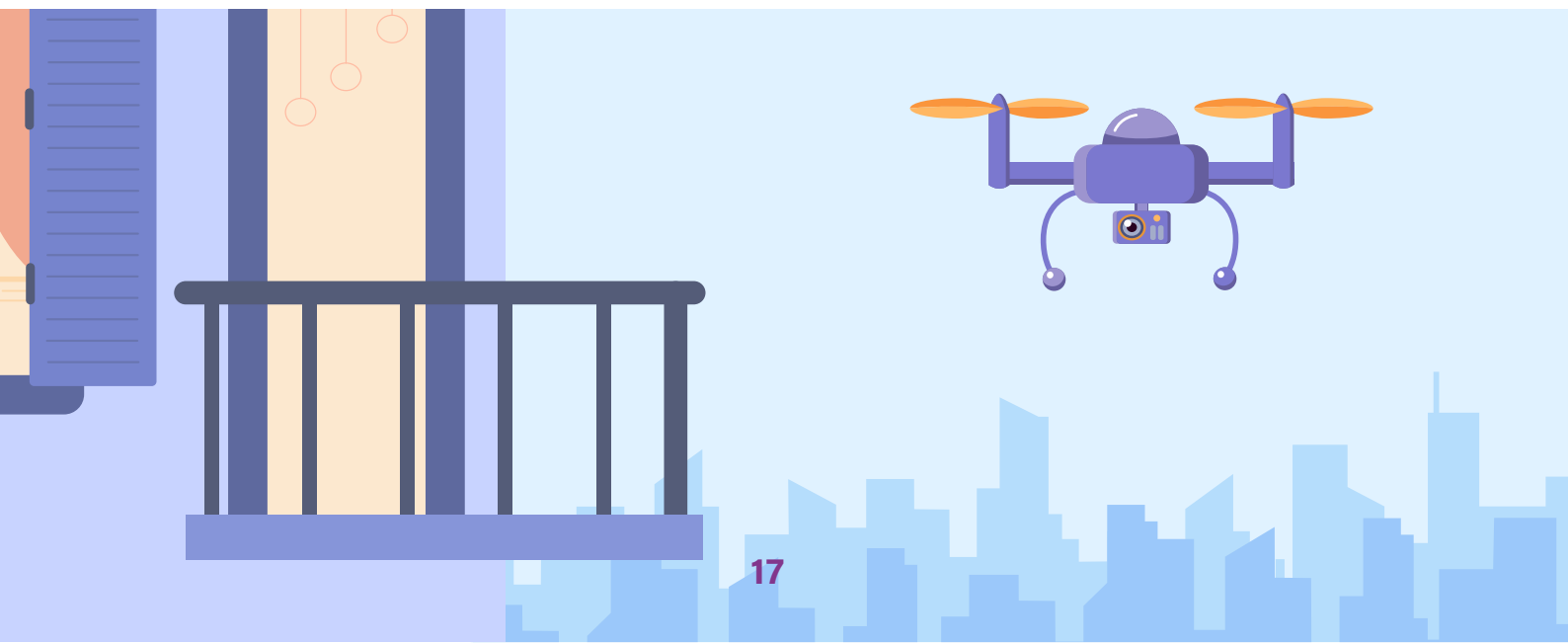
The Spotr Platform
Marieke Dijksma
CTO & Co-founder

The first thing users of Spotr see and use is our platform. It is designed to enable users to access data and images at several different levels, to inform their asset management business decisions

Mobile version of Spotr platform

We sell information — but in a visually pleasing format. We are frequently asked by clients if they can access data in Excel. But Excel is not visual. So, in our platform we add this extra visual layer. The platform is a way to access the data, to filter it and to interact with it. The back end has been developed in the AWS cloud and the front end in a low code application called Mendix. All images are stored by us. Then we run our AI image recognition tools over each image.

The results of the image analysis are then stored in an AWS RDS database. We are working on an approach whereby the user can automatically receive the analysis tagged to each image. The final outputs are then transferred to the client systems using an API.

This is what users see when they log in — a map with all their property on it. The user can then zoom in to see neighbourhoods or individual buildings in more detail. Then they can click on an image repository, containing all the images that we have been able to source for a particular building.

The user can then click to see a bigger view — including tags that represent filters such as window, road surface and tree — where they can interrogate metadata about it about the image. As part of this 'front end', we have an elastic search engine which enables the user to easily search and query our database.

When we supply our data to the client, normally in an Excel format, we also create a BIM model in a format compliant with international BIM modelling standards.
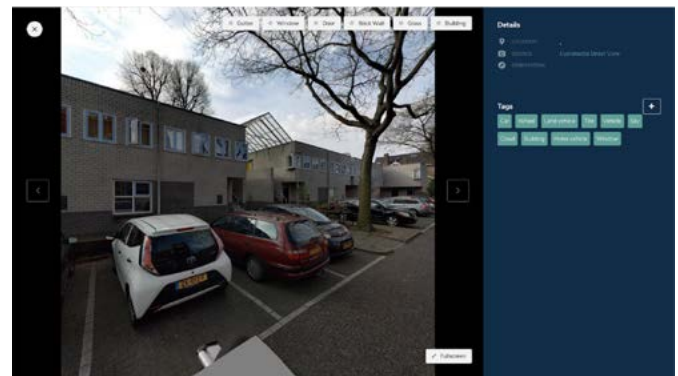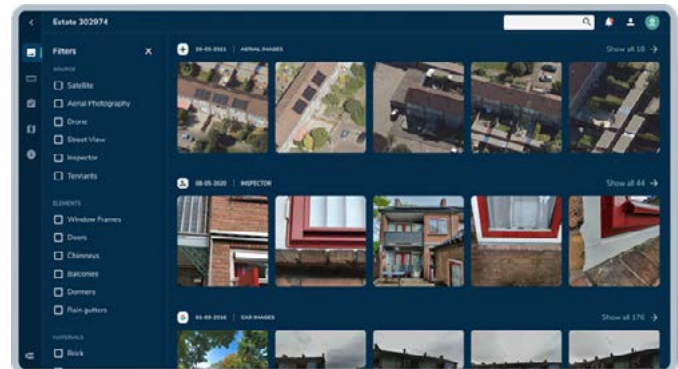
How Spotr Works *Dirk Huibers*

Spotr is designed to inspect buildings from a distance and provide most of the information provided by a stock condition survey. Spotr also provides additional data unavailable through traditional surveys. Whereas traditional surveys inspect only around 6% to 8% of a landlord's stock, Spotr inspects 100% of a provider's portfolio.

Spotr deploys three principal technologies:
- geomapping — every country has its own coordinate system
- data collection
- AI image recognition

Our approach provides detailed data on each home, quickly and at a fraction of the normal cost of conducting an on-site surveying. We provide complete transparency regarding the source data for our measurements. Our measurements are 95% accurate — equal to the accuracy of manual surveying.

Data collection
Initially, all we require from the housing provider is an Excel sheet with basic details of its properties — basically postal codes and the top line of the address or a UPRN number. The client can also help us by providing any existing images it holds, particularly for interiors.

We create a unique link for every dwelling
All housing providers can provide data at building level. Some can provide data at façade or window level. If we know how the client's data is structured, we can map our data transfer to align with the existing data structure.

Spotr then deploys three core sources of data — Land Registry, LIDAR and property images.

Land registry data
If we can access the postcode of a property, we can then obtain from the Land Registry details such as plot sizes, building outlines and so on.

LIDAR data
LIDAR is an airborne mapping technique which enables measurement of the height of a building, the terrain and surface objects on the ground, using a scanning laser that measures the distance between the aircraft and the ground.

We can determine the height of each building by accessing publicly available LIDAR data and/or purchasing it from respective governments. In the UK, the Environment Agency National LIDAR Programme has been collecting elevation data at 1m spatial resolution for all buildings in England since 2016 and expects to complete its work by the end of 2021. Surveys are published through the DEFRA Data Services Portal.
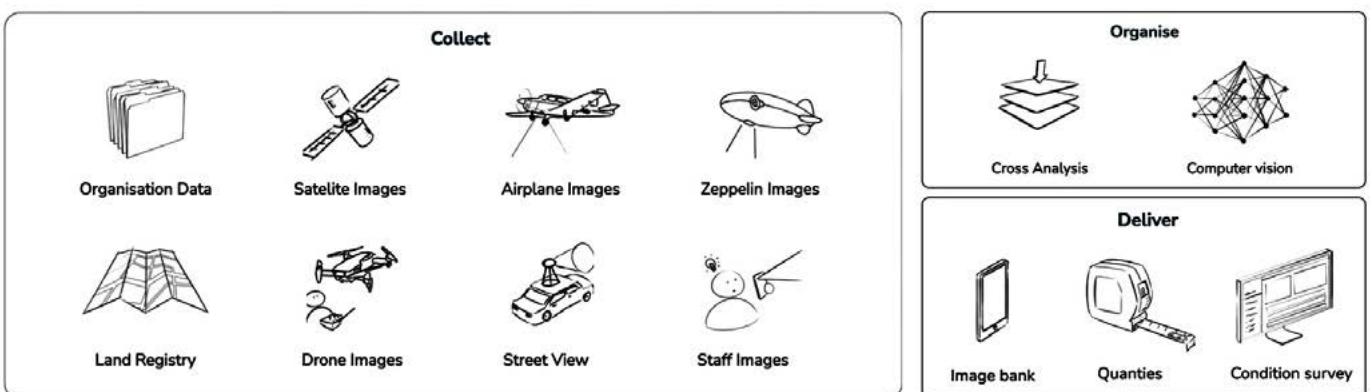
LIDAR delivers data in three-point clouds, describing the surface of an object, a building, or a whole area in 3d points, like 3d coordinates. We manipulate these to capture the height and geometric surface of any object or building to almost perfect accuracy.

Property images
We can access any image ever taken of a building. The more data sources we layer on top of each other, the greater degree of accuracy.

Our image bank sources include:
- satellite images —updated daily
- Google Street View — updated every two or three years in in the UK and every year in Holland
- Cyclomedia, which provides a similar service to Street view (and is planning to enter the UK market) but with higher quality images — updated every year in Holland
- aeroplane images — updated daily across Europe
- drones — updated periodically when drone sent up
- photographs provided by residents, surveyors, maintenance staff and so on

Collect: Organisation Data, Satelite Images, Airplane Images, Zeppelin Images, Land Registry, Drone Images, Street View, Staff Images

Organise: Cross Analysis, Computer vision

Deliver: Image bank, Quanties, Condition survey

Artificial Intelligence and data analysis
Gina Stavropoulou, Data Scientist

Having collected a significant amount of information for each building, the data is used as input for Spotr's deep learning algorithms which are trained to identify the building characteristics. The models developed by Spotr are tailored to detect the building's exterior features and the focus is on three main tasks:

- object detection, like solar panels, windows, rain pipes, chimneys etc.
- materials recognition used both for facades and roofs in a building or its surrounding environment — such as gravel, greenery and different types of masonry, tiles
- defects detection, such as cracks in lintels or missing roof tiles

We do so by training our system to recognise every instance of a building element automatically. This means showing it upwards of 5,000 different labelled images per building element. The data interpretation involved in this process also involves the application of our founders' architectural knowledge. We tend to have a specific model for each individual building element or component. This involves a lot of work. We employ around 40 students to label the data used to train our algorithms.

Based on the output of the deep learning models and in combination with the rest of the available data, Spotr can calculate that the surface area of a building is 5,000 square metres, its structural volume is 17,500 cubic meters, its height is 20.8 metres and the window to facade ratio is 44%. Spotr can also calculate the size of window frames and doors and answer questions about the quality of various elements, their orientation and their material.

We are currently working on further enhancements to the data that Spotr can provide:

- using thermal image data to deliver more information on the energy consumption of buildings
- distinguishing between different types of cladding material
- detecting which materials are used in building components, for example whether a window frame is made from wood, metal or PVC
- developing the capability to estimate how many floors a building might have, which belong to which floor and where they might be located

Tackling internal stock condition *Dirk Huibers*

Spotr captures information on the internal parts of a building in several ways.

The first approach is to capture as much photographic data as we can. We supply the housing provider with a unique link for every property. Using this link, images can be captured and added to the property record by residents, surveyors, maintenance contractors and housing officers.

Housing providers can ask residents to upload images of all or part of their home — either during the stock condition survey exercise or at the point that repairs are requested. Photos can be uploaded using WhatsApp or email, using a time-limited link, or via an API interface with their landlord's CRM.

We are processing insights from an MIT study on predicting interior constellations.

In terms of surveyors or contractors, we have asked that when smoke alarms are being checked that a photo of the electrical installation is also taken. As a result, we can automatically detect, for example, the current and likely future performance of circuit breakers in the dwelling.

The second approach, that we are currently working on, is to use Artificial Intelligence to estimate the internal characteristics of a dwelling — to a high degree of accuracy.

By calculating the scale of the plot and the height of a building and combining this with data on building archetypes, we can predict the dimensions of its rooms, the size of window frames and doors, location of services and so on.

We do so by combining AI with digital twin technology and neural network learning from universities. For example, we are currently processing insights derived from an MIT study on predicting interior constellations. We hope to refine our model and further field-test it over the next twelve months.

How housing providers can use Spotr data *Dirk Huibers*

Delivery of results
Spotr does all the repetitive analysis, enabling the client to focus on creative analysis of the data. This plays to the strengths of the client and recognises the limitations of computing capability in terms of local data interpretation.

We can transfer our data to client systems in any format
However, most clients prefer to receive our data via an Excel spreadsheet. This enables quick alignment of Spotr data with existing historic property.

Spotr captures data on 100% of a housing provider's stock, meaning that the insights gained are more likely to be accurate than in a traditional survey

Client uses surveyors to assess the data and make recommendations
In terms of the scope of our service, we stop at the point which forces the client to engage with the model by interpreting the data. We took this decision based on our understanding of behavioural psychology. The final layer of analysis needs to be undertaken by the client.

Increased accuracy of stock condition predicted maintenance spending
Maintenance is increasingly being understood as a key element of the risk profile of a housing provider. Stock condition surveys are normally based on a sample of 6% to 8% of a property portfolio. Spotr captures data on 100% of a housing provider's stock, meaning that the insights gained are more likely to be accurate than in a traditional survey.

Fast BIM model data retrofit
Populating a BIM model, particularly if one was not created at design stage and subsequently updated to capture actual planned or responsive maintenance, is an arduous task.

However, by using Spotr platform the client can populate 90% of any BIM model in about 10 minutes. Where the client already has a BIM model, we can drop our data directly into it. We are currently refining this process to provide data at BIM Level of Detail 3 (LOD3).

Testing the accuracy of existing data
The housing provider client can triangulate the data we supply with its existing asset management data to check upon the accuracy of the latter. It is likely that our data will be more accurate and detailed than the information that the client already holds. Where we spot material discrepancies in the existing data sets, we inform the landlord but do not change or override their data.

By focusing on data discrepancies which arise, the client can 'start afresh' by undertaking a more forensic process of data cleansing than it could have hitherto.

Increased accuracy of repairs orders
The client can use our image bank and data when handling incoming requests for maintenance. When a tenant rings up a contact centre, for example, the call handler can immediately access images of the property. The call handler is thus in a better position to understand the nature of the repair request or to interrogate the resident until the required information is communicated.
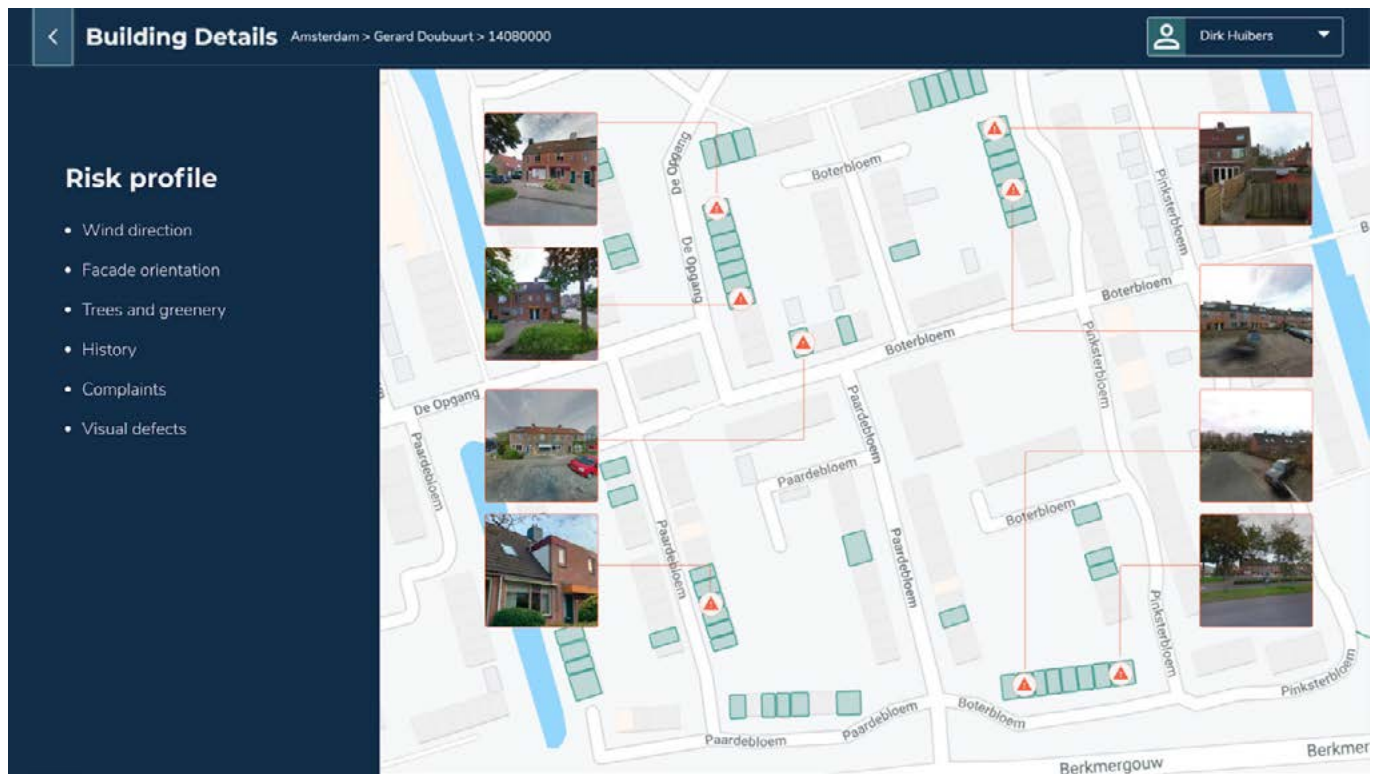
Spotr creates a risk profile for every dwelling

In this example, we log current and historical data on wind direction, façade angle, trees and greenery around a plot. We can then predict which properties have a greater likelihood of future problems.

Increased accuracy of predicted spending on meeting energy emission targets

Energy efficiency is increasingly being understood as a key element of the risk profile of a housing provider. Housing providers are now being required to supply a lot of data on energy efficiency that they may not currently hold. They can conduct additional stock condition surveys, but this takes time and is expensive. Spotr can supply a high proportion of the missing data within days at a relatively low cost to the client by bespoke data capturing services. These include sending a plane, car or surveyor out into the field to capture the needed data.

Fast assembly of data required for regulatory compliance

Housing providers are now being required to supply a lot of data on fire safety that they may not currently hold. We can supply data about building height, fire escapes, types of cladding, types of balconies, stacking of balconies and facade areas.

Reduced spend on physical stock condition surveys

It is simply much more efficient to get that data from the air than from the ground. We do not suggest that clients who use Spotr can eliminate the need for any on-site stock condition survey work altogether. There are always things that you cannot detect from imagery alone — such as wood rot. But on-site inspection can be a pre-scan to focus human efforts in a more efficient and economical way.

We supply the imagery fast and in a safer way. For example, roof inspection no longer requires a surveyor to climb up on it.

Whilst this article provides an in-depth under the bonnet insight into what we do, this is only a fraction of the overall functionality that our service offers. To be taken step-by-step through your offer, we are happy to arrange an online live demonstration for you.

The Proptech Innovators Network has been running a DINLab over the summer of 2021 with members and Spotr to assess how their solution works in real life in the UK social housing market. The results of the lab will be published and shared in the autumn.
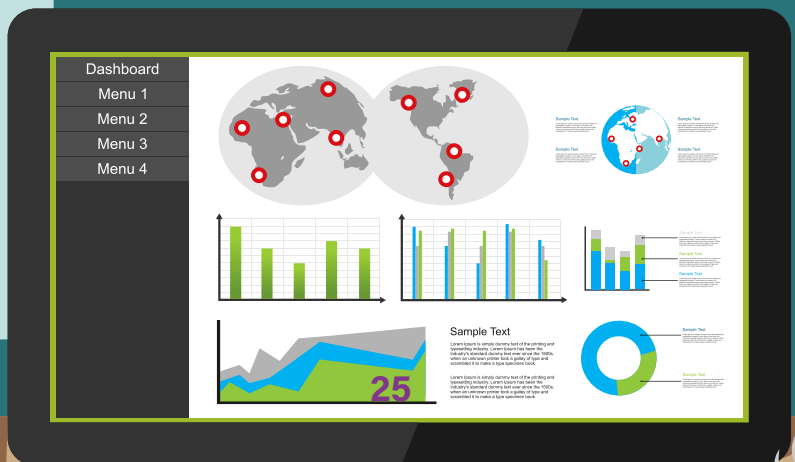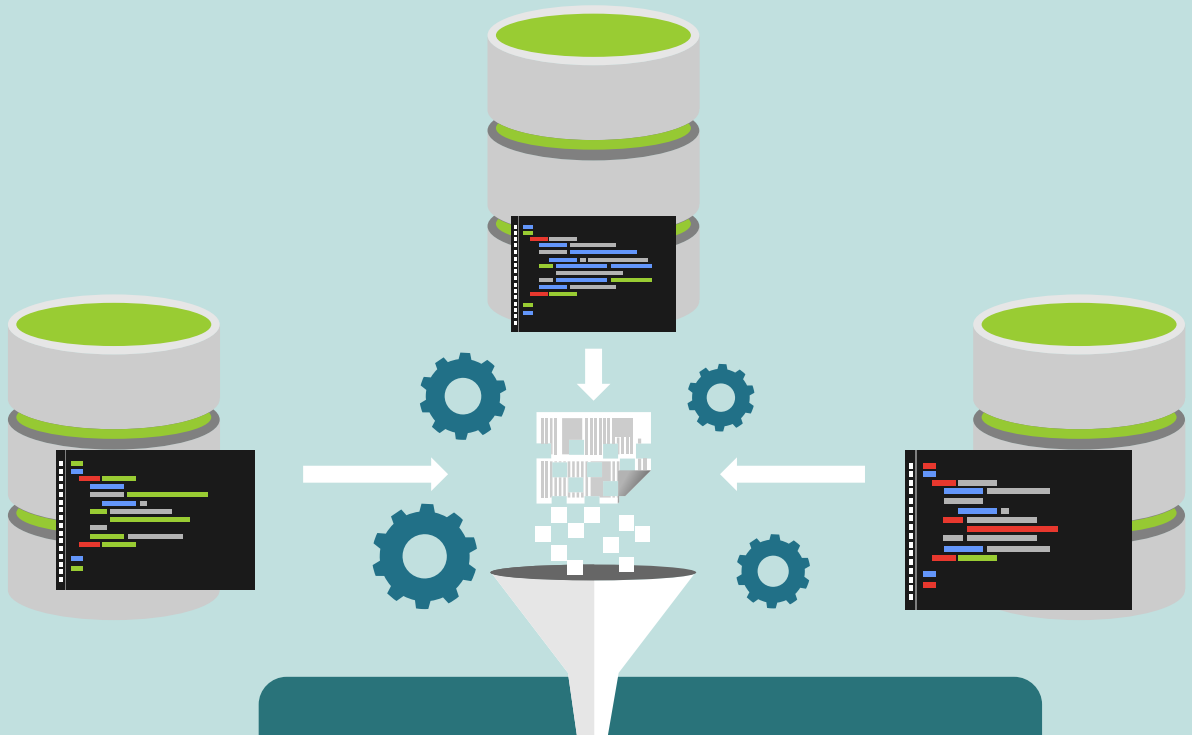
Contact

www.spotr.ai

For anyone interested in working with Spotr in the UK please contact Jenny Danson, Proptech Innovation Network Director jenny.danson@disruptiveinnovatorsnetwork.co.uk

The DIN Labs presentation ▶

DATA THAT WE CAN RELY ON

Under the bonnet with tech and data consultants 3C on helping housing providers to improve data quality

Project Management and Delivery

Claire Bayliss, Director, 3C Consultants

Every business wants to know that it can rely upon the data it uses to make decisions. Every business wants to manage data to ensure efficient operations. Every business wants to predict and manage risk effectively using data.

All of this depends on data quality. Poor quality data undermines data-driven decision-making. Instead, it leads to indecision, bad decisions and decisions made by the gut. Most organisations, including housing providers, do not know how good their data is. Increasingly, providers are calling in consultants to help them find out and to fix the data quality issues that emerge.

What happens 'under the bonnet' of this engagement from a consultant's perspective? How do they identify data quality issues and how do they fix them? How do they persuade the client to address the underlying causes of poor-quality data? DIN met Claire Bayliss and her team at 3C Consultants to find out.

Why do housing providers contact you about data quality?
They may have a crisis and need urgent help to fix it, though this is rare. They may be undertaking a programme of work but lack the skills or human resources required to complete it. Or they may be looking ahead and seeking to tackle underlying problems in service delivery and/or reviewing their overall data strategy.

Do clients know what they want, or do you have to help them work that out?
Some clients know what they want to do and are simply looking for independent advice on how to do it. Others may wish to digitise their services but lack the expertise and manpower to do so. They may not appreciate the level of groundwork needed, especially in relation to data. Often, they need to undertake a specific project involving restructuring or migrating data before they 'go digital.'

Our role is to provide technical advice and expertise, drawing upon our experience of what works and what does not, and to advise on data governance.

First, we need to understand the context. Is there a big transformation programme going on? What is the background to calling us in? Has the customer tried and failed with a data dependent project in the past? What are the issues from the customer perspective?

Is the data discovery phase the moment of truth for clients?
Particularly with new clients, our work on data discovery and assurance can be a defining moment in the engagement. When we ask business teams about the quality of their data, they rarely know if it is good or not. So, we start the discovery process to find out. My colleague Nathan Beardsworth will explain exactly how we do it. (See page 28).

Our initial focus is on asset management as that is the part of the business that can cause injury or even death. Naturally the first thing we look at is gas servicing. Typically, we will look for discrepancies between the number of properties with gas appliances in the housing and asset management system and on the gas servicing spreadsheet. And then the business usually tells us that it is the spreadsheet that is correct! James Holland will explain how we tackle asset management data. (See page 29).

Having looked at asset data, we then move to other high-risk areas in terms of legal or regulatory compliance — such as data protection. For example, we examine applications for employment and for, say, shared ownership. These are areas where a lot of personal data is gathered and is not always disposed of afterwards.

Increasingly, by deploying Data Logic, our data quality tool — as well as identifying data quality issues — we can help the business reduce its storage costs and contribute towards 'net zero' targets. In doing so, we make it easier for the client to find data by deleting historical or duplicated unstructured data, often held in Word or Zip files, emails and spreadsheets.

By the end of the data discovery phase, we will have helped the client identify what is needed to fix their data. But the client needs not only to clean the data but also to address the causes of its data problems — 'turning the dirty data tap off' — or else the quality of data will degrade again over time.

What are the root causes of poor-quality data?

We often find that a business assumes that the data belongs to the IT team, and it is their responsibility to sort it out. And, of course, the IT team cannot sort out the data because it is not their data. All the IT team is doing is storing that data and operating the systems required to manage it. Data quality is the responsibility of the respective business teams, where accountability for data quality rests.

We quite often to find that data has been collected without adequate procedures for data validation. We regularly encounter data collected in spreadsheets because staff do not trust the data stored in the core applications. This can make it difficult to access data and to manage its quality. The more logical solution to issues with core applications is to fix them through re-implementation or a new system procurement. It is up to them how they do it, but they cannot continue managing key business data via spreadsheets and expect to be compliant and 'go digital.'

One sector trend that is helping with data quality is that most clients are now moving to Microsoft 365 and gravitating around the use of Power BI (a part of the 365 package) — and to a lesser extent Tableau — for data analysis. This is far better than having different departments using plethora of data extraction and management tools to drag the data they need off the system.

However, our clients are often being held back by the difficulty in extracting data from legacy applications. If issues cannot be resolved, the client will need to consider migrating to another housing management or asset management system as continuing to rely on poor data poses a major risk to its business.

How do you frame your recommendations to the client?

We explain to businesses that they cannot undertake digital transformation and to 'go digital,' until the data is right, and they have an assurance framework in place to ensure that it remains so. This means that they need to fix their processes for collecting and verifying data across the whole business.

We normally produce a first draft of recommendations for the client, which would say what we really think about what needs to be done to address data quality.

We explain the benefits and risks of our recommendations and the cost and optimum timetable for implementation. We would outline the actions required by other parts of the business for our recommendations to work. We would conclude with 'next steps' in terms of sign-off and execution. We try and simplify what can appear a daunting task.

We then discuss the draft with the client and eliminate aspects where the client tells us that, sadly, such and such is not going to happen. So, by the time we present the final draft the recommendations have largely been agreed by the client's senior management team.

How important is 'trust' in persuading clients to accept your recommendations?

Gaining and retaining trust is vital if our recommendations are to be accepted. IT systems suppliers may suspect that we are recommending the wares of their competitors. Yes, we do sometimes need to explain to clients that their system provider is no longer investing in a product and/or that an application will no longer be supported, and they need to switch. Ironically, it is more common for clients to want us to tell them to dump a system and we end up telling them that the system is not the problem. On one occasion a client wanted us to help them ditch the core IT system and had made a budget of £2 million available. We told the client that they system was not the problem so do not invest that £2 million but, instead, spend £120,000 on training staff how to use the existing system more effectively. It never happened.

Heads of IT teams may suspect that we will recommend that they are no longer fit for purpose and need to be replaced. Sometimes we are brought in to do that, but it is more common for us to make the case for greater investment in training and support. We often point out to senior management that they are only hearing the 'bad things' about a service and not the 90% of things that are going well.

Clients may be reluctant to invest in data quality — the executive and/or the board see IT expenditure as a cost rather than investment. There have been several instances where I have had to tell the Chief Executive that if they do not spend money urgently, then key services will stop operating within days or weeks.

Clients may also think that our investment recommendations are influenced by links to specific suppliers, which is not the case. Recently, we had an instance where an executive team agreed that a key IT system had to be replaced but their board rejected it because they refused to accept an investment recommendation from a single adviser. Fortunately, around 90% of our work is repeat business. These clients see us as honest brokers capable of making objective recommendations that have proved successful in the past.

Surprisingly, to some at least, little of our repeat business is an immediate follow-on from an existing engagement. Often, we do not hear from the client for a year or two and then 'out of the blue' they call us up. Trust comes from the client not feeling that we are not trying to leverage extra work from an assignment.

The first thing we do is understand what data is important to the client and how they plan to use that data. This provides the context for our work.

Next, we work with the client on cleaning up the data that the organisation holds. Our immediate objective is to help the client identify and rectify data gathering processes that introduce poor quality data. We call this the 'dirty data tap' and the trick is to turn it off.

Our digital data quality application (Data Logic) plays a key role here, as it is designed to manage unstructured as well as structured data. Structured data is information that sits in core system databases. Unstructured data is everything else such as information within spreadsheets, shared drives, emails. Data Logic operates on a 'plug and play' basis, capable of interfacing with any data storage software and with Microsoft Excel.

Deploying Our Data Quality Application To Improve Data Quality
Nathan Beardsworth, 3C Consultants

A 'rule' is created in Data Logic — for example how phone numbers are to be collected — which is then hard-codified in the form of a 'registry expression.' If a phone number is later entered in an invalid format which does not conform to the 'registry expression,' our app will flag up an error message at the point of data entry.

This alert may simply encourage the data owner/inputter to follow the correct format. Alternatively, it may lead to a workshop, which we facilitate, to investigate the roots of data inaccuracy. Those roots might lie, for example, in bulk data transfers following merger with another organisation. We unpick the root problem and advise the client on the remedy.

That process, applied across all the client's data fields, then becomes part of a broader review of the client's data. Many organisations do not know how good their data is, which leads them to doubt the results of any analysis of that data.

Where customer client databases lack the necessary integrations between data fields, we can create the data merges or joins within Data Logic. We can also easily identify key data fields which are underpopulated or are absent and need to be created.

We connect Data Logic to the client's database, which allows us to create a structured index of all data fields held by the company (such as contact data, property data and so on) and the specific data collection rules. This index is then connected to a new data warehouse developed with the client and hosted onsite.

We then use Data Logic to create an SQL query, point the software at the appropriate data field, and (using a drag and drop interface) automatically extract the data required for analysis. Data Logic can present the data in several formats, including pivot tables, but clients benefit more by transferring the data to Power BI and undertaking analysis using the Microsoft data visualisation tool.

Data Logic is incredibly time-efficient, saving a huge amount of 'grunt work' in the pursuit of quality data. In fact, most of our time is spent working with the client to determine what it wants from the data and creating the SQL queries.

That is my favourite thing about the app — as soon as you know what the client wants and you have created the SQL query, you 'press the button' and in an instant the data appears. The time it can save and the assurance it can provide is incredible.

Disruptive Innovators Network

Deploying our Asset Component Structure Model to improve the asset management data quality *James Holland, 3C Consultants*

The Asset Component Structure Model is not an application, as such. In practice, it is my knowledge and experience put into an Excel model to drive discussion with an organisation around the collection of stock condition data.

I started my career as a qualified plumber and moved into housing association asset management in the mid-1990s. A real career change and that was when I developed the model. I have been refining it for the last 25 years! My job is now based on repairing dirty data taps rather than the water variety.

Historically, organisations collect stock condition data on a sample of their properties. It is primarily held by most organisations in a big Excel spreadsheet and gets loaded into the housing management and the asset management systems. And then it just sits there and goes stale.

Then organisations have the problem that their business information needs — for example, a financial forecast of the timing and cost of bathroom replacement — cannot be supported by the data they hold. The data required is highly detailed and it can be hard to determine accurate replacement costs.

I then present my model of what everything should look like. In doing so, my aim is to assist the client in visualising what data it will need to collect in future, the level of detail required and how to incorporate relevant data from other databases. Unlike the 3C Data Logic application, which searches for data across multiple databases, my tool primarily documents the asset data held within spreadsheets, the asset management system and the housing management system. *And then the client loves to pick holes in my model.*

In doing so, the client is energised and develops a clear understanding of what data is required, how that data is going to be used and the importance of data quality. These key building blocks need to be in place before the client can begin its data analysis and financial forecasting.

Changes in regulation — notably in respect of fire safety and energy efficiency — will also determine new data collection requirements. By determining the purpose of the data collection, the client is then able to determine the precise data framework that the business requires.

One of the benefits of my model is that it helps organisations identify and collate the property data they already hold. The organisation can then narrow down the amount of data that needs to be gathered by inspection — thereby increasing the frequency and reducing the cost of physical property inspection.

I also use the model to encourage the client to adopt the discipline required to produce quality asset data. The client needs a good asset list identifying property location, clear definitions of asset types (such as a bedsit, a maisonette and a flat) and other key property characteristics, eliminating unnecessary data collection where possible. Further decisions are required around how data is uniformly coded and aligned between the big Excel spreadsheet and the asset and housing management systems.

In terms of financial forecasting, the client needs to decide what data should be held under the tab (for example) entitled Bathrooms. Will it collect installation and performance data on individual components, such as basins/lavatories/bath/tiling/floor coverings? Or will it group them all together and call that a 'standard bathroom'?

What clients really want to know is when a bathroom needs to be inspected — to identify whether it needs to be replaced and how much that is likely to cost. Most housing management or asset management systems can record this level of data.

The discussion with the client often centres on the optimum phasing of programmed bathroom replacement, given that replacing each component element individually as its life expires is not cost-effective. What we do is not rocket science. It is just focusing on one attribute at a time and ensuring that it is complete.

The issue for the client is keeping data up to date when you have 60 to 80 attributes, each with 10 questions. That, in turn, depends on the level and quality of ownership of data within the organisation. Who has the inclination to frequently review and interrogate the data?

Once this can be resolved, the insight required will be available which will often transform the effectiveness of operational systems and keep systems up to date, turning off the dirty data tap once and for all. ◾