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Housing
Technology
2022

02-03 March 2022
The Oxford Belfry

HOUSING
TECHNOLOGY™
2022 | CONFERENCE AND
EXECUTIVE FORUM

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Digital twins in housing

Real-time replicas, 3D modelling, golden threads,
tenant safety and asset management

Customer management

CRM & omni-channels, complaints & Dynamics 365,
inclusive design and next-generation CX

Finance management

Service charges, cloud-based financials, predicting
arrears and finance integration

Infrastructure

IoT cybersecurity, QR asset tagging, environmental
sensors, virtualisation and modular housing

Housing management

Data mining, document risk, machine-learning &
IoT analytics, performance management software
and housing in 2035...

General news

Speculative design, geospatial data, digitisation
and ICT governance

Editor's Notes

November 2021

The best made plans...

As we head towards the end of 2021, what will your New Year resolutions be regarding your IT and business strategies?

Perhaps Housing Technology can give you some suggestions; we compiled the list below as the focus for our 2022 conference and executive forum (**conference.housing-technology.com**). Each housing provider will naturally have its own ideas, but we hope our 'top ten' list will provide further food for thought.

- 1. Innovation & creativity** – Planting the seeds for growth and efficiency.
- 2. People in housing** – IT leadership, project management and recruitment.
- 3. Business resilience** – Maintaining 'business as usual', mobile working, regulatory compliance, risk management and IT budgeting.
- 4. Ongoing digital transformations** – Technology, processes, business and culture.
- 5. Platforms for growth** – Reviewing & rethinking your core business applications.
- 6. Housing 2042** – What will housing providers look like in 20 years' time?
- 7. Data management** – Straight-through processing, automation & machine learning and predictive analytics.
- 8. Tenant communications** – Self-service, omni-channels, self-diagnostics for repairs and customer service.
- 9. Intelligent infrastructure** – Cloud vs. on premise, IoT and smart homes, cyber security, enterprise integration and post-covid planning.
- 10. What's next...** Proptech, digital twins, BIM, paperless tenancies and 3D printing for new builds.

And of course, if you'd like to find out more about all or any of those ten core areas, come along to **Housing Technology 2022 (02-03 March, Oxfordshire)** to hear from your peers and share your experiences – **reserve your place today at conference.housing-technology.com**.

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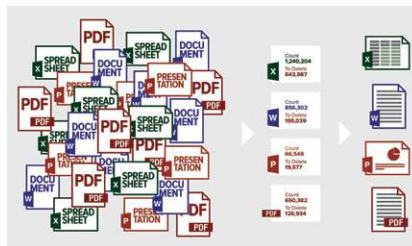
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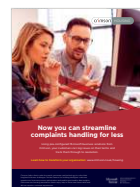
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Real-time replicas, 3D modelling, golden threads, tenant safety and asset management

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Mining your data resources, AI & automation



Chris Crane, Solutions Manager, Aareon

In the world of housing management solutions, the focus has always been on capturing data as a user progresses through a process. Historically, most systems were based on the concept of where a software developer thought it made sense to place the data fields, rather than how a logical path through a defined process could be created for the user.

Because of this rather unstructured approach, dissatisfaction in systems was a common theme with the staff who actually had to use the systems, and a legacy of poor-quality data was an inevitable result – something that has often only recently been brought into focus as organisations begin their shift to digitisation and then realise that data quality is a central part of that strategy.

Start with your customers...

Due to the obvious cost and resource advantages, the shift in thinking within the housing sector towards the cloud and browser-based systems has been vastly accelerated during the past few years when home working has become the default, accompanied by IT suppliers in our sector making this journey with varying degrees of urgency. But cloud and indeed software itself are the means to an end, not the end itself. I believe that what will really make the difference in terms of which future solutions will add the greatest value is the adoption of customer value as the starting point, seen in the context of the overall tenant journey.

The key components that will help in adding this value are intelligent automation, clear management information and a focus on processes as the starting point in our thinking.

Introducing automation in the tenant journey

Starting with the concept of intelligent automation, my experience is that the housing sector, like any other service sector, has traditionally done a great deal of repetitive, manual work. Almost every area of the tenant journey will prove this; for example housing providers' repairs processes have always been notoriously paper-heavy, with works orders, variations requests, completion

slips and invoices all requiring manual interventions. Or the arrears management process – with staff trawling through 100s of arrears' cases every week, sending swathes of expensive printed letters, yet not really understanding the effectiveness of this activity.

The necessity is to analyse where in each process we can add value by automation. Given that a housing management system doesn't exist in isolation, we see that a lot of the customer-facing work can now be picked up by self-service tools such as portals and apps.

These portals and apps have been augmented by virtual assistants which can deal with both message-based interactions but also voice activation, changing the game as far as customer interactions go. Capable also of integration with other channels such as social media, the virtual assistant becomes a powerful tool in the management of service provision. However, add to this the ability to learn and it increases efficiency even more.

For example, as questions are asked more frequently, the best answer can be 'learned' by the software using AI, and so customer enquiries that would once have tied up a customer service representative for five minutes can now be resolved without human intervention at the first stage.

AI for better tenant outcomes

There are myriad other scenarios where the deployment of intelligent automation can add huge value to an organisation. I've mentioned the arrears process; simply sending out letter after letter to a tenant because they happen to have an outstanding rent balance is the clerical equivalent of banging your head against the desk – repeating the same activity and expecting a different result.

What if the system could 'learn' as it goes along? If an arrears letter, email or text message is sent, and a payment or contact is made by the tenant within a defined timeframe, then we have a more positive result than if no response comes back from the tenant. If the software can begin to learn what the most effective intervention is for a particular tenant, when to send it, and what channel to use, then not only is effort reduced but there is a chance of a better outcome for the tenant as well.

Predictive maintenance to save time and money

Looking at the maintenance side of a housing provider's business, predicting asset failures is one of the holy grails of controlling costs while again minimising inconvenience to tenants. By flagging up the requirement for probable interventions based on known variables (an example of the massive value lying hidden and mostly unused in housing providers' existing databases), a system can enable more efficient planned spending on fixing the assets that are more likely to go wrong, rather than relying on tenants to report the repair when it breaks. Using predictive technologies in this area of the business is the modern equivalent of the adage 'a stitch in time saves nine'.

Data is king

The next area where housing systems have traditionally been weak is the provision of management information. Swathes of printed reports that were the staple of every housing manager 25 years ago, have developed into graphical reports, yet what they tell us is what has already happened. While that may be interesting or even useful, there's not much we can do about it.

The current vogue is for dashboards to provide more real-time information on performance, tailored to a specific role. Such visualisations can help us to notice trends or problems so that more can be done to correct the situation quickly.

The real value will be realised when AI is added to the mix; after all, almost all housing providers are sitting on vast, barely-tapped data resources, with potentially 20+ years of data in their housing and asset management systems. By applying modern analytical tools to this data, patterns can be revealed that can help organisations in planning and changing the way they do things. If you can begin to understand which factors will make a person's tenancy succeed or fail within the first three months of moving in, then you can focus your support on those areas and intervene much earlier when needed.

Improving the tenant journey

One of the key areas we are working on is to look at how systems can make the tenant journey as smooth as possible, by enabling housing providers to deliver an efficient service, to spot the bumps in the road ahead and to free up staff from manual tasks so they can be re-deployed in roles that add value to the tenants. I believe these can be achieved by introducing tools that let us all work in more efficient ways across all areas of customer service and end-user experience.

Chris Crane is a solutions manager at Aareon.



Wales & West Housing signs with Decision Time

Wales & West Housing has become the 15th Welsh housing provider to implement Decision Time's governance and performance management software. The company's other customers in Wales include Grwp Cynefin, Hafod Housing, Taff Housing and North Wales Housing.

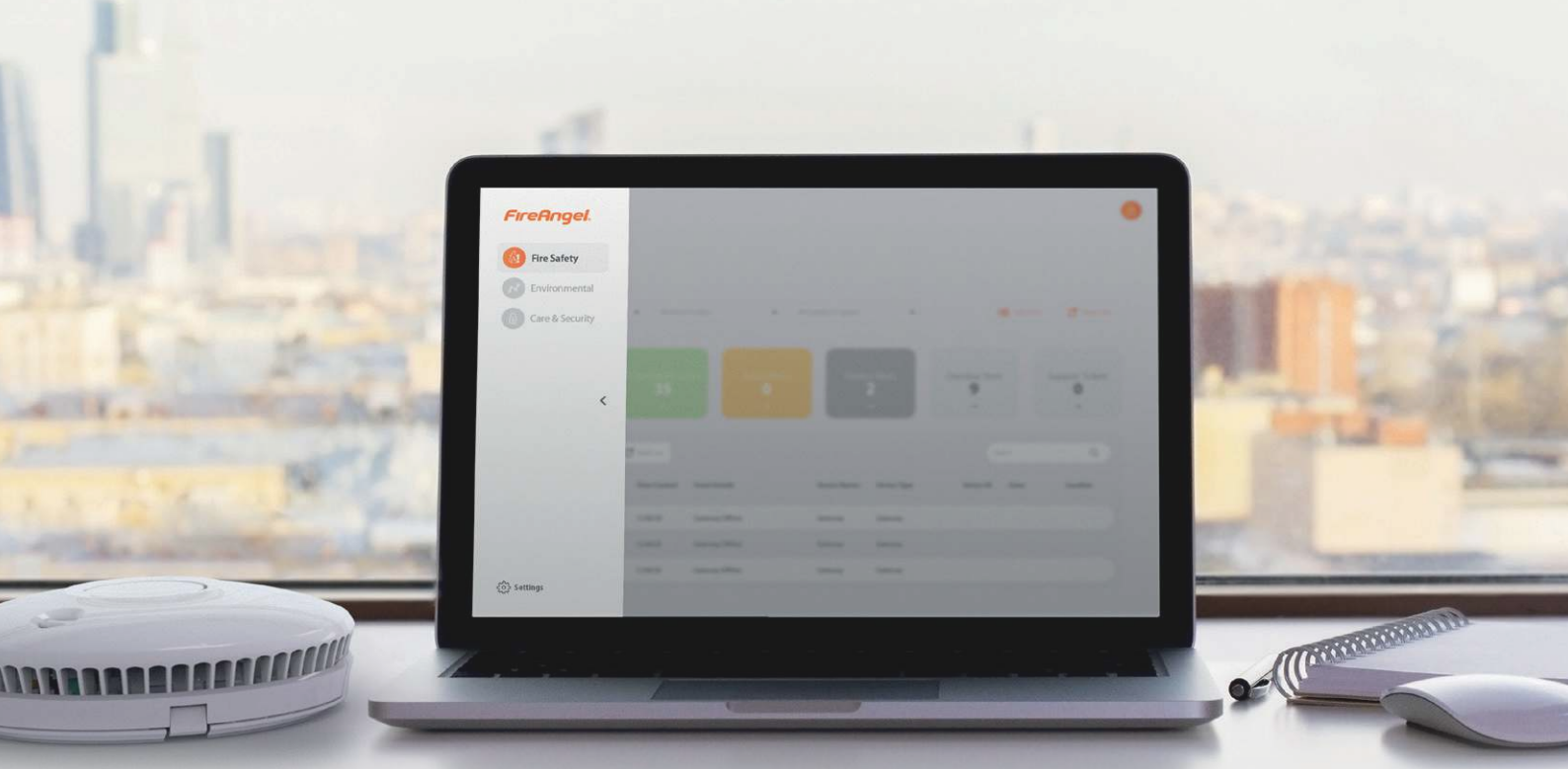
Decision Time makes it easier for housing providers to achieve strong governance by running effective meetings, managing risk and monitoring strategic performance based around a central information portal.

Claire McDougall, governance manager, Wales & West Housing, said, "It was important that our administrators and board attendees were all in favour of the new software. As part of the pilot project, Decision Time delivered training for both groups and the feedback was excellent."

Geoff Higgins, CEO, Decision Time, said, "Following a pilot project, Wales & West Housing has now chosen Decision Time as its portal software to manage its board and committee meetings. This means that Decision Time has now been implemented by 15 housing associations in Wales, demonstrating a strong commitment by the Welsh housing sector to streamline and consolidate their corporate governance requirements."

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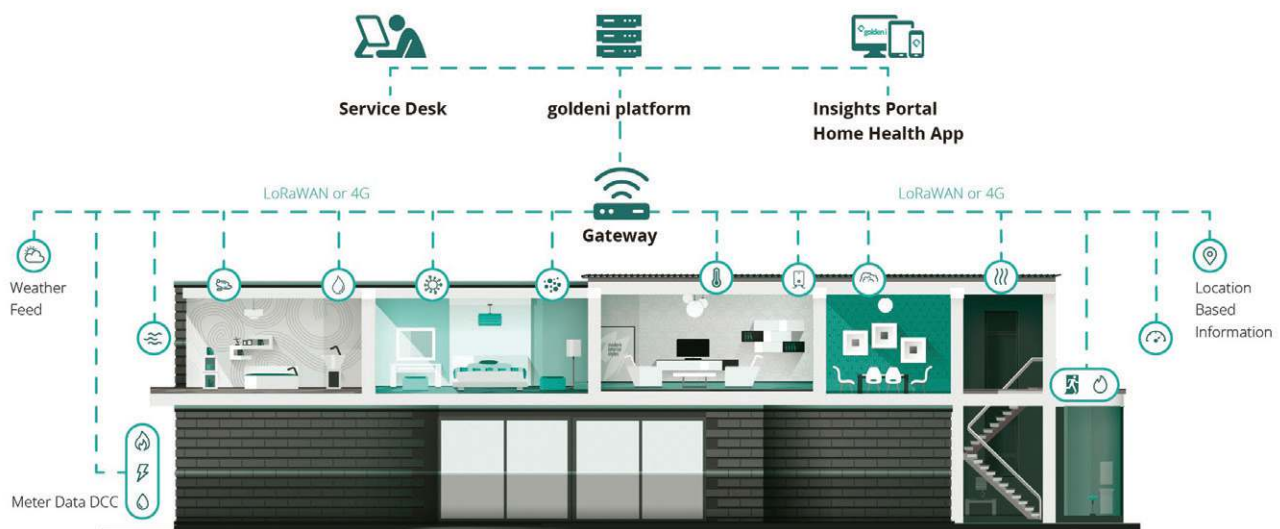
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- Air quality / particle pollution
- Location
- Atmospheric pressure
- Weather

Inside the home

- Temperature
- Humidity
- Smoke alarms
- CO₂
- Air quality (IAQ index)
- Ventilation / air flow

- Boiler/heat pump
- Gas meter
- Electricity meter
- Water meter
- Water leaks

Communal Areas

- Fire doors
- Fire escape
- Fire windows

Goldeni analytics launch from Morgan Sindall

Construction and regeneration group Morgan Sindall has launched IoT-based machine-learning software for the housing sector. The Goldeni platform generates real-time analytics for social housing providers to monitor their buildings' performance and ensure regulatory compliance.

Using IoT sensors throughout a property, Goldeni collects temperature, air pressure, light levels and carbon-dioxide data. The platform also monitors heating systems, detects for water leaks and monitors electricity and gas consumption.

Morgan Sindall Property Services is thought to be the first property maintenance provider to develop an in-house platform to consolidate and interpret data in real time from a number of commercially available IoT sensors.

Phil Copperwheat, information systems director, Morgan Sindall Property Services, said, "This is the first time we've launched our own bespoke, comprehensive software platform, developed entirely in-house. By using machine learning, Goldeni constantly updates and improves itself, so the more customers use Goldeni, the more useful and insightful it becomes."



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Documents – Are they an unmanaged risk?

Stephen Burnett, Senior Data Consultant, Intozetta

While the drive to an all-digital future continues, physical documents are still a fundamental part of most (if not all) housing providers' processes. How can housing providers ensure that they apply the same rigour to documents as they apply to databases and other electronic storage media, and really leverage the information they contain to enhance the customer experience?

Whether it's application forms, surveys, certificates or the seemingly unavoidable creation of spreadsheet after spreadsheet, businesses still rely on documents. Colleagues and customers constantly exchange documents and data, with often unknown quantities stored on a maze of drives that are rarely subject to the same rigorous protocols applied to 'production' systems.

Document storage is usually the responsibility of the user who has the ability to move documents between different internal drives and even external devices. Documents are downloaded, duplicated and reshared across numerous shared drives, mailboxes and platforms such as SharePoint, with little thought to the risks and costs involved.

Acknowledging the risks

The disparity between the control applied to structured data in databases and documents stored on drives is concerning when considered in the context of GDPR and

other regulations, financial risk, and the risk to business process. For example, while we can mandate archiving routines within our own systems to ensure compliance, documents can often persist on home drives, thereby breaching retention policies without a plan for retiring.

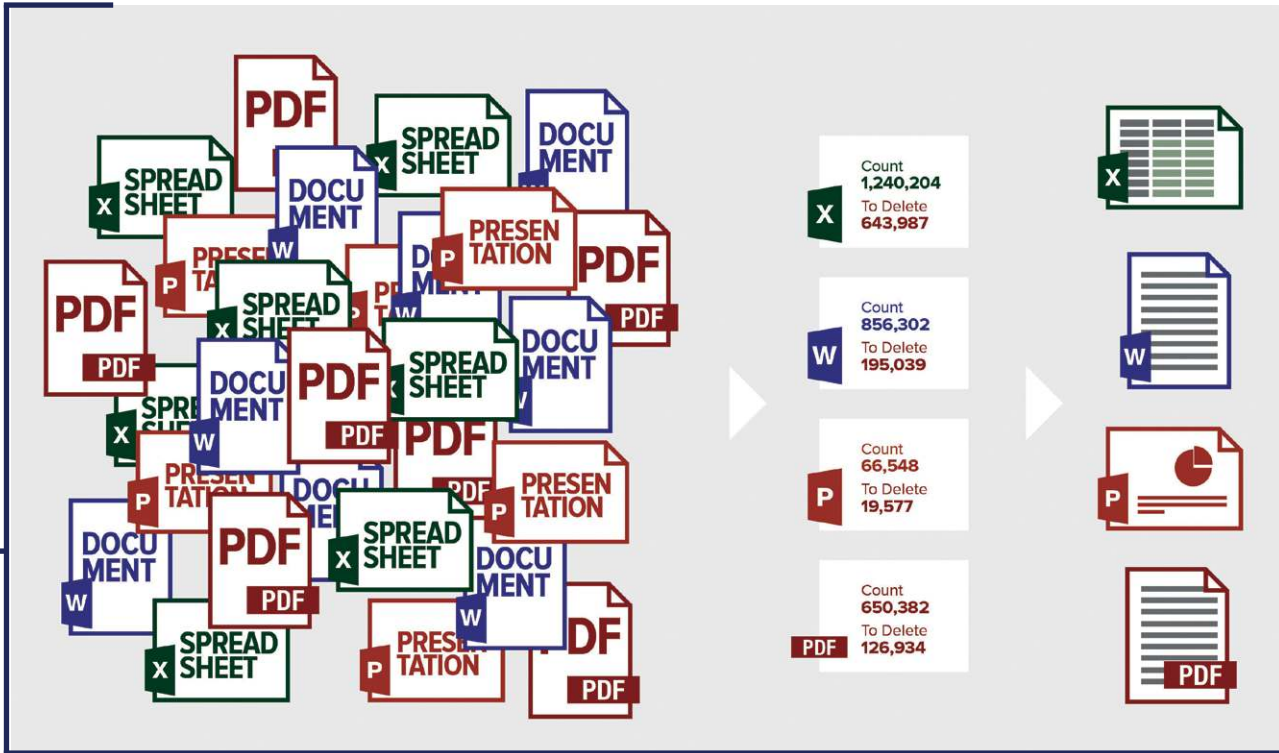
Some of the most challenging risks to identify are those where data is making an unknown and unsanctioned journey through document drives. These can be as simple as a headcount spreadsheet in HR containing employee data stored on a drive, or tenant application forms stored in document format feeding into downstream processes. Ensuring these are catalogued and indexed is a key aspect of complying with GDPR processes, such as the right to be forgotten.

Retention policies are notoriously difficult to apply to documents, yet both regulatory and internal policies are often breached by documents containing personal and sensitive data. The complexity is in discovering where these documents are and what policies have been applied to them; the right software tools can greatly accelerate the journey and mitigate the risks.

Counting the cost

Leaving risks aside, the costs to a housing provider of storing the same document multiple times soon escalates in both financial and environmental terms.

Common practices include iterating version numbers of the same document, downloading the same document multiple times or sending a copy of a document to multiple recipients. While solutions such as OneDrive and link-sharing have contributed to reducing this issue, old habits die hard. As with the duplication of data in a database, this practice requires unnecessary storage and the management of significant amounts of (duplicated) data at a cost to the business.



There is an energy and material overhead too. This overhead may seem to be small at a local level, but globally, accounting for the energy used by datacentres, the materials used for storage and the lifespan of drives, there are significant environmental costs because of unnecessary document retention.

Quantifying the problem

To start improving document management, the state of the document space must first be understood. We need to be able to answer questions such as: how many documents do we have; how much space is taken up by duplicate documents; where are my documents stored; and are we retaining information that we should have disposed of?

Here again, the right software can help. The goal is to consolidate all the information that can be retrieved from documents into an accessible and manageable platform. This will allow a business to search for critical information, such as last modified date, document size, document title, author and other metadata.

The second crucial element is being able to search not only the metadata but also the contents of a document. There are a number of methodologies for this; the one we have found to be the most useful is condensing the document content and storing it alongside the metadata. Although this is duplicating the information, a good data management tool can then interact with the information and provide transformational functionality.

Change the future

Consolidating document data into a searchable format is half the journey; the other half is leveraging the technology to change the way documents are managed, understood and, most importantly, used to improve outcomes.

Once indexed, applying data-quality rules to the information retrieved from documents is a powerful capability. Processes that produce the most document issues can be redesigned, and documents that breach policies or regulations can be dealt with by the business.

The highly changeable nature of documents means interacting and monitoring must be as continuous and as automated as possible. This is normally achieved by regular scanning of file servers, mailboxes and other resources, and the application of data-quality rules to identify documents requiring action. It's important to treat document discovery and management not as a single, one-time project but as an ongoing component of the organisation's overall data management strategy.

Ideally, document analysis is a two-way street. On the back of the resolution of issues, the business should set and enforce document standards. A tool that automatically issues these instructions increases confidence that document data adheres to policy and allows organisations to demonstrate that data is managed pro-actively across your document and production system space.

By applying tried and trusted technologies, combined with the latest in algorithmic natural language processing, modern document management software can liberate businesses from the burden of manual document maintenance activities, and provide their processes with higher quality, more reliable data to drive the organisation forward.

Stephen Burnett is a senior data consultant at IntoZetta.





Housing in 2035...

Mark Holdsworth, Sales Director, Civica

Home working, green spaces and energy efficiency – uncovering housing priorities for the next decade; Civica's Mark Holdsworth looks ahead to the future of social housing in 2035.

Today's housing providers are facing tightening finances while balancing affordable rents. They're trying to be more responsive to the resident voice. They're having to meet new and sometimes inconsistent policies. And, recently, they're having problems finding and hiring new staff. There's no shortage of challenges in this sector.

The issues the housing sector has had to overcome will have a big impact on communities well into the future. In a recent roundtable discussion hosted by Civica, we set out to ask: what will social housing look like in 2035?

To uncover some common trends in the housing sector, the session began by looking at what challenges organisations are facing today. Responses to these challenges will have a strong bearing on the nature of social housing moving forwards.

Today's main challenges

Many specific issues come back to finances. Some organisations need to pay for extensive retrofitting, such as insulating older homes, while others are preparing for potential future upgrades such as moving away from gas heating. At the same time, the need for expenditure has to be balanced with affordability for tenants.

Other challenges include finding innovative ways to give residents a voice, especially since many in-person meetings have been put on hold because of the pandemic. The pandemic has also caused an increasing number of residents to fall behind on payments, although this on its own hasn't been a major financial burden for most housing providers.

As well as the operational challenges, inconsistent policy changes are also becoming an issue. Some organisations are wary of acting too quickly in fear of making mistakes or spending money on something that is simply the current flavour of the month.

A transitional time

The range of challenges discussed in the session highlighted a general sense of uncertainty. Changes in the sector, such as new policies coming into force, a broad shift towards greater tenant rights and sustainability initiatives, are welcome but still far from clear. Organisations are already facing a backlog of tasks, with the pandemic only compounding the problem.

The situation is complicated enough in England despite the release of the government's green and white papers. But in the other nations of the UK, there is even more uncertainty. For example, Northern Ireland is in a politically unstable period and there's no legislative background to support changes in housing infrastructure.

Looking ahead to 2035, it's clear that the pandemic has accelerated many changes that were already happening. As organisations adapt to life after lockdown, there's a need to rethink what home and office spaces will look like in the future.

Home vs. office

Many organisations have adopted a hybrid approach to working; for example, asking employees to be in the office for a minimum of three days per week. Some have found that staff are coming in more than the minimum due to



a difficult home working environment and as they realise how much they miss when working remotely.

The water cooler moments aren't just idle chit-chat. Innovation seems to have suffered throughout the pandemic, despite productivity remaining high. There was a strong sense from attendees at the Civica session that remote tools are no substitute for face-to-face meetings, especially when important decisions are involved.

Home offices have become valuable and desirable spaces. Housing organisations developing new stock will need to think about what they can offer and the effect this will have on space and density. With the Scottish government offering additional grants for new builds with office space, there are signs that the home office is here to stay.

More people working from home has put the high street in more trouble than ever. This presents new opportunities for housing organisations, but many are also aware of their responsibility to wider society. The sector needs to be involved in 'placemaking' discussions, following the example of areas such as Exeter that are working to revitalise their communities.

Insights from the session

- With so much happening, it can be tempting to focus on big strategic changes. But it's important to remember the day-to-day aspects too, such as making sure current housing stock is in great condition and looking after residents.

- There are increasing numbers of opportunities to expand as town centres evolve and new premises become available. However, a community isn't just a home and developments need to be carefully planned to maintain the local community eco-system.
- With organisations offering more flexible working arrangements, it's more important than ever to get staff on board with the wider social mission. Without the right staff engagement, new team members will leave, and customer service will suffer.
- Fire safety and sustainability are still key issues, but since the pandemic, new trends have emerged. These include financial constraints in the face of affordable rents, customer-service issues resulting from staff wanting to work from home, and a new appreciation of the value of green spaces.

These challenges and the sector's responses to them will shape what social housing will look like in 2035.

Mark Holdsworth is the sales director at Civica.

CIVICA

Loreburn Housing's new HomeMaster HMS



Gary Alison, Director of Property & Development, Loreburn Housing

Loreburn Housing's director of property and development, Gary Alison, describes how the housing provider's implementation of the HomeMaster housing management system from Designer Software has been a 'game changer' for its business and financial operations.

We decided to move to an agile working environment back in 2017 but our incumbent housing management system was a serious impediment to achieving that, so when I joined Loreburn Housing in 2019, we decided to replace our HMS.

We identified several options and contacted the team at Designer Software for a demonstration of HomeMaster; its functionality combined with its simple cost structure and zero implementation fees were our main reasons for wanting a closer look. We then found that not only was HomeMaster the most cost-effective of all the housing management systems we considered, but it was also the most impressive. HomeMaster offered us a single, fully-integrated housing and finance management system, specifically designed for agile working.

Before we signed the contract, the Designer Software team demonstrated HomeMaster to all of our staff because our executive team was keen to achieve universal buy-in. These demo sessions were very useful because they allowed end-users to ask questions and clearly define their requirements; 95 per cent of their requirements could be immediately achieved on implementation, with the remaining five per cent developed soon afterwards.

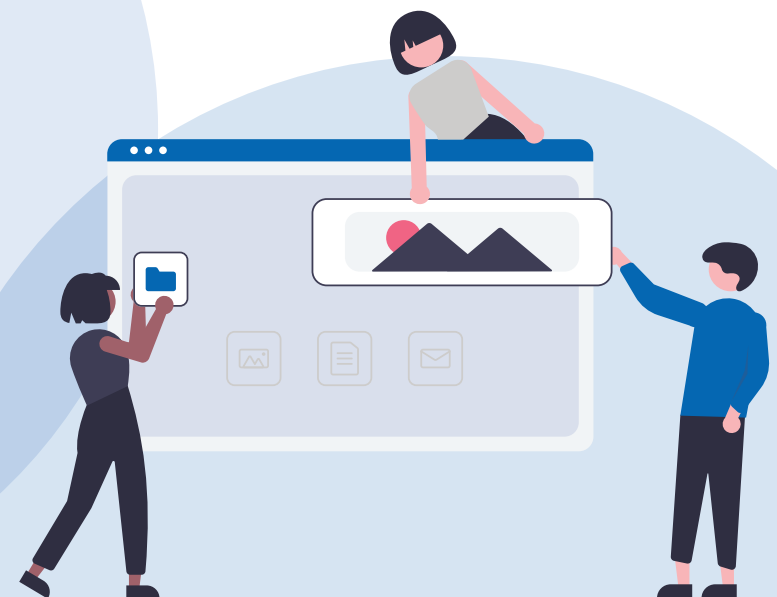
For example, we needed an additional service charge module, so a scoping meeting was held a week after signing the contract, and a working prototype was available within just three weeks.

Implementation

Prior to the implementation, we completed a data-cleansing and reformatting exercise so that all of our data could be migrated to HomeMaster in a consistent format, albeit from numerous disparate systems.

The implementation began in January 2020 and HomeMaster went around five months later. In my experience, I would normally expect this type of project to take 12-18 months. During the implementation, the Designer Software team was always on hand to answer any queries and the response times were excellent, with system changes made almost instantly, completely exceeding our original expectations.





Loreburn Housing has limited IT resources so we assembled a project team from different departments. Designer Software then trained up our project team to deliver training to the rest of our staff. This resulted in a sense of collective ownership which enabled us to truly embed HomeMaster into our organisational culture and working practices without being wholly reliant on our internal IT resources.

Functionality and efficiency gains

HomeMaster has eliminated our need to use five other business applications, such as an arrears tool and electronic document management, because these functions can now be managed within HomeMaster. The Designer Software team also integrated our existing Total Mobile and M3 Locator applications with HomeMaster so that data flows in real time between the products but with just one point of entry.

This has created significant time savings and efficiency gains as well as helping us deliver exceptional customer experience; our operational staff can now spend more time in their communities while still having easy remote access to all the information that they need.

Our customer-service staff and other front-line workers now have access to real-time data when answering tenants' queries, and by having access to all relevant parts of the HomeMaster system, they can see the bigger picture around each property or tenant, enabling them to take a more holistic approach to customer service.

The real-time data and management information from HomeMaster is also helping our executive team make better-informed decisions. Loreburn Housing's director of housing, Sue Irving, said, "Real-time data is available in several formats; the HomeMaster dashboard, quick-access tiles and reports. This means that all processes are clear and transparent, allowing greater clarity and more objective decision-making, rather than relying on anecdotal or inaccurate information."

Cost savings

Switching to HomeMaster, combined with the implementation of our 'hub, home and roam' model for hybrid working, will enable us to make over £250,000 of cost savings:

- £50,000 from licensing and maintenance of systems that are now obsolete (per annum);
- £50,000 from staffing costs by reducing the duplication of work;
- £50,000 from office costs due to switching to agile working (excluding repairs and maintenance);
- £100,000 from savings on previously-identified development costs for new functions which are instead available in HomeMaster.

Strategic objectives

Like most organisations, the pandemic accelerated our move to agile working. HomeMaster enabled us to deliver a safe, robust and efficient mobile working solution, with Loreburn Housing now operating a 'hub, home and roam' model to give our staff flexibility around where and how they work.

To summarise, the key reasons for our switch to HomeMaster were:

- Robust and easy-to-use cloud-based platform for agile working;
- Cost-effective solution;
- A comprehensive offer, with fewer bolt-on products required;
- Real-time performance data;
- Fast and responsive service;
- An effective, responsive partner.

Gary Alison is the director of property and development at Loreburn Housing.

West Kent Housing's £830k Civica deal



West Kent Housing has signed a £830,000 deal over seven years with Civica for its cloud-based Cx Housing, Asset Management and Contractor Workforce software. The all-in-one housing platform will replace West Kent Housing's numerous business applications and spreadsheets with a single cloud system to give one source of data, improved automation and up-to-the-minute reporting.

The new platform will be used to support key activities such as tenant self-service, repairs and maintenance, tenancy enquiries, rent and arrears, and service charge processes.

As part of the housing provider's core objective of moving more services to the cloud, Cx will offer better connectivity. For example, maintenance and repairs operatives will have the flexibility to work anywhere, anytime, with all the

information needed at their fingertips to resolve tenants' problems quickly and efficiently, and tenants will be able to complete more activities online via the Cx portal, such as uploading images for repairs, report anti-social behaviour and manage their rent accounts.

Cathy McCarthy, housing director, West Kent Housing, said, "The real value of the Civica platform is that our staff will be able to spend more

time adding value for our customers. A single cloud system and better-connected data mean we can see the full picture of a property or tenancy and act faster to resolve any problems."

Looking ahead, Civica and West Kent Housing expect to jointly explore artificial intelligence, virtual reality, building information modelling and the internet of things.

| FINANCE MANAGEMENT

Wrekin kickstarts digital transformation with Advanced



Wrekin Housing has embarked on a widescale digital transformation programme, starting with the adoption of Advanced's Cloud Financials software.

As a real-time, cloud-based solution, the housing provider's new budgeting and forecasting system is based on live information; all changes to data are immediate and reporting processes that previously took days can be completed within hours. Wrekin Housing is also introducing a new purchasing system which will highlight cost savings and automatically recalculate budgets against spending.

The housing provider said that Cloud Financials from Advanced will enable greater agility and make things

much simpler for its staff. They will need to spend less time on reporting and have greater access to accurate, real-time information for better planning.

Jon Lamb, executive director of finance, Wrekin Housing, said, "Most of our finance team are currently working from home and, as the past year has demonstrated, the ability to maintain secure and effective working practices remotely has been critical. Implementing Advanced's Cloud Financials will allow staff to work effectively wherever they are, using the same real-time data."



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Pivigo predicts tenants' arrears

Pivigo has developed AI software for housing providers to predict when tenants are likely to fall behind with their rent, up to six months before it happens.

As well as looking into the future, Pivigo's Rent Arrears Prediction platform distinguishes between high-risk and/or chronic arrears' cases and temporary cases, enabling housing providers to focus their staff resources more effectively, as well as move away from enforcement activities, such as evictions, towards engaging with tenants around positive preventative measures.

Alex Willard, CEO, Pivigo, said, "Our technology gives housing providers a new ability to see far over the horizon. We've trained our AI platform with tenancy data from multiple housing providers to develop an accurate and reliable model to predict future arrears and understand the likelihood of those arrears becoming a long-term problem.

"Importantly, our software differentiates between high-risk cases and temporary cases, enabling housing providers to make smarter use of their resources.

"Our Rent Arrears Prediction platform is cloud-based, can be deployed in just eight weeks and integrated with the majority of housing management systems. We want to make the benefits of AI accessible across the entire social housing sector, regardless of whether the housing provider is large or small, technically advanced or on a budget."

Pivigo's 'propensity to pay' algorithm uses data from a wide variety of sources including tenant, household, property and rent information; weekly rent account balances; payment history; gross income and benefits; and repairs and compliance visits.

Pivigo said that other arrears management systems only issue alerts once a payment has been missed. By making tenant-

specific predictions of arrears up to six months in advance, Pivigo's AI provides actionable insights into tenants' 'propensity to pay' and then suggests optimal repayment plans for long-term cases that have the best likelihood of being kept to.



Alex Willard,
CEO, Pivigo



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The HomeLINK Dashboard

Data is extracted from all connected alarms and sensors with actionable insights presented on the dashboard, segmented by high, medium and low risk.



The Resident App

With the HomeLINK Resident App, residents are provided with a healthy home rating, handy advice on how to improve the quality of their home, and Fire and CO alarm testing reminders.

Q&A with Thirteen Housing

– Dealing with service charges



Rob Thompson, Head of Finance (Income), & Emma Parker, Senior Business Partner (Income), Thirteen Housing Group

A Q&A with Thirteen Housing Group's Rob Thompson, head of finance (income), and Emma Parker, senior business partner (income), both of whom are primarily focused on setting service charges and rents.

What problems did you have with service charges?

Emma Parker, senior business partner (income), Thirteen Housing Group: There were a few challenges for us to solve! Around 10,000 residents across our housing portfolio are eligible to pay service charges. Those residents are spread across 1,000 different blocks or schemes, and each of those schemes had a separate schedule set up in Excel. Then within each block or scheme, people pay different service charges, so we could have a variation of, say, five different service charge schedules across five sheets in the spreadsheet.

Those sheets were updated annually by hand for our annual service reviews. We also had a spreadsheet for every scheme to show how we'd collected funds to replace assets in the future. Those financial figures were then added to a master balance sheet, taking three to four weeks per team member, so around 10 weeks in total to update the sheets.

For a small specialist team, managing the data input and ensuring accuracy and attention to detail was so time-consuming. We really needed to automate the processes in order to be more transparent for customers and to break down their charges so we could be sure they were correct.

Didn't your HMS have service charge modules?

Emma Parker: It seems that many of the housing management systems do have a service charge module, but they can't deliver the detail broken down into cost

centres or at unit or scheme levels. These modules are add-ons so you need to use a particular HMS to get anything from its service charge module.

We wanted a solution that could sit on top of what we already had and integrate with it. So even if we later decided to move away from our current HMS, we would still have a service charge module that would integrate with whatever we then chose as our next HMS.

How did you discover Trace Solutions' BlueBox?

Rob Thompson, head of finance (income), Thirteen Housing Group: I'd heard from Peabody Housing about Trace Solutions' BlueBox software, plus I'd seen how Peabody (and prev. Family Mosaic) had been able to break down their information in the service charge booklets given to residents.

I was intrigued by the level of detail it contained and how the system had broken it down in the first place. We wanted a system that could grow with us, but also extend to other areas such as rent setting. BlueBox offered all that, so we added Trace Solutions to our list of vendors in the tender process, and consequently ended up buying BlueBox.

What can you do now that you couldn't before?

Emma Parker: We currently have 80 per cent of our stock up on the system and working. The rest is being implemented now, although admittedly that's the stock with greater inherent complexities to deal with. Once

they've been added to the new solution, we'll be ready to move to the next phase.

We found that you really do need to understand your data before you begin the project. And don't underestimate the complexities of service charges; you need input from the wider organisation so that you can be clear about what you want the end result to be.

We chose to set up BlueBox on the basis of three levels: estate, property and unit. Any changes to tenancy and lease data are all automatically updated every day via an interface from our HMS direct into BlueBox.

For the 80 per cent of properties set up so far, we've matched these to creditors, expense types and schedules to easily identify which units pay towards, for example, emergency lighting. We chose to load data going back to 2019/20 so that we can pull reports and data at the touch of a button for the last couple of financial years, plus no more manual number crunching!

We can also pull reports for units where we're unable to charge service charges to see what the costs are and how much we're unable to recover, so that in future, we can work out what to charge new tenants.

We can also work out the service charge portion of an affordable rent scheme, where everything is included in one payment, so again we can see what's not being charged out. And everyone can now see what costs comprise each service charge – in other words, how much we're collecting for each granular service. For example,

if somebody asks, 'give me the door entry charges per scheme', we can tell them.

Rob Thompson: Best of all, by automating so much, we're making better use of our resources and letting the technology take the strain in the number crunching. We have to be conscious of value for money and BlueBox means we can grow without needing to expand our existing team significantly.

So many of our processes are now far more efficient, allowing resources to be used much more effectively. And the risk of human error has been considerably reduced.

What's next?

Rob Thompson: We are currently focused on getting the remaining 20 per cent of complex schemes loaded into the system, at which point we'll be able to use the reporting suite to its full potential.

We'll then look at the rent-setting solution, and as leasehold laws become more complex, we'll be looking to make use of BlueBox's Section 20 functionality; the more that can be automated, the better!

Rob Thompson is head of finance (income) and Emma Parker is a senior business partner (income) at Thirteen Housing Group.

Mobysoft and Manifest's integration partnership

Mobysoft and Manifest Software Solutions have formed a partnership to help housing providers reduce arrears at the same time as breaking down the data siloes caused by 'application spaghetti'.

Mobysoft is best known for its RentSense software used to combat rent arrears, while Manifest specialises in integration software and services for housing providers. The partnership will enable housing providers to integrate RentSense with their housing management and CRM systems through Manifest's universal adaptor.

Paul Evans, commercial director, Mobyssoft, said, "Many of our customers want to integrate their myriad systems; Manifest's reputation in our sector for helping housing providers to do exactly that is unrivalled. This partnership will help our customers integrate RentSense across their IT estates."

Alan Swift, technical director, Manifest Software Solutions, said, "Our focus is helping our customers maximise the returns from their technology investments by providing fully-supported integration solutions; the challenge many housing providers face is getting their systems to talk to each other."

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Housing Technology Guide to CRM & Omni-Channel 2021

We have just published the Housing Technology Guide to CRM & Omni-Channel Communications, with support from Aareon UK. You can order your **free** copy of the guide now from housing-technology.com/research.



• Embracing digital customer experience

Orbit's experience of integrating its brand and 'tone of voice' into all of its digital customer experiences to avoid the housing provider and tenant relationship being perceived as entirely transactional.

• Retail, shopping and tenants' omni-channel experience

What can housing providers learn from the retail sector when delivering seamless end-to-end omni-channel services to their tenants?

• Driving digital transformation with better UX

Aareon explains the importance of focusing on predictable and intuitive user interfaces combined with contemporary user experiences for tenants and housing staff alike, particularly where large quantities of complex data need to be handled and displayed.

• Wiltshire Council's Aareon 360 Customer Portal

Full omni-channel self-service combined with the ability for tenants' data to be captured once and then shared across the organisation via 'a single source of the truth'.

• Connected homes & tenants

Housing Technology interviewed a number of senior executives on the alignment of omni-channel communications with smart/loT-enabled homes to improve tenants' lives while helping housing providers' operational performance.

• Omni-channel or omni-shambles?

Housing providers are increasing talking about adopting a multi-channel communications strategy, but how should it be done, what are the benefits to tenants and housing providers, and are the IT suppliers ready with the right solutions?



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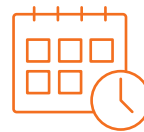
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Behind the scenes at the Resident Voice Index

Doug Sarney, Resident Voice Index Principal, MRI Software

Sometimes the tools we have to hand don't quite get the job done and when that happens, you might need to build new tools yourself. The team behind our Resident Voice Index initiative here at MRI Software came up against just this problem; our solution was to build our own custom data-analysis tools.



The Resident Voice Index recently published its first report, in which nearly 4,000 UK social housing residents were asked about their feelings and perceptions of their neighbourhoods and housing providers. To draw out actionable insights from the data, custom technology had to be built to offer sophisticated ways of analysing the 'associated question' results and interpreting the qualitative responses.

Why was a custom build necessary?

We did our research before choosing to build specifically for the project, looking closely at the source collection tool and weighing up options with other available solutions. What we quickly realised was that the collection analysis tools didn't do what we needed; we had a vision for a deeper level of data analysis. One difficulty we came across when trying to interpret the data was the ability to associate the answers of one question with the answers to another. It was a big problem!

Our BI architect behind the Resident Voice Index tools was Naveen Hadagali. He explained how flexibility drove the decision to build for the Resident Voice Index: "It gives us ways to analyse the data by applying statistical and logical techniques that help in deriving insights. More importantly, it is scalable, flexible and intuitive to use."

The benefits of building your own

For the Resident Voice Index questions, we asked about a variety of topics, covering belonging, caring and safety. We wanted to find hidden information and deeper insights so the technology needed to be able to uncover associations between seemingly unrelated topics and questions.

The ability to link answers gives you the power to create different subsets of the data. The benefits of this are that you can begin to explore those relationships which you otherwise wouldn't be able to reveal. Our tools give us the ability to identify all the people that thought one way about question 'A', make them a subset and see how they behaved or answered other parts of the survey. That could be any part of the survey; for example, what people who 'felt safe in their neighbourhood' thought about 'positive contributions made by their housing provider'.





Moving on from that, the ability to cross tabulate the results was developed. For example, those who answered this way with question 'A' and that way with question 'B', against a third set of data, such as their age or location or the answer to another question. This really allowed us to identify some of the niche results that wouldn't have been found using conventional off-the-shelf tools.

Dealing with qualitative responses

Another benefit was the work that Hadagali's team did to build capabilities for dealing with qualitative responses. A result that was uncovered in the first survey was people suggesting things such as 'community spaces' or 'community events', which built a picture of what the respondents wanted to see or appreciated in their neighbourhoods. We developed an algorithm that enabled us to associate words with each other when they were clearly linked in the respondents' answers. Some other platforms only analyse individual words and as such, the analysis would have been weaker and less enlightening, giving flat answers of 'community', 'spaces' and 'events'.

Part of our build included carefully selected points of intervention where our human researchers can make edits so that they can see more intuitively what was meant by people's qualitative answers. We were very careful not to doctor (or 'munge') any of the data, while making sure that perfectly good data wasn't written off or separated from its appropriate groups. For example, by acknowledging spelling mistakes or by excluding extraneous data and profanities that added nothing to the insights.

We removed the word 'good' from a word cloud analysis. When we asked for positive contributions regarding people's housing providers, the answers naturally included things such as 'good communication' or 'good repairs', but the insights didn't need to know that it's

'good' because we asked for 'good' things in the question. Techniques like this exclude the obvious words that would otherwise dominate, drawing out the data that matters for reporting purposes. As the project continues, we expect these capabilities to evolve and grow.

Constant and deliberate improvement

We are now developing the second survey of the Resident Voice Index and the tools built for the first survey will be tested against a new set of data. Hadagali and his team are excited to see how the project grows from this point: "We're going to extend our existing framework and strengthen the sentiment analysis and text analysis.

"In the future, we will make the tools flow much more seamlessly so that you'll be able to see on-the-fly what impact a change may have rather than waiting for a day. Soon, we'll be able to quantify the qualitative input much more easily, working to build an intuitive framework that can really uncover business intelligence from what people say."

We are sharing the Resident Voice Index as a showcase for MRI Software's business intelligence capabilities. We wanted to parade the skills that Hadagali's team has to build great tools and solutions, at pace and against unique specifications. What's more, the tools that we develop can often then be applied across other MRI solutions.

Readers can view the results at residentvoiceindex.com.

Doug Sarney is the Resident Voice Index principal at MRI Software.



Designing for inclusion –

Transformation, change, digital & people

Cher Lewney, Principal Consultant, Altair

The housing sector is heavily regulated, with housing providers required to support and improve the lives of tenants while meeting a number of regulatory requirements. It's therefore vital to keep on top of areas such as finance, maintenance and repairs, tenancies and voids, contractors and partner agencies and much more.



Inclusion by design

Tenants want and usually expect to be able to self-serve at a time of their choosing; the time of weekday-only, office-hours services is over, and this has been accelerated through necessity by the pandemic.

Housing providers of all sizes have huge programmes to transform delivery; to use existing technologies to modernise the way they work, and to design and embed emerging technologies to make things smarter and more efficient.

This is obviously to be welcomed but are we doing enough to consider the needs of those who already potentially face exclusion and barriers in their lives, as essential services are digitised? 'Digital by design' is a concept that is now well recognised in our sector, but have we given enough thought to 'inclusion by design'?

Risk factors

The digital divide and risk of exclusion of some of the most vulnerable people in our communities could be exacerbated by the digital acceleration unless this is explicitly factored into service design from the outset.

The issue of skills and confidence is widely recognised, particularly in relation to older people, and many housing providers offer training to help tenants get online and

develop the skills they need to build technology into the way they bank, shop, keep in touch with friends and family, and access services and support.

But training itself may not be enough to build the confidence needed to change a lifetime of habits. Everyone learns differently so housing providers should be thinking about the outcomes they want, in terms of sustained changes of behaviour rather than focusing on a blanket roll-out of high-level skills.

When organisations recognise that they need more digitally-literate staff to support new ways of working and roll-out training purely via e-learning, it's vaguely on a par with 'we know you don't speak French, but we're going to deliver our training in French nonetheless...'

We can do better...

However, even while recognising these limitations, other risk factors that our tenants face from digitisation appear to be less consciously considered or built into the way we are designing and launching digital services at the moment.

For example, we know that people with lower incomes are more likely to be on monthly data plans and therefore might have reduced access to online information and services at certain points in the month. This lack of access

could potentially result in a vulnerable applicant missing a property they are eligible for if the only way to access a choice-based lettings system is online during a specified window each week.

While one could argue that people can access laptops in public spaces if it's important enough for them to do so, we could do more to reduce the impact of this by considering changes to advertising or allocations processes; perhaps flag where people may not be able to bid and automate an expression of interest for example? It's not rocket science, but if we plan for the realities of each of these risk factors in the design of our business processes and systems, we can help to reduce any negative impact they might have.

Also, are we confident that our systems are consistently fully responsive and accessible via mobile phone (as opposed to via tablet, laptop or desktop) so that people aren't discouraged from using services because the user experience is poor? Again, lower-income tenants are more likely to only have digital access via a mobile device, so if a system works less well on a smaller device, the impact it has for them is disproportionately greater.

Similarly, are translation tools built-in for all customer-facing processes to provide easy support for customers whose first language isn't English? If so, how robust and accurate are they and are there appropriate escalation processes if something goes wrong or a situation becomes too complex to automate? The customer shouldn't disengage because the service just stops or because they don't know what to do next.

Where customers have physical disabilities, can they access support to help them engage with services appropriately or is there an expectation that they will do it via an advocate (which could be discriminating in its assumptions or have a range of unintended consequences)? Are accessibility tools considered in the way that services are delivered digitally, in order to support issues with mobility, vision, hearing, neurodiversity or even mental health?

Similarly, are assistive technologies understood and considered in the way that services are offered to people with learning disabilities? Does the business process design focus on the application of a standard experience for all customers,



or can it be tailored to the individual (for example, to support independent living in a wider range of scenarios) to allow people to live more equally?

Core principles

Across the sector, as new digital channels are introduced to contact centres, it's important that all customers have the same quality of experience, regardless of their channel of access or personal situation.

Use of digital technology undoubtedly offers new ways to address some of the barriers to inclusion, but an investment in 'inclusion by design' needs to be embedded as part of the digitisation process from the outset.

Cher Lewney is a principal consultant at Altair.



What's the problem?

Managing formal complaints with Dynamics 365



Jordan Wheat, New Business Consultant, Crimson

In the last edition of Housing Technology, I discussed how mobile apps, portals, virtual agents (AI-enabled chatbots) and other digital channels can help housing providers manage issues such as repairs and anti-social behaviour. The next stage of this process is managing formal complaints, including escalation to the housing ombudsman's complaints process.

Listening to tenants

In the Charter for Social Housing Residents' whitepaper, one key issue highlighted was that tenants "didn't feel listened to when they raised concerns and complaints". Our recent 'housing breakfast' webinar showed housing providers how to manage issues, but the next step is managing customers' complaints and in doing so treating tenants with dignity and respect.

Tenants sit at the heart of social housing, and tenants expect to have their complaints dealt with promptly and fairly, alongside access to fair redress from the ombudsman. Complaints management is not only key to customer satisfaction, but the number of complaints can also provide insights into how the housing provider is operating and highlighting the ways it could improve.

Ultimate case management tool

Dynamics 365 is the ultimate tool for case management. A complaint can enter the process via a simple email, which in turn triggers the creation of a case, an auto-reply email, and the case is then entered into a queue. It's then assigned to a case worker, who has a conversation

with the complainant to either resolve the complaint or escalate it to the ombudsman.

Because Dynamics 365 enables customers to raise complaints at every lifecycle stage, through a virtual agent, contact centre or online, it is suitable for all ages, abilities, and technologies. Complaints can be automatically passed to the relevant department, with SLAs to ensure complaints are handled quickly.

Speed and accuracy

As a cloud-based platform, Dynamics 365 can be accessed anywhere, allowing housing providers' field-based staff to log, update and resolve complaints remotely. Not only does this ensure details from home visits aren't forgotten, but it also improves the accuracy and speed of the complaint-handling process for tenants.

Customer portals enable complainants to check the progress of their complaints rather than waiting for an update or chasing administrative staff. Tenants can log into the portal (which can also be used to submit complaints) which then leads them through a transparent process until the complaint is resolved or escalated. This reduces the administrative burden and cuts the customer service time, giving customer care staff more time to work on complex cases, and means tenants can access all of their information whenever and wherever they want.

Satisfied tenants are the key to a successful housing provider; while reducing complaints is the overall aim, the next-best option is to handle the complaints efficiently.

Jordan Wheat is a new business consultant at Crimson.

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M-Files buys Hubshare for next-gen tenant experience

M-Files has bought Hubshare in order to provide an information exchange platform and portal to strengthen housing providers' digital relationships with their tenants.

Hubshare offers a secure digital workplace portal that enhances end-user and tenant engagement through collaborative working, secure file sharing and project management tools.

Unlike most file sync-based document portals where information is copied from an enterprise content repository, M-Files now offers a secure and integrated system for internal and external collaboration without data duplication. While the M-Files user experience is optimised for streamlining internal document management processes, the new Hubshare

functionality in M-Files is designed for the provision of key information such as documents, people, processes, discussions and more to external users, such as housing providers' tenants, via a branded portal optimised for a better external user experience.

Antti Nivala, founder and CEO, M-Files, said, "The Hubshare acquisition helps us to deliver a better digital experience for tenants through timely information sharing and collaboration. Our integrated offering now extends M-Files from the back office to the frontline of our housing customers' businesses."

INFRASTRUCTURE |

Central wins Brighter Futures contract



Central has been appointed by Brighter Futures Housing as its dedicated technology partner for the next three years.

Central will be providing first-, second- and third-line support for the housing provider's 230-strong workforce. The IT provider will also be delivering managed IT services, including endpoint and patch management, capacity and availability monitoring, plus regular service and maintenance reviews.

Central's IT engineers are currently working behind the scenes to build a picture of Brighter Future's technology stack and digital infrastructure.

Paul Richards, interim head of contracts and procurement, Brighter Futures Housing, said, "The social and community work we carry out relies on us having 24/7 online availability.

"We chose Central not only because its tender was the most professional, but because having seen its wider work in the housing sector, we knew it would understand how to assess our IT infrastructure requirements."

IoT building moisture monitoring at Places for People

Places for People is trialling a small number of building moisture index (BMI) diagnostic systems to assess, monitor and protect its trial properties against excess moisture.

The housing provider is the first external user of the BMI technology, launched by the Property Care Association (PCA) following a three-year research project with the Institute for Environmental Design and Engineering at University College London.

The BMI system works by placing IoT devices, including environmental sensors, into different types of properties to measure conditions such as temperature and relative humidity. Bespoke software then uses the devices' data to show why an individual property is out of balance in terms of its moisture levels. The technology then suggests the correct solutions to address the issue.

Mark Winstanley, head of asset management, Places for People, said, "We've successfully used the BMI system to accurately identify the best way to reduce condensation and mould growth in tenants' homes. The clear reports also help us discuss with tenants how they can gain the greatest benefits from the changes we suggest."

Dr Paula Lopez-Arce, research scientist, Property Care Association, said, "The data we've received has helped us to create a picture of the issues surrounding excess moisture across a variety of properties including flats, bungalows, terraced and detached houses in different regions, to cover a representative mix of property types.

"With the BMI system, housing providers can now identify and quantify moisture problems better and evaluate targeted ways

to address any issues. The system helps to avoid costly repairs and, most importantly, improves housing quality and living conditions."

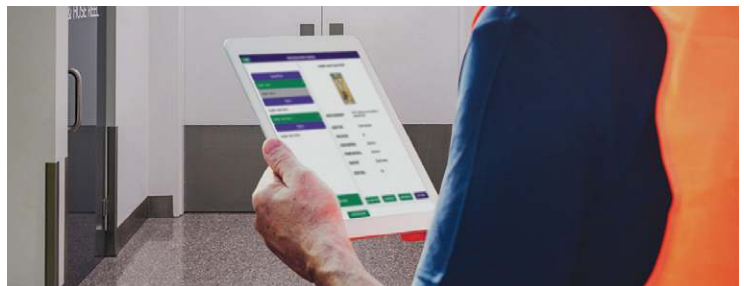
The PCA's BMI system is now available in the UK via Maple Research and Development.



Dr Paula Lopez-Arce, Research Scientist, Property Care Association

Regenda's Propeller Powered asset-tagging software

Regenda Group is working with Propeller Powered to deploy the software provider's Prop-FS fire door system across its properties. The Prop-FS digital toolkit comprises inspection scheduling, QR asset tagging, job management and reporting.



From the end of 2021, Regenda's fire inspectors will be using Propeller's mobile app to capture fire-door inspection outcomes on site, tagging all door assets as they go with QR coding to identify and record any door defects.

All data is logged in the Propeller platform, with priority actions raised for repairs against individual doors, instantly traceable via each door's QR code. The QR asset-tagging system can also be used by non-Propeller users, so that anyone with a smart device

can scan a door's QR code and access vital safety information about it online.

Mike Bradley, account director, Propeller Powered said, "A crucial element of all building safety data is the 'golden thread'. Prop-FS enables those with responsibility for tenants' safety to identify, understand, manage and mitigate risks relative to every door, all tied together by a unique QR code, throughout the lifecycle of a building, ensuring that the golden thread is instantly and clearly visible."

IS YOUR DATA HOLDING YOU BACK?



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INTOZETTA MIGRATION

Failed Data Migration is the most common reason for programme delay and cancellation. IntoZetta has delivered many of the largest and most complex data migrations in the housing sector. Our Housing Data Migration software and experienced consultants have supported migrations to and from Dynamics 365, Northgate, OPENHousing, Universal Housing, Orchard and more.



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www.intozetta.com



IoT cybersecurity – Attack vectors, fraud and data breaches

Simon Flint, chief information & digital officer, Aico

Many of us love our smart home technologies, from internet-enabled doorbells to intelligent boiler controls but very few of us really think about the technology that we put in our homes. The cost of a device or platform often plays a key factor in the decision-making process, with popular shopping sites offering numerous cut-price, no-name, smart home devices with features that seemingly offer parity with known brands and market leaders. It's heart-warming to see that smart IoT devices are now accessible to so many with the ability to transform people's lives.

However, if every IoT device in your home is viewed as a potential attack vector or as the source of a privacy breach, the picture of your home may be bleak. Imagine if the camera you've bought could be accessed illegally by another person, if the boiler controls in your house could be manipulated without your consent or if all smart smoke and carbon-monoxide alarms were maliciously activated remotely.

These may seem like unlikely scenarios more suited to a Hollywood movie but the media is full of examples of companies whose devices have been compromised in such a way, including smart thermostats, wifi-enabled baby monitors, children's toys and smart doorbells.

Security by design

However, let me also offer you some reassurance. Not all IoT devices or platforms are equal and therefore the risk of a device being compromised is also variable. Some companies design their entire platforms with security in mind to reduce the risk that any single component could be compromised and therefore prevent the device ecosystem from being abused. 'Security by design' from the ground up should be a proactive ethos for all technology companies rather than retrospectively adding security to your platform and devices to address security holes.

Common standards

Common standards have long existed for internet-facing components such as websites and web services but IoT is a relatively new area, so the quality of standards has varied greatly. Industry peers have recognised this deficit and have worked together to define standards for the



IoT industry as part of recognised bodies such as the IoT Security Foundation. This helps to ensure that there's a known good starting point for all members, learning from collective experience in this area.

Independent verification and accreditation

The BSI Kitemark for IoT devices was introduced in 2018 and offers consumers further assurance that the security of their devices has been independently assessed by a leading, independent industry body. Very few organisations have achieved this benchmark so including this as part of your procurement specification will give you added confidence that your IoT devices are secure.

Commercial liability

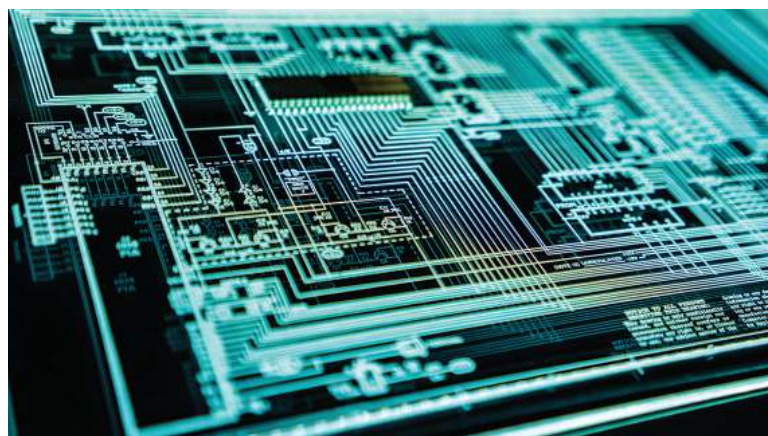
Ensuring an IoT device has a genuine CE mark may seem obvious but it establishes a clear line of responsibility for the manufacturing of devices as well as conformity to established health, safety and standards within the EEA. This standard is often abused and fraudulently represented by cheaper offerings so performing due diligence before procurement to ensure IoT devices adhere to it could be a simple but effective way to reduce risk. The inability to satisfy CE requirements should be a warning sign that other areas, such as security, are likely to have been neglected.

Another risk mitigation measure is to ensure that any IoT vendor you engage with is in full control of their data transmission and processing to prevent 'man in the middle' attacks and to ensure that end-to-end commercial liabilities are in place. Some long-range, low-powered IoT devices use non-commercial data processing platforms

which present a long-term operational risk as well as a commercial liability risk in the event that the devices or platforms are compromised.

The future of the connected world looks bright and strong cybersecurity is the backbone needed for the IoT landscape to flourish. Simple due diligence will help to ensure that you make smart choices when it comes to device and platform selections.

Simon Flint is the chief information and digital officer at Aico.



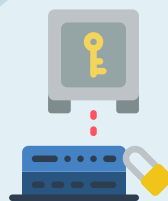
Cybersecurity – What's the problem?



Gerard Joyce, CTO, CalQRisk

The problem is that cybersecurity is everybody's problem and unless every department is involved in discussions on the solution then no solution will be truly effective.

The USA's National Association of Corporate Directors (NACD) puts it very well in its Cyber-Risk Oversight Handbook: "Directors need to understand and approach cybersecurity as an enterprise-wide risk management issue, not just an IT issue".



plans, tenant information, financial information, employee information and so on). We will also look at what can be done to minimise those risks and keep information confidential, accurate and available.

It's more than just keeping the bad guys out, more than firewalls and intrusion detection, and more than just spyware and malware. It's about protecting your corporate integrity, such as making sure that the data your published reports are based on is accurate and unaltered. It's also about availability, ensuring you, your staff and your tenants can access applications and information as and when needed. It's about people, their behaviour, sometimes careless and sometimes malicious. And it's also about prioritisation – what matters most and which information needs the most protection?

In this article, we'll take a look at the current state of cybersecurity and what organisations should be doing to keep the information they hold secure and private.

What does 'cyber' mean?

The word cyber could, depending on the context, be replaced by computer, network, virtual or simply 'very modern', but keeping information secure and private is not new. What is new is the multiplicity of ways ('threat vectors' in techno-speak) that can be used to access your information.

In the following paragraphs we will look at the threats and the vulnerabilities that together create the risks that threaten the achievement of your objectives with regard to your valuable information. (corporate strategies and

Where are the threats coming from?

Depending on your context and the nature of the information you hold, the chief threats could be one or more of the following:

- Aggressive competitors;
- Hostile nation states;
- Criminal organisations;
- Hackers and 'hacktivists';
- Disgruntled employees.



What are your vulnerabilities?

To access your information, they will exploit your vulnerabilities so it's imperative that you're aware of and address these. For a typical organisation, the vulnerabilities include:

- Unpatched flaws in operating systems and applications;
- Unwitting employees who are unaware of the methods employed by those who would steal and/or corrupt your data;
- IT system misconfiguration (akin to leaving the back door open);
- Mobile devices – whether under your control or not, they provide an access point to your information;
- Supply chains and service providers with poor cyber defences can offer an easy route to your information;
- Storing data in the cloud – do you know how secure it is?

Risk categories

The risks are what threatens the confidentiality, integrity and availability of your information. They include, but aren't



limited to the following:

- Denial of service attack – attacking your systems in a way that prevents legitimate users from accessing your information and systems;
- Extortion and ransomware – encrypting your data and demanding payment for the decryption key;
- Data breaches (external or internal);
- Data changed or manipulated maliciously;
- Spyware – stealing information and routing it to external parties;
- Identity theft – criminals masquerading as clients.

Managing your risks

The wide range of threats, vulnerabilities and resulting risks mean that the right solution requires a combination of preventative and mitigation measures. As you would expect, many of these have an IT component, but many are dependent on human behaviour and a sound corporate culture.

Preventing undesirable consequences can be achieved by a combination of the following controls:

- Policies and procedures – set the tone from the top and enforce good practice;
- Training and awareness – make sure people know your policies and procedures;
- Verify – train people to recognise attempts at identity theft and to follow strict rules on identity verification;
- Responsible person – have one person who 'owns' information security;
- Access control – only provide access to as much information as is required;
- Limited access between systems – only allow as much access as is necessary;
- Intrusion prevention – do you have secure and robust firewalls?
- Intrusion detection – do you know if you're being attacked?
- Integrity monitoring – do you know if information has been altered?
- Monitor the traffic – do you know what information is leaving your organisation?
- Backup your data regularly – know how much you can afford to 'lose';
- Manage all mobile devices that can be used to access your information;
- Train all employees on good practice when using mobile devices;
- Get a third party to verify your defences, such as a penetration test;
- Monitor adherence to your own rules;
- Incident response plans – have a plan for when it does go wrong.

Solution discussions

On an on-going basis, it's recommended that a cross-departmental group is formed to discuss how to address the many aspects of information security. You can't

necessarily assume that your IT department understands your business operations, so you therefore can't assume that they will have addressed all of your information security concerns. By involving people from across the organisation, you can be more confident that the solution(s) will be comprehensive and effective. If people are actively involved in designing a solution to a problem, they are then more likely to own it and implement it.

Some questions that this cross-departmental group should consider and which will help stimulate discussion:

- What information is sensitive, and how is it identified?
- Are there rules governing how sensitive information is to be treated?
- Who decides who has access to what information?
- How often do managers confirm that the access rights of those reporting to them are correct and appropriate?
- Have all legal, regulatory and contractual obligations regarding the information you hold been identified, and are there appropriate processes to ensure compliance?
- Have you outsourced any critical functions or activities? If so, is somebody responsible for ensuring that your service provider has security controls that comply with your policies?
- Do any of the products or services you sell include access to information systems? If so, are discussions on information security held at an early stage in the development of the products or services so that security can be built in rather than bolted on later?
- Do you actively restrict what can be downloaded and/or installed on computers?
- Does your HR department address information security concerns when recruiting or promoting people?
- Do you have robust processes around the sourcing and retention of information on which key business decisions are made?
- Do you have robust processes governing the transfer of sensitive data from your organisation to third-party organisations?
- Is somebody staying abreast of current threats and vulnerabilities and ensuring that your organisation's defences remain up-to-date?

Reasonable best efforts

And if you do buy cybersecurity risk insurance, remember that the insurance company will still expect you to have employed 'reasonable best efforts' to protect and keep secure the information that you hold. Have you?



Gerard Joyce is the CTO of CalQRisk.



Solving network headaches with virtualisation

Paul Fisher, Technical Consultant, Parallels

Mergers are never simple. When Platform Housing became one of the UK's largest housing providers after the merger of Fortis Living and Waterloo Housing, it inherited a major IT headache. How did Platform Housing go about solving an overly-complicated networking situation that came with a high price tag?

Unified but complex

Following the successful merger of Fortis Living and Waterloo Housing, the expanded organisation found itself with a disjointed IT estate. For example, one housing provider had a computer system where most of the resources were installed locally rather than distributed over a network, whereas the other housing provider's resources were remotely distributed via a virtual desktop infrastructure (VDI). The combination of the two systems left the newly-merged organisation struggling with a set-up that needed overly complicated maintenance and came with a high price tag.

Simplicity optimised

With around 1,200 staff, it was important for Platform Housing to find a long-term solution that would address the challenges of combining the two separate IT infrastructures. The organisation had some specific areas that it wanted to address, including flexibility, analytics and total cost of ownership.

The IT set-up inherited by Platform Housing after its merger meant that in order to access their work and applications, users had to first access terminal servers, then navigate an additional screen. What was needed was a simplified IT system that gave employees, whether working in the office, at home or remotely, the ability to access their applications direct from a central location instead of having to open multiple screens to start working.

VDI and remote application solutions are a great way for employees to access what they need to work from any location, but not all VDI and remote access solutions are equal. It's a good idea to shop around and look for one that has simple installation, all-inclusive licensing and easy options for scalability.

Platform Housing solved its challenges by using a remote application delivery solution to optimise its VDI solution, enabling it to reduce its 50+ post-merger servers down to 20. The best remote application delivery solutions work with VDI, Remote Desktop Session Host (RDSH), Azure Virtual Desktop and Remote PC to ensure that users can access all the apps needed for work easily and smoothly, even when working remotely. They can also offer greater flexibility and data security so it's worth doing some research to find a solution that uses multi-device, multi-app workflows and supports multi-cloud deployments, including Microsoft Azure and Amazon Web Services. Some are very adaptable, and some will allow the mixing and matching of different operating systems. For example, applications can be deployed on-premise but then scaled out to hybrid or public cloud, with auto-provisioning and auto-scaling.

Flexibility

Even before we all learned to work remotely in 2020 during the pandemic, it was important for organisations to build flexibility into their IT systems and now, more than ever, it's understood to be a crucial part of enabling business continuity in the face of unexpected global events. Part of this is ensuring that departments using specific applications aren't forced to work from the office just because that's where their specialist software resides.

For example, at Platform Housing the finance and housing management teams use SDS Proval, IPOS, Capita Open housing, Swordfish and DRS as well as Microsoft Office, and users work both in the office and remotely. Both teams, wherever they are working, are unaware that they are accessing their applications and desktops through the server.

This illustrates how, when looking for an all-in-one VDI and remote application delivery solution, it's important

to choose one that allows users to launch and work with their own desktops and applications, which are published virtually to wherever they are and on whatever device they are using from inside an HTML5-enabled web browser; users don't have to install additional software on their PCs or laptops and aren't limited to a particular platform. Additional features such as high-availability load balancing, granular filtering and multi-factor authentication also help ensure optimum security and redundancy.

Central management

Platform Housing wanted simplicity for users and IT administrators to improve efficiency and the user experience. A solution that publishes users' desktops and applications from a central server keeps things simple for managers because all dashboards are in one place, providing clear insights into performance and resource

usage. IT administrators should be able to review and detect patterns or spot any problems, all from a 'single pane of glass'. Users need single sign-on (SSO) so that they only have to log in once to access what they need without re-entering numerous authentication codes.

Making a choice

For organisations like Platform Housing, it's crucial that their chosen VDI solution is flexible and able to be accessed remotely to ensure no interruption to business processes. A remote application solution that optimises the experience of using VDI, Remote Desktop Session Host, Azure Virtual Desktop and Remote PC can be a real asset.

Paul Fisher is a technical consultant at Parallels.

Aico launches new environmental sensors



Aico has launched a new range of IoT-based HomeLink environmental sensors, marking the company's first 'smart home' product beyond its well-established smoke and carbon-monoxide alarms since its acquisition of HomeLink in 2020.

Available in two models, the Ei1020 measures temperature and humidity while the Ei1025 measures temperature, humidity and carbon dioxide; both IoT-based sensors are designed to provide actionable insights into conditions such as mould, draughts, excess cold, heat loss and indoor air quality for both tenants and their housing providers.

Integrating with Aico's SmartLink Gateway, the environmental sensors overcome many challenges, from compliance and carbon footprint to mould risk and fuel poverty. The SmartLink Gateway extracts data from the environmental sensors into a central data repository. Advanced machine-learning technology interprets the data to provide insights via the HomeLink reporting dashboard.

The dashboard provides detailed property and portfolio views and is designed for multiple user roles. With data from the environmental sensors and

connected fire and carbon-monoxide alarm systems segmented by high, medium and low risk, top-level data can be viewed on the main dashboard, while deeper insights can be accessed to tackle problems, maintain compliance and enable preventative strategies.

Chris Jones, chief executive officer, HomeLink said, "Before our acquisition by Aico, we had huge demand for environmental sensors because of the obvious and sizeable compliance and maintenance business case they presented. As Aico's first smart home product beyond smoke and carbon-monoxide alarms, these sensors represent a large milestone.

"Having already connected 65,000 devices in UK social housing, and with several thousand back orders for the new sensors, it's clear that IoT technologies have truly taken hold in our sector."

Modular housing – Production, process & standardisation



Deborah Smyth, Managing Director, Tempohousing



To meet the UK's challenge of delivering two million homes during a time of skills shortages and rising materials' costs, we need to show that technology can help us achieve our goals; adopting a manufacturing approach means embracing the principles of production, process and standardisation.

Standardised components

Often referred to as 'platform design for manufacture and assembly' (PDfMA), this enables multiple versions of a product to be made from standardised components, as demonstrated by car manufacturers. We can use our standardised products as a digital twin replicated on other projects within social housing.

Tempohousing originally set out to design a modular unit to meet all the UK Building Regulations but this was also an opportunity to aim for zero-energy costs and associated carbon emissions. Tackling fuel poverty is a key driver for us and has consequently informed all our 'downstream' decisions. We have adopted the minimum space standards so that comfort and wellbeing aren't

sacrificed, while still meeting the density of land-use demanded by planning departments.

Using a steel frame system, we can achieve fine tolerances, yet it is a robust and versatile material, and resource efficient. It lends itself to manufacturing, with no waste and is recyclable at the end of the life of the building, not leaving an unwanted legacy for future generations.

Building information modelling

Using building information modelling (BIM) as the basis of our design creates a common language between the design team, factory and client. It provides a long-term digital record of the clients' assets, critical to a housing provider's management of its housing stock.

BIM can then link the buildings' specifications to the manufacturing process, with staged and recorded assembly ensuring accuracy, proof and materials' provenance. This ultimately leads to the intended energy performance of the modules, without any dreaded performance gaps. This process also includes a detailed record of the fabric build-up to meet the fire strategy for the dwelling.

With the fabric of the dwelling optimised, we need to choose a heating system that benefits from such a high specification. Energy modelling showed that the heat losses were reduced to the point where hot water was the greater energy demand above space heating, so we

chose a class-leading air-source heat pump, designed for a new generation of super-efficient homes. As the energy mix in the UK shifts to more renewable sources, electric heating is coming to the fore, especially efficient heat pumps, and where locally-generated renewable energy is available.

Renewable sources

The final stage is to choose the renewable energy option. Photovoltaics will provide the energy, though feed-in-tariffs are minimal these days, so we offer a smart-energy trading platform with a communal battery, so excess energy can be traded within the local community.

Zero-carbon homes can be achieved and fuel poverty addressed.

Standardisation is the key to all manufacturing processes so by working to fixed dimensions, with proven and certified products, we can achieve the efficiencies that will meet the government's ambitious 'Future Homes' standard.

Deborah Smyth is the managing director of Tempohousing.



Wakefield District Housing has partnered with Landmark Information for the provision of intelligent location data and advanced mapping services.

By working with Landmark Information, WDH now has access to a wealth of Ordnance Survey MasterMap, Address Point, raster and Land Registry ownership data. The geospatial data underpins the housing provider's web-based mapping service that is accessed by hundreds of users across the organisation.

Fraser Lumb, GIS analyst, Wakefield District Housing, said, "Using high quality, rich data to manage our assets is vital to our ongoing operations. Landmark can take us to another level of data analytics, such as enabling us to cross-reference our stock list with the address database, apply a Unique Property Reference Number (UPRN) for every property and streamline the way we're working.

"We can now immediately see where we own land and view non-developed land, we can drill down to codepoints, polygons or undertake postcode level analysis to conduct deprivation or price-paid assessments, as well as produce data for internal studies looking at arrears or claims analytics, and all within our preferred CadCorp GIS platform.

"For example, with our ground maintenance or tree management contracts, I can confidently map our requirements to ensure we get best value for money from our contractors. It's very powerful."

Digital twins in housing

Housing Technology interviewed executives from CGA Simulation, Chimni, Civica, Gray Fox Consulting, NEC Software Solutions, Simul8 and Twinview about the role of digital twins in housing and how they can be used for better business operations, improve tenant safety and support more rigorous governance and regulatory compliance.

What is a digital twin?

Gray Fox Consulting's CEO, Alistair McLeod, said, "A digital twin is a virtual representation of the elements and dynamics of a physical object. In housing, a digital twin is a complete, real-time digital replica of all your building assets. It provides performance data, specification information and the ability to walk through the buildings using immersive technology, all while sitting at your desk."

Chimni's founder and managing director, Nigel Walley, said, "A digital twin could cover a range of software types including, at its simplest, a digital building logbook that captures and stores information about a building or, at the end other end of the spectrum, a 3D digital model that enables the use and performance of buildings to be recreated and measured. When the underlying model has been created during construction using building information management (BIM) software then there would be a strong emphasis on operational and maintenance information."



The benefits can be as simple as having access to 'as built' property information on a mobile device through to AI to improve operational performance.

Rob Charlton, CEO, Twinview

Civica's product director, Helen Hurley, said, "A digital twin can be anything from a 3D model, such as a virtual representation of a property or an asset, through to populating the twin with data to support performance management, scheduling and monitoring maintenance routines, risk modelling and planning of future investments."

NEC Software Solutions UK's director of housing solutions, Trevor Hampton, said, "A digital twin is a complete representation of a physical building in digital form. The



We use 'found' and 'created' data to build our digital twins; this means we can model situations for which data doesn't yet exist.

Jaine Pickering, Communications & Business Manager, CGA Simulation

technology is still relatively new to the housing sector, but it's an exciting advance that could have a really positive impact on tenants' lives."

What can you do with a digital twin?

Simul8's CTO, Frances Sneddon, said, "Acting as a virtual test lab, a digital twin can run alongside and in constant synchronisation with a live system, thereby offering the prospect of real-time monitoring and improvements in process efficiency."

"The digital twin can be fed with data from across a housing provider's business applications to create an accurate digital replica of its operations and processes. From there, you can run a variety of simulations to test different scenarios, in effect fast-forwarding to see the impact of decisions before they are implemented in the real world."

CGA Simulation's communications and business manager, Jaine Pickering, said, "A digital twin is a way of simulating, mapping and modelling the world around us. We use 'found' and 'created' data to build our digital twins; this means we can model situations for which data doesn't yet exist. We've modelled road networks, autonomous vehicle technology, pollution and even the spread of coronavirus around a town."

"We use agent-based modelling (ABM) for our digital twins. ABM is a form of mathematical modelling that lets us model things, such as people, vehicles, pollution or the placement of IoT devices on a 5G network. ABM assumes that each thing being modelled operates with individual



agency, rather than as a 'hive mind', interacting naturally with the other things being modelled in the digital twin.

"This autonomy enables us to predict what the future might look like and, say, how homes and their surrounding networks might work together. This is useful for people designing the homes and neighbourhoods of the future because they can look at different options for housing design and technologies."

Civica's Rogers said, "Digital twins can help to make big data easier to interpret, analyse and act on. For example, a housing provider's digital twin could augment its asset management strategy by modelling and forecasting various future scenarios or improve building safety through real-time, IoT-based asset monitoring and building information modelling."

Twinview's CEO, Rob Charlton, said, "A digital twin can provide accurate historic and current operational and performance data, which can be invaluable for compliance, communications and environmental controls. The benefits can be as simple as having access to 'as built' property information on a mobile device through to artificial intelligence to improve operational performance."

What are the benefits of digital twins?

NEC's Hampton said, "When overlayed with virtual reality, a digital twin could allow an architect or housing officer to 'walk' around the digital building and outside spaces and refine their designs in advance of construction, avoiding expensive reworks later."

"From a regulatory perspective, new building safety regulations are likely to be applied to most buildings so digital twins could be used to support fire-safety measures, for example, to map the journey of heat, flames and smoke in a simulated emergency situation."

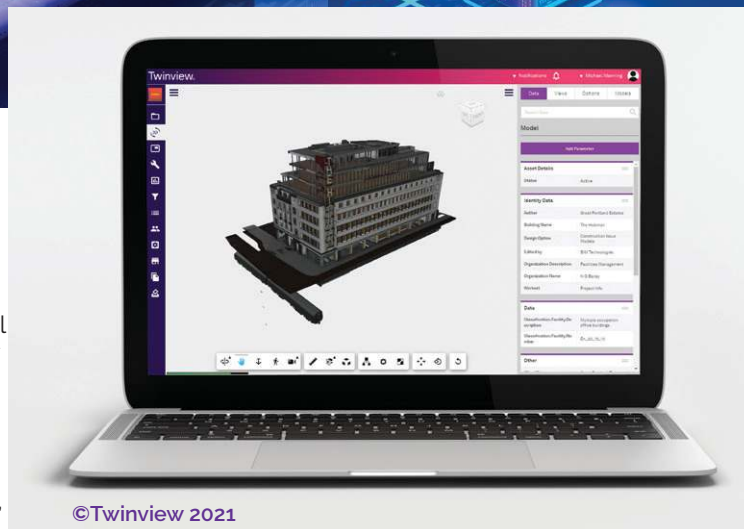


Most of us will start with a 'baby digital twin' in the form of a digital property logbook.

Nigel Walley, founder & managing director, Chimni



CGA Simulation's Pickering said, "The benefits of a digital twin are manifold. A common premise is using one to explore and eliminate issues and pain points via a safe



digital space, before committing resources and money in the real world.

"For example, CGA Simulation has created digital twins of road networks in cities to test the safety of autonomous vehicle technologies and mapped out a hybrid 5G network in a dense city neighbourhood. These projects were both faster and less expensive than trialling the technologies in real life, and safer in context of autonomous vehicles."

Chimni's Walley said, "Beyond planning, design and construction, there is always an emphasis on digital twins' ability to aggregate and report data on operational and maintenance issues. With good data like this, the more intelligent digital twins would support forecasting of maintenance issues and related costs."

Twinview's Charlton said, "The operational benefits include access to building information, communication with tenants and lower running costs. Financially, digital twins can reduce maintenance and energy costs through monitoring and prediction. Overall, a digital twin maintains objective performance and operational data in one environment, providing a single source of truth."

Which housing assets & data types are most suitable?

Gray Fox's McLeod said, "While digital twins can be created across all types of assets, it's not a case of 'one size fits all'; there's a sliding scale of information capture and operational gains. For large, complicated assets, the benefits of detailed asset information supported by 3D visualisation are clear, but it can also be useful for smaller, less complex assets for real-time monitoring of security, heating and cooling."



Given that data is expensive to create and maintain, simple 3D models coupled with asset data is a great way to start with digital twins.

Helen Rogers, product director, Civica

NEC's Hampton said, "The ability to analyse costs against benefits would help housing providers to target their investments where they will have the greatest impact. For example, this might involve using a digital twin to model whether changing access points or upgrading windows and doors in high transit areas of a building would reduce energy costs enough to warrant the disruption and expense. In future, digital modelling in the construction and management of multi-occupancy buildings will become increasingly important for achieving efficiencies and cost savings at scale."

Integration with existing IT platforms & data hierarchies

Civica's Rogers said, "From IoT device data, building information modelling, repairs and ASB through to tenancy data, in order to understand the whole picture of both properties and tenants, digital twins need to integrate with housing, asset and contractor management systems and reporting solutions to enable successful data management and effective outcomes."

Chimni's Walley said, "Depending on the nature of the reporting and forecasting capabilities within a digital twin, we envisage them eventually being incorporated into building maintenance and fault reporting systems, finance systems and customer management tools. However, a digital twin needs to be designed with these roles in mind from the outset."

Gray Fox's McLeod said, "Digital twins should be considered as an extension to the information you already capture. After all, most housing providers already have rudimentary digital twins in some form, based on the information in their housing management systems, even if they're not formally referred to as a digital twin."

NEC's Hampton said, "A seamless link between a digital twin and a housing management system would capture a wealth of data that can be used to improve services. With details such as the number of people a building can accommodate, how many bedrooms or bathrooms there are and whether windows are double- or triple-glazed at their fingertips, housing providers could spend less time gathering this information manually and more time meeting tenants' needs."

"As buildings are updated or occupancy levels change, integration between systems allows for a live data feed to be used to understand what impact these changes might have on factors such as fire safety measures and energy use."

Minimum requirements

Chimni's Walley said, "At the very minimum, a digital twin needs to be software that is configured such that it mimics the physical asset it's meant to represent. At its simplest, this could be a system that stores information in file structures representing the rooms, layouts and major volumes of any building; for example, the simplest 'digital property logbooks' offer this functionality."

CGA Simulation's Pickering said, "Not all digital twins are the same; you can create a digital twin in 2D or 3D online, potentially with mixed and/or virtual reality. Regardless of the complexity of what you're trying to do, your data is key because without data you have no scope for a digital twin."



BIM provides information about the asset; digital twins provide data about how that asset performs.

Alistair McLeod, CEO, Gray Fox Consulting

"For example, CGA's digital twins are underpinned by AI, so for the AI to work the algorithms must be fed as much relevant data as possible. They are self-generating and learn from the data they are fed, in terms of building the digital twin picture."

"To create a really meaningful digital twin, you also need access to external environmental data from organisations such as the ONS, Ordnance Survey, local authorities and other housing providers if you're modelling IoT around housing; you need to know what's where and why as accurately as possible."



A digital twin is a complete representation of a physical building in digital form.

Trevor Hampton, director, housing solutions, NEC Software Solutions UK

"Finally, for a digital twin that is presented beautifully and realistically, you need somebody to design the assets and environments for you on an engine like Unity. In our case, we use our gaming experience to create photorealistic backdrops for our digital twins."

Gray Fox's McLeod said, "There are no minimum requirements; the more data you capture about your assets, the better your digital representation will be. Start with the data you already have and build up a coherent data set, driven by what you want to measure and how



Digital twins aren't about creating complicated replicas of an entire organisation, but about zooming in on individual processes to find ways to improve them.

Frances Sneddon, CTO, Simul8

you want to improve your business operations and services to your tenants."

Twinview's Charlton said, "Digital twins work for both new and existing buildings. A model isn't strictly necessary, but it does help with the data visualisation. Overall, for a twin to work properly, there needs to be a data connection between your assets and the platform of your digital twin.

"With an existing building, data builds over time; a simple 3D model can be produced and information added over time. With new buildings, the initial information is more detailed, with the priority being keeping that information up to date."

BIM and digital twins

NEC's Hampton said, "Using BIM, a digital replica of a physical entity can be manipulated and measurements of the available space can be taken with relative accuracy, but the scope for interaction with the space beyond that is limited.

"Enhancing this with a digital twin means an avatar could 'walk' through the virtual space, change lighting levels in a stairwell or check elevators are easily accessible and it would behave in a similar way to the physical building."

CGA Simulation's Pickering said, "A digital twin sitting alongside BIM software could be really useful because the twin could be a way of collating and capturing any BIM knowledge and presenting it in a dynamic and interactive way. However, the quality of the digital twin is critical because it would need to demonstrate something beyond what was already available via the BIM software."

Gray Fox's McLeod said, "BIM is a key data source for any twin, but BIM alone can't answer the operational questions facility managers might have about optimising their operations. BIM provides information about the asset; digital twins provide data about how that asset performs and how it needs to be maintained."

'Baby' digital twins

Chimni's Walley said, "We're not sure that scalability has been built into the early concepts for digital twins in housing, but the idea that the underlying data model should get more extensive, cleverer and offer richer functionality over time is compelling.

"It's likely that most of us will start with a 'baby digital twin' in the form of a digital property logbook, and it's also likely that housing providers and local authorities will head towards 'digital tweens', with simple, lo-fi models of the surrounding areas. These would be considered 'babies' in terms of their capabilities, even though their geographic remit would be quite large."

Civica's Rogers said, "Given that data is expensive to create and maintain, some simple 3D models coupled with meaningful asset data is a great way for housing providers to start with digital twins. You can then build out from there once the return on investment has been understood and proven."

Simul8's Sneddon said, "It's a myth that digital twins are only the preserve of large companies, requiring huge investments in IT to produce complex, futuristic models of their operations. In fact, digital twin technology has now been democratised to the point where just about any organisation can tap into their benefits.

"Digital twins aren't about creating large, complicated replicas of an entire organisation, but about zooming in on individual processes to find ways to streamline and improve them or to plan ahead to deal with any possible contingency."

Housing Technology would like to thank Jaine Pickering (CGA Simulation), Nigel Walley (Chimni), Helen Roger (Civica), Alistair McLeod (Gray Fox Consulting), Trevor Hampton (NEC Software Solutions), Frances Sneddon (Simul8) and Rob Charlton (Twinview) for their comments and editorial contributions to this article.



Remotely monitoring & protecting connected communities

Andy Greenhorn, Regional Sales Manager, FireAngel

The concept of digital twins and using data to create a virtual representation of a physical object has been part of FireAngel's innovations since 2007 when the IoT landscape began to take shape.

With housing providers facing growing pressure to improve fire safety for residents and maintain a 'golden thread' of asset information, meeting these challenges within current budget parameters can feel like an overwhelming prospect.

However, similar to how digital twins operate, connected technology such as the internet of things (IoT) and artificial intelligence (AI) can be used to virtually represent and report in real-time on a fire safety network of mains- and battery-powered alarms installed across a property.

By ensuring a constant channel of communications from physical devices to a digital dashboard, it creates a secure audit trail of data, thereby complying with the Hackitt report's 'golden thread' recommendation.

Installing connected fire safety technology empowers housing providers to take advantage of centralised, off-site monitoring and enables multiple devices and properties to be managed from a single place.

Proactive over reactive maintenance

Connected smoke, heat and carbon-monoxide alarms that are powered by the IoT are monitored around the clock to keep landlords informed on the complete status of alarms in a property. Any devices that have been tampered with, removed or need urgent attention will be highlighted, helping property owners proactively plan for future maintenance investments.

Silent testing or organised audible testing can be performed remotely across a network at individual property levels on a daily, weekly or monthly basis to make sure all devices are in working order. This ensures every alarm in every property is tested every time and doesn't rely on waiting for a member of the maintenance team to gain access for an annual test.

By processing, sorting and structuring data in real-time, the residents most at risk of a fire in individual properties are automatically pinpointed, allowing housing providers to support with active interventions.

Harnessing the capabilities of connected technology and the IoT enables housing providers to eliminate wasteful maintenance visits, saving staff time and in turn reducing administrative costs. The technology can also integrate with other asset management systems to enable automated maintenance scheduling and streamlining workloads for busy teams.

Real-time environmental monitoring

One major challenge many housing providers are facing is the onset of damp and mould in properties, with around 60,000 complaints received by local authorities across the UK relating to mould, damp or condensation between 2012 and 2018.

Unobtrusive connected temperature and humidity sensors create a holistic view of the environment inside a property. Devices can capture humidity and temperature data and provide real-time information for housing providers to actively review and spot any environments where mould or damp could easily develop. They can then deliver tailored advice to tenants and provide accurate information about where they need to adopt better ventilation and heating practices or refer them to fuel poverty support groups if they need further help.



Smart sensors can also provide a clear audit trail, recording accurate and regular environmental readings specific to each property and room – again helping to comply with the Hackitt report's golden thread. And because the data can be analysed remotely, there's less need for intrusive on-site investigations.

Detecting risk hidden behind closed doors

In the year ending March 2021, the UK Fire & Rescue Service attended more than 27,000 dwelling fire incidents, with 26 per cent of these fires occurring in purpose-built buildings. However, with only one in four fires known to the Fire & Rescue Service, the actual number of incidents is thought to be much higher.

When connected technology is paired with AI, it uses real-time insights to fuel proactive interventions and provide a higher level of fire prevention through the analysis of trends and patterns of data.

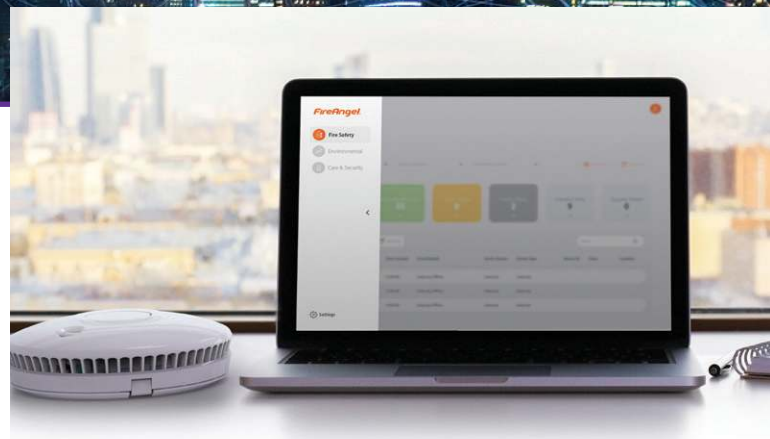
Developed with support from the UK Fire and Rescue Service, FireAngel Predict runs a unique algorithm with a patented application that spots trends of behaviours logged by smoke and heat alarms, creating a map of fire-safety triggers and categorising properties according to risk.

Tried, tested and trusted after 10 years' development, FireAngel Predict gives visibility of previously hidden trends within social housing properties, such as alarms activating through the night or devices being removed.

Automatically highlighting these potentially dangerous behaviours to housing providers enables active interventions to mitigate risk with a personalised 'safe and well' check by the resident safety team or the fire service to help prevent a life-threatening event.

Grow a connected community

Connected technology, digital twins and the data collected from IoT sensors will continue to play a growing role in the future of fire safety in our communities. By analysing data for trends and patterns, housing providers



can identify properties that are particularly prone to damp or pinpoint residents who are most at risk of a fire.

However, all this requires the right technology. With FireAngel Connected, housing providers and tenants can monitor and mitigate fire risks throughout their properties. With the automated capabilities of FireAngel Predict built in, FireAngel Connected helps to create the reliable, accurate insight housing providers need to protect their tenants, while maintaining a manageable and secure audit trail of data for each property.

The FireAngel Gateway can be connected to enhance a network via cellular or ethernet to remotely monitor smoke, heat and carbon-monoxide alarms, with built-in temperature and humidity sensors identifying environments which may lead to the onset of damp and mould in a property.

To find out how FireAngel's extensive range of connected fire safety solutions can suit your housing portfolio or to discover more about FireAngel Predict, get in touch with our team of specialists by visiting fireangel.co.uk/connected.

Andy Greenhorn is a regional sales manager at FireAngel.



Digital twin or digital cousin?



Camilla Shrieve, Data Consultant, Data Futurists

A digital twin is a virtual model of a physical object. It comprises an interconnected system of sensors and data analysis methods using aspects of artificial intelligence to learn about the systems it is monitoring and predict when issues may arise based on the experience it has seen.

The impact on an organisation of having a fully-functional digital twin could be vast: knowing what's going to happen before it happens; having exact confidence in where an action needs to take place; replacing equipment before it breaks down; and analysing the performance of different component models. All of these things can give housing providers insights that will save them money, improve customer services and provide better homes for their tenants.

Getting an application with this much impact up and running isn't as easy as installing a new piece of software. The integrated nature of the digital twin needs to be carefully considered, not just with the physical location of sensors and how they interface the data but also with how that data is interpreted within business processes. You would also need to consider what data you are feeding into the system, how reliable that data is and how frequently it's updated. The last thing you want is to rely on a system that is using incorrect information and therefore giving you poor quality actions. Just like with a new development where the buildings need strong foundations, a digital twin is reliant on the quality of your housing and asset data.

How many storeys?

For example, consider an eight-storey building and the light goes out on the stairwell on the top floor. Your property database may have this (incorrectly) recorded as a seven-storey building (surprisingly likely because the numbering of the storeys starts at ground, first... seventh).

The digital twin reports the issue and a ticket is raised to replace the lightbulb on the eighth storey. The person who picks up the ticket may review the location and reject the ticket, saying that there must be something wrong with the new system because the property database says that there are only seven storeys. The lightbulb therefore remains broken and the confidence the user has in the digital twin is reduced. The customers then have to manually report the broken light and the benefit of the digital twin is lost.

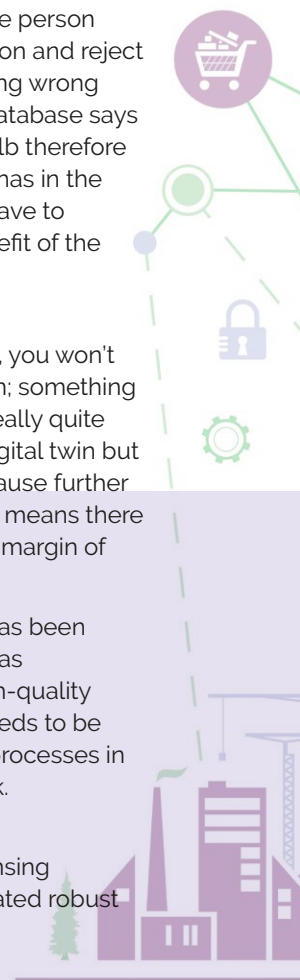
Meet your digital cousin

If your data is incomplete or has inaccuracies, you won't have a digital twin but more of a digital cousin; something that acts and looks similar but in practice is really quite different. You would still be able to use the digital twin but the output wouldn't be accurate and might cause further issues. This isn't an irreconcilable issue; it just means there is more work to be done and there is a larger margin of error until the data has been cleansed.

Data cleansing is often a daunting task that has been attempted before, but over time the quality has deteriorated again. Unfortunately, having high-quality data is not a 'one and done' task. The data needs to be maintained and managed but with the right processes in place this doesn't need to be an onerous task.

Data lifecycles

To really make the most out of any data cleansing activities, you need to ensure that you've created robust



lifecycle processes for your data, from initial collection through maintaining the data and into the end of its life.

Implementing effective data controls and clear processes around the changes to data will ensure that the quality of your data and your confidence in it will be maintained because all changes that are needed will be actioned appropriately and in a timely fashion. This is the point where you can go over your existing data and ensure that it's correct, making changes to the data where errors are located and following the data-change protocols that had been designed and implemented previously.

Qualitative & quantitative reporting

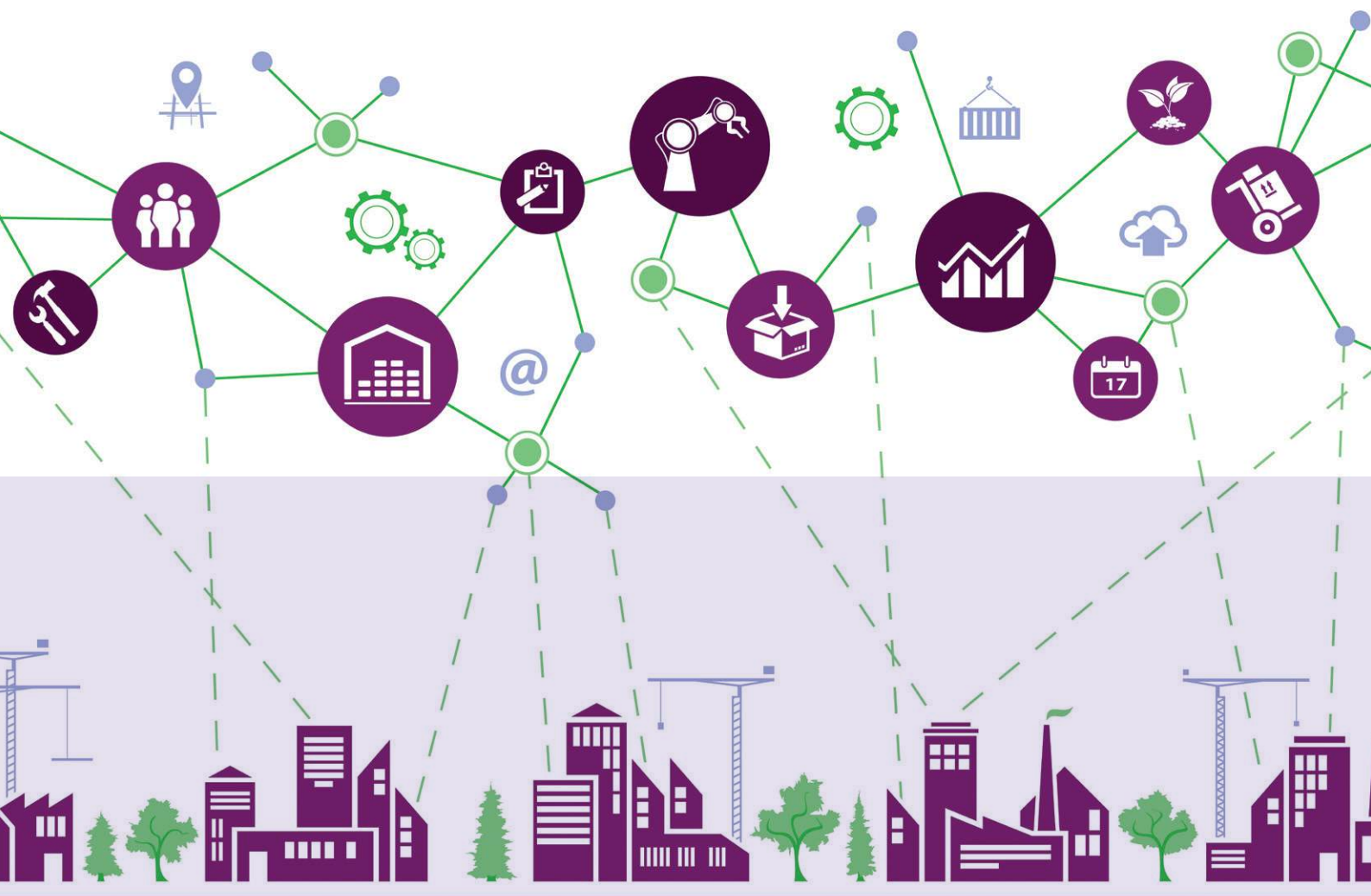
Once the data has been cleansed, then it needs to be monitored and maintained through effective and timely reporting; this should be a combination of quantitative and qualitative reporting to ensure the data is complete

as well as valid and accurate. Where data is reported, it's important to consider who it's reported to; in this context, your data improvement programme needs to establish data governance roles adapted to the needs of particular roles.

Improving your data quality will have significant impact all over the business and improve the effectiveness of any new technologies.

Quite simply, you will stop looking after lots of people born on 01/01/1900, inspecting phantom components and have true confidence in your compliance position. You can then be confident that your digital twin is actually a twin, not a distant cousin.

Camilla Shrieve is a data consultant at Data Futurists.





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Speculative design – The wider implications of AI in housing

Dr Laura Benton & Professor Mina Vasalou, UCL Knowledge Lab

This article is based on work from the CHAI academic research project, which explores how individuals can best recognise and protect themselves against potential security risks posed by AI-enabled smart technologies in the home. It is a three-year EPSRC-funded project involving five UK universities in collaboration with Housing Technology.

Benefits vs. risks of AI technologies

AI-enabled smart technologies, such as voice assistants, smart locks and smart thermostats, are becoming more common in our homes because they can make many aspects of our domestic lives easier. There has been increasing interest in introducing these technologies within the social housing sector given the opportunities they offer housing providers to increase efficiencies and improve safety across their properties at the same time as providing benefits to tenants such as savings on energy bills.

However, these technologies also come with new risks, both known and unknown, and there's currently limited regulation around many of these smart devices. Of particular concern is the fact that they can make us more vulnerable to cybercriminals looking to cause harm through stealing our data or seizing control of the devices.

Given our limited experience using and living with these smart technologies, it can be difficult for individuals to imagine and assess what these risks would be, and to then make a decision about whether the benefits outweigh the risks in their particular context. For example, a smart device enabling an elderly person to continue living independently in their own home could be seen as a greater benefit than simply having the convenience of being able to switch on your heating on your way home from work.

Wider societal implications

Emerging technologies, such as AI-enabled smart technologies designed for home use, can introduce a range of social, political and technical implications that have the potential to affect people and wider society in significant, extensive and often unpredictable ways.

To understand these complex issues within our research, we use 'speculative design'. A speculative design approach asks "what if..." questions to raise critical issues about the design and use of technology in the future. Speculative design therefore helps us as technology designers to recognise the implications of our decisions in advance and to develop technologies that will increase the chance of a more desirable future.

The questions posed during speculative design can be explored by not only the design team, but also through involving future users of the technology in creative design workshops. In particular, speculative design methods seek to understand participants' experiences, needs and worries. During the workshops, a tangible prototype is often presented to help participants imagine what the future involving this new technology might be like and to prompt them to think through the various issues in a critical way.

This prototype can be in the form of, for example, technology props/models, stories/videos/comics



3D-printed props used in CHAI speculative design workshops

illustrating use of the technology, advertising campaigns, device packaging or social media posts/product reviews about the technology.

In CHAI, we use physical 3D-printed props of existing smart technologies. Our participants are given the creative task of 'configuring' this technology using stickers with relevant real and imagined functionality and placing it within their home. Following a week's engagement with the props, we carry out a reflective discussion in small groups of three or four tenants. We discuss specific experiences as they relate to the benefits and risks they anticipated while they had the technology prop in their homes.

Including diverse voices

Academic research exploring the societal implications of smart home technologies has typically involved younger users who are also digitally literate. Young people's views and concerns are important to understand, but this group is only partly representative of social housing tenants.

With an increasingly ageing population, residents of social housing have tended to be older compared to the private-rented sector. Looking beyond the issue of age as a single factor, there's also a recognition that technology can affect people in different ways based on an interplay of factors such as age, gender, disability/health status or family circumstances.

For example, consider the hacking of smart technology that detects residents' activity to regulate heating; the consequences will be experienced differently if the resident has young children compared to a resident living alone with a disability.

At CHAI, we are recruiting people from a variety of backgrounds (older people, parents, retirees and people at work). Following our participants' week-long engagement with the technology props, we carry out a reflective discussion in small groups. During these discussions, our facilitators prompt participants to reflect on the benefits and risks discussed in relation to their life characteristics in order to capture the interplay of factors.

The University College London team is actively looking for research partnerships with tenants, housing associations and technology providers. To learn more about our research plans and to get involved, please get in touch with us via L.benton@ucl.ac.uk.

Dr Laura Benton & Professor Mina Vasalou are from the UCL Knowledge Lab.

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- **Keynote** – Andrew Grill, The Actionable Futurist: To get digital, you need to be digital
- **Aareon:** The seven golden threads of housing excellence (topic tbc)
- **Active Housing:** Customer self-service and digital channel shift (topic tbc)
- **Aico:** AI and IoT-based knowledge & insights (topic tbc)
- **BPHA:** Digital & cultural transformation despite a pandemic
- **CHP:** Rise and shine – Digital transformation & corporate restructuring
- **FireAngel:** Get connected – Fire safety monitoring, analysis & reporting (topic tbc)
- **Halton Housing:** What's next... Proptech, digital twins & BIM
- **Housing Solutions:** From private datacentre to fully AWS environment
- **Link Group:** Link's group-wide 'innovation challenge'
- **MHA:** MHA's digital journey (incl. dogs, giant tablets, clouds, music & apps)
- **NEC Software Solutions:** NEC Housing – Super-light code & heavyweight experience
- **Newport City Homes:** "We've an app for that" – NCH's powerful new 'HMS in your hand' for tenants
- **Optivo:** Scrum programme & roadmap for housing & asset management
- **Orbit Group:** Embracing the digital customer experience (topic tbc)
- **Places for People:** The IT squad – IT teams that deliver value
- **Project CHAI (UCL & Univ. of Reading):** Can you handle AI?
- **Raven Housing Trust:** How to face and conquer the challenges of transformation
- **Redkite CRM:** 'Out of the box' Microsoft Dynamics CRM for housing (topic tbc)
- **Rooftop Housing:** Business strategy for a digital world – Best-in-class digital transformation
- **Royal Borough of Kensington & Chelsea:** From TMO to in-house services & technologies – Our experiences and lessons learned
- **Scottish Federation of Housing Associations:** Digital maturity in Scottish housing
- **South Lakes Housing:** Business transformation – Data management, tenant communications & intelligent infrastructure

- **Swan Housing:** Cyber security in housing – Our front-line experience
- **Techlabs London:** Microsoft Dynamics 365 & Azure in housing (topic tbc)
- **TSG:** Laying strong foundations for a bright future (topic tbc)
- **Vivid Homes:** 'U can't touch this' – Automating the risk and effort from compliance
- **Wrekin Housing:** Overcoming 'cloud scepticism', hybrid working and cyber security
- **Yorkshire Housing:** The future of work & technology as an enabler for post-pandemic change

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Digitisation – What's holding you back?

Simon Evans, CTO, Amido

Addressing digital lag

Business and IT strategies within the housing sector tend to be born more from efficiency and growth than from the drive for innovation and investment that we see in other sectors. With a lack of inherent competition, this presents a challenge – a 'digital lag' – that leaves the housing sector playing catch-up in meeting ever-growing digital expectations. It also presents a huge opportunity to drive meaningful change and the chance to tackle environmental and customer-facing problems on a level playing field.

To scale business processes and make them more efficient, operational processes are becoming more automated, with individuals (both staff and tenants) having to adapt to this change. As we move towards a future where adaptability and situational awareness are key, digital transformation will require employees who can resolve complexity, upskill to meet advances in technology, and adapt to new models of working.

For housing providers, digital transformation should sit under a framework of a strategic plan that mirrors key housing challenges including climate change, collaboration, responding to human needs, creating resilient solutions, and delivering incremental value.

Shifting towards a zero-carbon future

Although we are seeing high levels of investment in the creation of carbon-neutral homes, it's likely that ambitions will need to stretch further to carbon-negative solutions that, over the next ten years, will start to pay back some of the carbon debt that has been amassed over the last 150 years. The buzzword is 'retrofit', and it's here that innovation and technology are needed to negate the high costs of retrofitting to 2050 standards.

Pilot schemes such as housing upgrades in Nottingham and Maldon using the Energiesprong system are being

observed with interest. Like any good technical strategy, these initiatives are linked to the housing provider's business strategy, with income received via the fee for performance paid by the tenant, as well as the expected maintenance and cost savings over the next 30 years, covering the cost of the work.

With the 2050 target of net zero emissions being one of the major challenges facing housing providers, individual businesses have looked to address the problem by not only sharing the cost but also by delivering high, ongoing value across the sector. In April 2021, five of the UK's largest housing providers (Abri, Anchor, Hanover, Home, Hyde and Sanctuary) formed the Greener Futures Partnership to improve the energy efficiency of their combined 300,000 homes and, together, develop decarbonisation solutions for the social housing sector.



More significantly, GFP has started with a bold but potentially sector-redefining goal. Each housing provider in the group will benefit from the financial, technological and energy efficiency gains that collaboration brings. This signals the group's commitment to "join forces and resources as a sector to support the UK's shift towards a zero-carbon future, to help the environment and improve the lives of millions of people."

This is where the opportunity for the housing sector lies: through more meaningful collaboration, complex problems can be tackled efficiently. With the benefits of shared knowledge and pooled experience, the housing sector can prepare for the increasingly challenging problems the future is bound to deliver.

Responding to people's needs through technology

In addition to looking at the technological efficiency gains that collaboration brings, businesses should consider how new technologies can focus on people's real needs, to deliver value and make improvements to the lives of both tenants and staff. The adoption of technology can play a major part in providing tenants with a voice, in making them feel safe, in reporting on landlord performance and spending, in managing complaints, and in helping landlords keep homes in good repair.

A recent survey saw respondents from across the housing sector overwhelmingly choose 'asset management and property repairs' as the area that would most positively benefit from investment in technology and innovation. Delivering solutions for self-service repairs gives tenants flexibility and choice, and the simplest of solutions to the most thorough integration can provide savings and benefits for the housing provider.

In a volatile world, it is more important than ever to deliver little and often against a multi-year plan. Where changes to the economy could have a direct impact on tenants' ability to pay rent, alongside increased costs and lower availability of materials and resources, the housing sector needs to be delivering in this way; iterative benefits and focusing on agile delivery are probably more important now than they have ever been.

In housing, there can be no short-term focus; metrics are yearly and investments tend to match that. This creates a significant challenge when it comes to funding non-essential projects and initiatives. It is impossible to have clarity on budgets year-on-year and waterfall planning for any project isn't realistic.

Successful businesses will be those that are agile enough to work in shifting climates, but the potential overall cost and timeline should always be front of mind, and flexibility should be built into any digital transformation strategy.

Simon Evans is the chief technology officer at Amido.



Aico's Royal visit

Aico was honoured to receive Her Royal Highness Princess Anne at its headquarters in early October in recognition of its impact as a prominent business in Shropshire.

Her Royal Highness The Princess Royal arrived at Aico's headquarters in Oswestry, Shropshire and was met by Aico's managing director Neal Hooper, alongside Mandy Thorn, deputy lieutenant of Shropshire, Vince Hunt, chairman of Shropshire Council, Owen Paterson, MP for North Shropshire, Mark Jones, Mayor of Oswestry, and Ruth Jones, Mayoress of Oswestry.

Her Royal Highness was given a tour of Aico's facilities, providing Her Royal Highness with an insight into the company's history, its innovations in home life safety and its award-winning CSR programme. At the end of the visit, Her Royal Highness was presented with a horse headcollar adorned with an Aico monogram.



Neal Hooper, managing director, Aico, said, "Aico is committed to achieving the highest quality in all that we do and this is evident in our passionate staff, continued innovation, exceptional service and unrivalled support.

"Our philosophy has provided a foundation for growth, constantly driving forwards and seeking new ways of doing things. To receive this recognition from Her Royal Highness is nothing short of an absolute honour; we are privileged to have been able to share Aico's ethos with The Princess Royal."



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