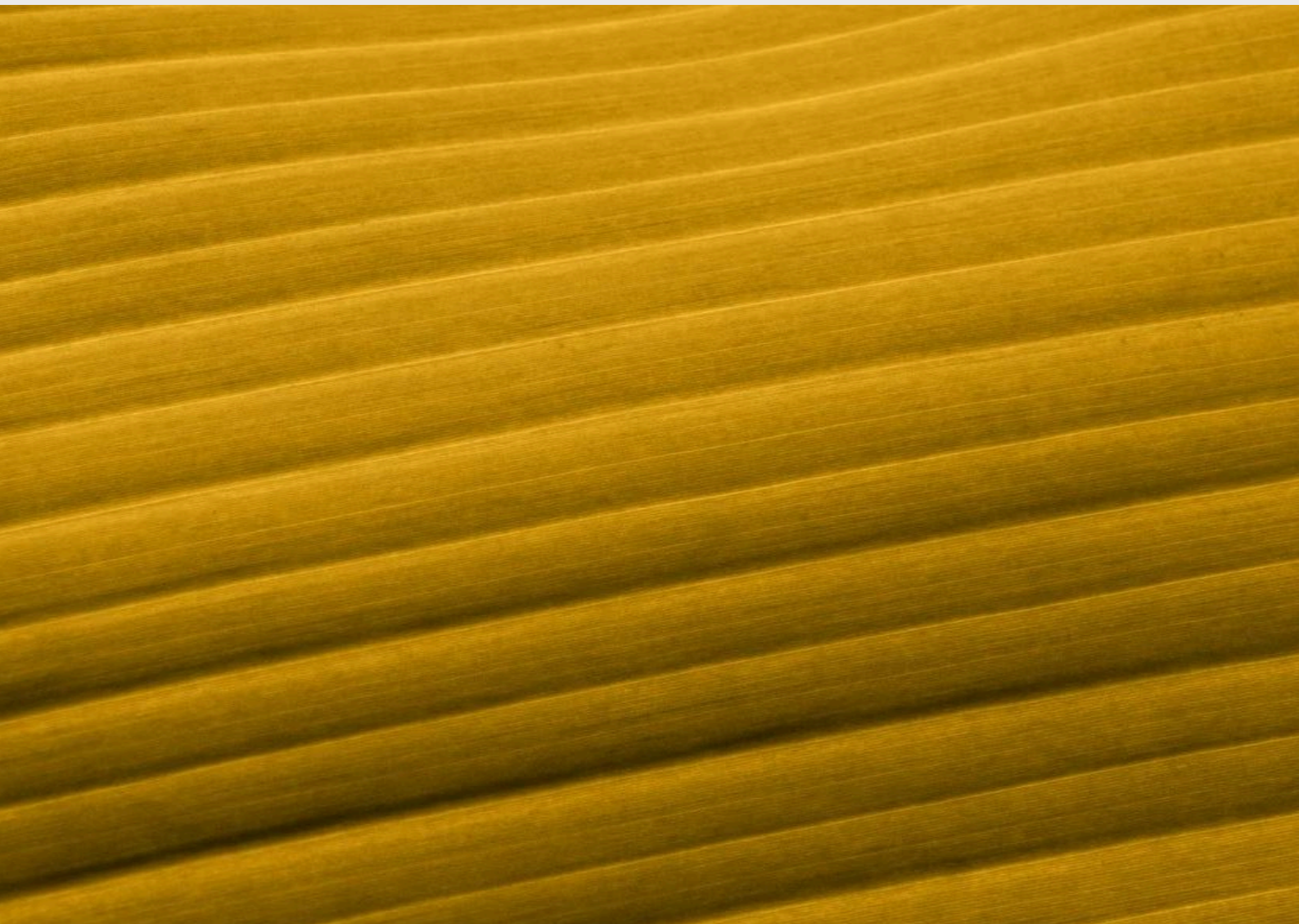


KOMODO

AN INSIGHT INTO AUGMENTED REALITY

An insight into Augmented Reality and
how it is driving transformation.

— WHITE PAPER
AUGMENTED REALITY



WHAT'S IN THIS WHITEPAPER

CONTENTS

WHY LISTEN TO US?	03
-------------------	----

USER EXPERIENCE WITHIN AR	04
---------------------------	----

RAPID PROTOTYPING IN AUGMENTED REALITY	07
--	----

AR USE WITHIN SOCIAL HOUSING	09
------------------------------	----

AR USE WITHIN MANUFACTURING	12
-----------------------------	----

IMPROVING SELF-SERVICE REPAIRS WITH AR	13
--	----

GET IN TOUCH	16
--------------	----

Estimated reading time: 20 mins

01 — ABOUT US

WHY LISTEN TO US?

We help teams transform technology with cutting-edge AR applications.

Since 2003, KOMODO has been an innovator. Far from throwing out empty words, we've always prided ourselves on showcasing real innovation in the tech industry – embracing new ideas that were at first branded 'trends'.

In the first iteration of this whitepaper, we talked about AR as it would shape the future. In 2022, we now know that AR is becoming commonplace, with over one billion mobile AR devices in use around the globe. It's just one aspect of a wider push towards greater user interaction with technology – new ways to access product and business information in a virtual world.

AR itself was developed in 1968 but struggled to gain widespread appeal until the advent of smartphones. Now that everyone has a powerful personal computer and camera in their palm, companies have begun to realise its potential. The first commercial application came in Germany in 2008, displaying a BMW Mini when a user pointed their camera at a print advert.

Since then, AR has been used across every industry – from marketing and advertising to gaming. Just consider the success of Niantic's Pokémon Go.

At KOMODO, we're a creative studio that loves being at the forefront of innovation – but we've never followed a trend. Instead, we use AR like any other technology: as the result of a dedicated research project that seeks to understand what your users need and what technologies can help fulfil those needs. In plain English, we never build AR into a project unless there's a tangible reason we can prove through user research.

Your business may already recognise a need for AR, or we'll uncover it in research – but we'll never simply 'prescribe' it. We'll work with you to understand what your business does and what your users need, then create solutions to match. Everything starts with a conversation, so if you're looking to launch or improve a product, let's chat.



KOMODO digital studio.

02 — USER EXPERIENCE

USER EXPERIENCE WITHIN AR

AR is expected to become a driving, innovative force in the future of our industry. It offers people new ways to interact with data and the environment around them, presenting fresh creative opportunities for UX designers to explore.

The concept is not new – the first instances appeared in fighter craft in the 1990s, then called a ‘helmet-mounted display’. AR shouldn’t be confused with Virtual Reality, which generates a completely virtual environment and excludes the real world.

Augmented reality is the integration and overlaying of digital content into a user’s real-world environment, in real time.

THE DEFINITION — AUGMENTED REALITY

AR found its way into mainstream use with Pokémon Go, released in July 2016 and quickly surpassing 100 million downloads. Revenue reached \$268 million in 2017.

To date in 2022 the app has generated \$1.92 billion. With a proven capability to generate revenue and enhance workflows, AR is set to transform many industries.



AR headset hardware (e.g. HoloLens).

AR Hardware

Hardware remains a significant challenge, with Google first to market in 2013 with its Glass headset. Despite huge interest, Google shelved the project just a couple of years after launch – a combination of poor marketing, a high price point, no clear use cases and privacy issues.

It later relaunched Glass with an ‘Enterprise Edition’ aimed at business, which looks more successful. In 2016 Microsoft launched the HoloLens: a fully functional PC in an untethered headset with a visor display. Microsoft is enjoying more success – the price is high, but a coherent business strategy has driven better adoption. Other players – Magic Leap, Epson, Vuzix, Meta and Garmin – all have solid products. When a maker like Apple can build an AR headset that looks like a stylish pair of prescription glasses, AR will become mainstream.

Sector Applications

When AR is mentioned, Pokémon Go or Snapchat may spring to mind first – but it isn’t just for entertainment. According to Lumus, the sector could achieve sales of \$11.6b by 2025.

Healthcare, manufacturing, education, retail and marketing are all areas where AR can create an impact; healthcare revenue alone could top \$5.1b, with engineering just beneath at \$4.7b. By giving workers real-time information exactly when they need it – and removing the need to reach for a computer on the job – AR promises to make work safer and faster.

Its immediacy makes it a breakthrough for healthcare: AccuVein projects over the skin to help locate veins accurately on the first try.



Photo by Solen Feyissa

02 — USER EXPERIENCE

User Experience in Augmented Reality

Removing the constraint of a screen is game-changing, but AR presents challenges – chiefly the absence of a common set of interaction standards, due to the sheer scale and variety of applications.

AR allows any surface to become a display. Snapchat leverages this to drive engagement, letting users drop 3D models onto real-world surfaces as part of a recorded clip. It may be a gimmick, but it's a playful example. Snapchat boasted 191 million daily users in Q1 2018, and by 2022 that was estimated as high as 293 million. TikTok announced AR-ready creator tools in April 2022.

UX designers must be prepared for this rapidly growing technology – understanding a new design paradigm is crucial to delivering great experiences.

Key Considerations

There are many factors to consider when designing for AR. Designers must account for external and environmental factors – like where the app will be used – especially when the technology interacts directly with the environment.

How will it work in different lighting? A manufacturing worker on a HoloLens interacts very differently from a health worker on a tablet, and hardware influences design decisions. All cases benefit from uncluttered interfaces: a clean, navigable screen keeps the user immersed and limits distractions, while displaying only relevant information signposts interaction.

Keeping gestures familiar – as Ikea Place and Snapchat do – minimises the adjustment period. AR will be a paradigm shift that UX professionals must navigate and establish practices for.



AR experience running on an iPad.

03 — PROTOTYPING

RAPID PROTOTYPING IN AUGMENTED REALITY

As a product studio, we've performed many R&D projects to test our abilities and nail down a confident workflow for designing AR applications.

The use of augmented reality apps has steadily increased over recent years, with manufacturing companies implementing the technology within their organisations and an ever-growing catalogue of consumer apps driving interest in augmented, virtual and mixed reality.

Whilst performing our research, we've discovered a few tools that have greatly sped up the design process and allowed us to rapidly prototype the UIs we're creating – quickly iterating concepts in 3D before moving to higher-fidelity programs.

Smartphone capabilities continue to improve, granting AR capabilities to millions of users. The introduction of software solutions such as Apple's ARKit means it's now easier than ever to push an augmented reality application out to a market that can use it.

£94.4bn

the value the global augmented reality and virtual reality market is forecast to reach by 2023, according to P&S Market Research.

03 — PROTOTYPING

Torch Application

A newer addition to the app store is 'Torch', an AR app led by CEO Paul Reynolds and Josh Faust, who previously led Magic Leap's SDK and applications efforts. Torch lets you explore a range of features, including placing flat images and 3D models in 3D space. The most impressive thing is its performance – running on an iPhone 6s gave the Apple A9 chip no issues, though older models may struggle. After days of building small prototypes, we never experienced a crash.

The main draw for prototyping is the ability to create a basic UI flow within the app, by creating several 'scenes' and linking them together with tap interactions. Within each scene you can place UI elements – currently static images, with video and GIFs coming – and every element can be enhanced with an interaction.

The only downside is the inability to create hotspots to click through: a scene change is triggered by tapping anywhere on the placed image. This limits complexity, but even a simple interactive AR prototype is very valuable for user testing and presentation.

Another benefit is the app's integration with Dropbox and Google Drive – no more exporting and transferring images manually. It also imports Sketchfab and Poly 3D models, opening more doors; initial tests with preloaded 3D objects were very impressive. These tools let us test ideas and run small user tests in 3D, quickly iterating before moving to higher-fidelity programs. When this guide was first created AR was still emerging – now it's a global mainstay present in almost every smartphone.

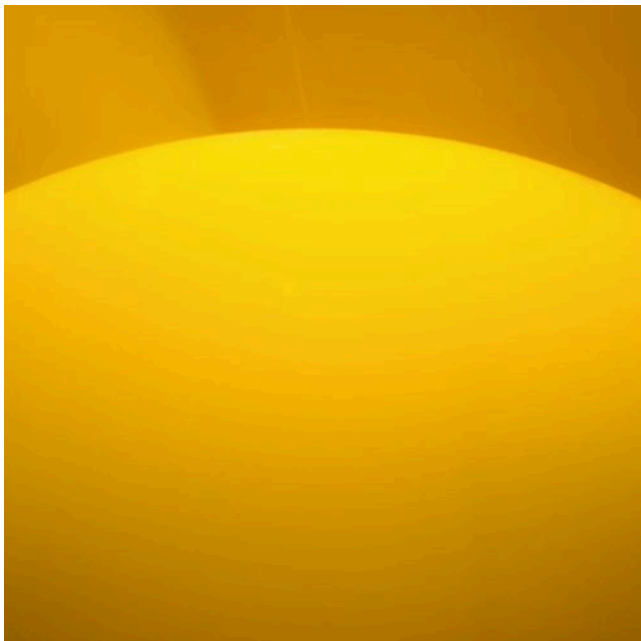


Photo by Engin Akyurt

04 — SOCIAL HOUSING

AUGMENTED REALITY USE WITHIN SOCIAL HOUSING

The social housing sector is undergoing rapid digitisation, transforming how services are delivered to residents. The idea of a 'digital tenant' is quickly becoming a reality.

The Government is driving digital adoption – 80% of Universal Credit applications must now be made online – and housing associations are setting up schemes to bring the internet to communities.

The initial stage of any project always begins on our 'Thinking Wall' – large whiteboards where we sketch, collaborate and quickly iterate without becoming too attached to any one idea.

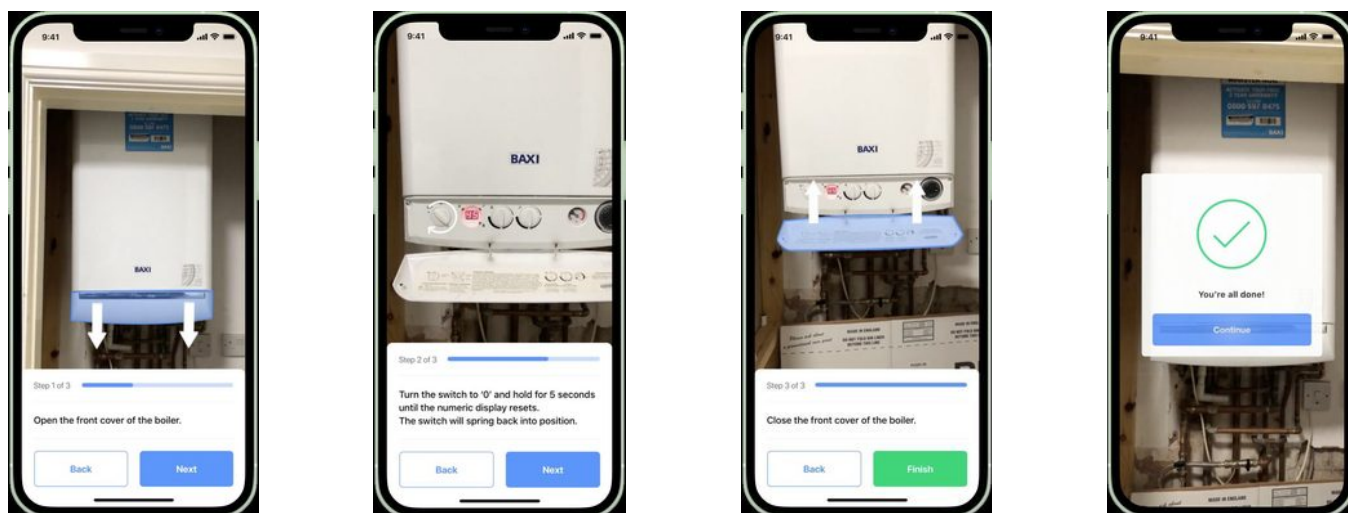
THOMAS WOOD — KOMODO DIGITAL

According to Mondaq, on average 69% of digital access is now carried out via smartphone, and that share keeps growing. In tenant requests given to Geomant, repairs were by far the highest category.

The report forecasts that by 2025 the housing environment will be very different and highly competitive – organisations will need responsive services while operating more efficiently. Technology will be at the forefront of that transformation.

04 — SOCIAL HOUSING

The Visualisation of Information



AR in the home / business (e.g. Boiler Repairs).

There's a real push to develop and adopt new ideas that create a more streamlined experience for housing associations and their tenants. The 'Vision of Housing in 2025' reports, published by 3C Consultants, highlight key comments from participants – including smart-tech devices and self-service repairs.

“The majority of routine transactions with residents will be carried out via smart-tech devices. Hopefully we'll be fully digitised by then – so everything will be different, from the care of older residents, to repairing homes, to self-service by customers.”

AR can benefit a sector with a keen eye on affordability and efficiency, and is becoming more accessible than other disruptive technologies.

“Despite the buzz around virtual reality, augmented reality is where the money is. VR units sit around 82 million, but with AR tech in most smartphones, AR units peak at over three billion – a recipe for innovation and disruption across several sectors.” – Evening Standard

“The future of AR is open now that the big guns have unveiled their platforms – Apple's ARKit, Google's ARCore and Snapchat's Lens Studio – allowing developers to create their own AR apps and features.” – Evening Standard

Many companies are already innovating: Ikea Place lets you position furniture virtually in your room, and Specsavers lets you scan your face to try on glasses before buying.

04 — SOCIAL HOUSING

Using AR to Simplify Repairs & Maintenance

Gaia Dempsey, a pioneer at DAQRI, explains that three decades of research in manufacturing, aerospace and surgery show AR training and task guidance significantly reduces errors, speeds up learning and accelerates task completion.

Social housing relies enormously on affordability and efficiency, especially in repairs and maintenance. AR is quickly becoming a standard innovation – reducing human error, execution time and cost while increasing productivity.

See-what-I-see remote collaboration is the new preferred way to have specialised expertise on-site anytime, anywhere – decreasing downtime and saving time and money.

WIKITUDE

Through continuous R&D, we're working on a proof of concept that would let tenants book repairs and troubleshoot issues via instructional AR tutorials in an app. Maintenance workers could use the app, or a wearable version, to aid repairs or provide remote assistance.

Users could scan a sticker or code to bring up troubleshooting options, and the object's history would be saved – so another worker can see past work and internal parts without consulting a logbook. Real-time 3D annotations help teams solve problems efficiently, with no extra relocation costs.

05 — MANUFACTURING

AUGMENTED REALITY USE WITHIN MANUFACTURING

Augmented Reality within manufacturing can radically improve production processes and overall efficiency, and is increasingly finding its stride as companies implement it in the maintenance of their equipment.

Where maintenance involves field workers reliant on manuals, AR provides greater efficiency and better on-the-ground insight. Applied to servicing, it grants the ability to triage requests ahead of a call and enables hands-free, remote guidance on site. When ThyssenKrupp began using Microsoft's HoloLens, initial trials showed they reduced the average service-call length by four times.



Fig. — HoloLens on a service call.

By adopting the HoloLens they eliminated the need for a laptop, keeping technicians' hands free. Before attending a site, they can view a 3D model of the elevator in question, zoom into individual components, and access technical information and training.

All of this is assisted by Skype, integrated into the HoloLens, allowing remote calls to subject-matter experts with a live stream to a laptop. The expert can provide a second opinion and advise on corrections. As of 2016, ThyssenKrupp planned to roll the platform out to over 24,000 technicians.

06 — SELF-SERVICE REPAIRS

IMPROVING SELF-SERVICE REPAIRS WITH AR

We've been experimenting with how AR could align with one of the sectors we focus on – social housing.

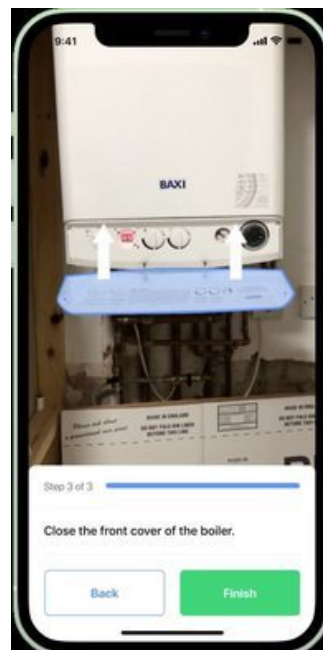
We chose to embark on a design sprint to generate a proof-of-concept AR app with real-world impact. From our experience in social housing, we've gained extensive insight into areas with potential for improvement.

The project began with an idea-generation session, considering how we could improve social housing for both tenants and providers. We identified a key area: repairs. Many social housing companies still use third-party tools for logging and requesting repairs – and we saw an opportunity to improve that service with an AR application.

Current Call-out Process

Often, engineers attend call-outs for issues that are trivial and could be fixed by tenants themselves, if they had the instructions and know-how. Even reporting a repair can be laborious, with the user filling out numerous fields just to identify the appliance.

Our solution is an AR app that helps identify the appliance and issue. The user scans an identifying code placed on every major appliance, and the app pulls up product information, common issues and troubleshooting tips. If the issue is something they can fix, the app walks them through it step by step – while still letting them request a professional repair – and highlights the components to adjust with 2D/3D UI.



Scanning an appliance code in-app.

06 — SELF-SERVICE REPAIRS

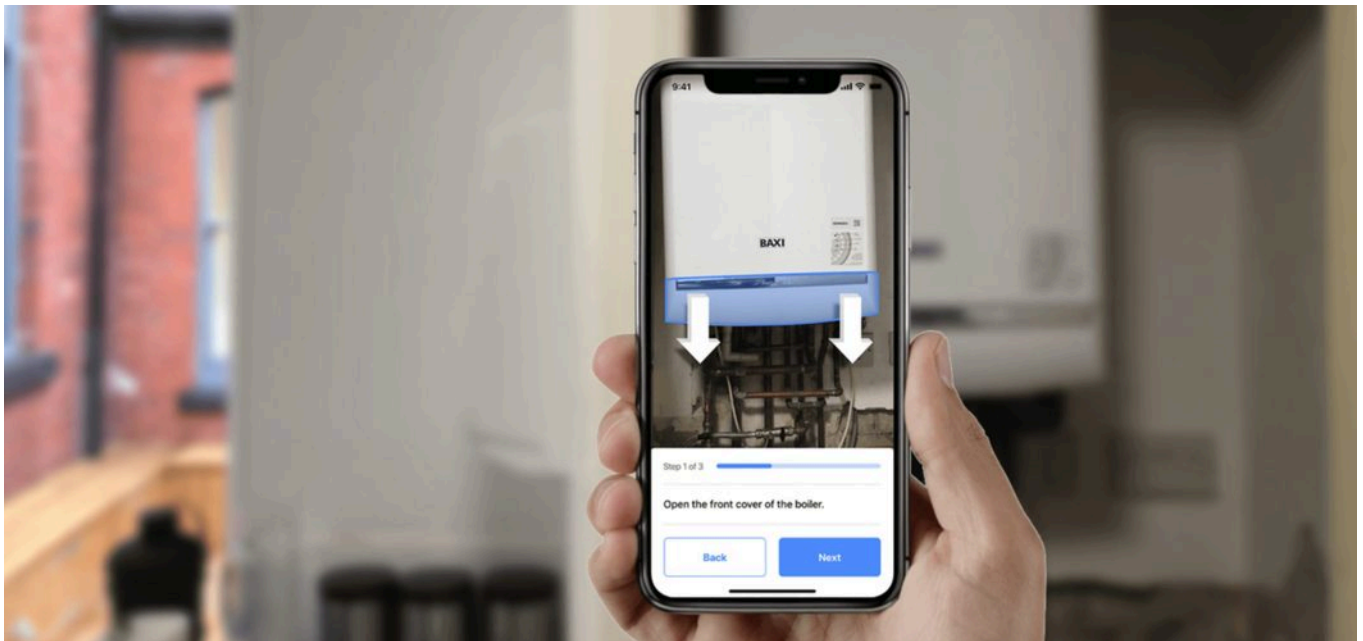
Using Torch to Rapidly Prototype Our Designs

The Torch app gave us a platform to quickly iterate and test our UI. Once we had some initial UI designs, we were able to view these elements within a 3D space to assess key issues such as the legibility of text.

Through this iterative process, we identified flaws in our initial UI and made changes accordingly. After several iterations we were confident the final UI was strong enough to take forward into a more polished proof of concept.

To visualise our final concept, we shot a video that followed the flow we'd mapped out and took it into After Effects to add the UI elements we'd created. Using 3D tracking, we placed the exported UI into the video and pinned it in place, giving us a glimpse of how the 2D and 3D elements work from different perspectives. We demonstrated how the app could walk a user through resetting their boiler – something that solves many problems and is simple to do.

Going forward, we plan to explore how emerging technology can provide solutions across the social housing, insurance and law enforcement sectors.



Compositing the final concept in After Effects.

IN CLOSING

Our projects follow a process we've built over time to offer maximum return on investment – and a faster, more intuitive release experience for your end-users.

01

UNDERSTAND

Do your users need AR, or will they benefit from it? Who are they, and how do they use technology? We understand them before assigning any solution.

02

DEFINE

Once we know your users, their needs and digital behaviours, we can define the project – including what level of AR integration is needed, and how long it will take.

03

IDEATE

Our creative team suggests exciting ways to introduce the technology, from AR camera filters to deep, AI-driven interaction.

04

CREATE

With a scope outlined and ideas generated, our sprint-based creative process delivers results within an agreed timeframe.

05

REFLECT

The launch is never the end. We reflect on the project and continue to iterate and update where needed.

IN CLOSING

CREATING FUTURE-FOCUSED TECHNOLOGY TO SOLVE YOUR PROBLEMS

As you've read, we have real passion for exploring and working with the latest technologies – but we never build anything 'just because'. Everything follows our defined process to ensure commercial success. We use our three core traits – understanding, creativity and intelligence – to understand your users, create engaging products, and implement intelligent execution that saves you time and money.

GET IN TOUCH