Repairs Online: Technical alpha

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UNBOXED

CITY OF Lincoln COUNCIL

SOUTH KESTEVEN DISTRICT COUNCIL

ROYAL borough of GREENWICH

Southwark Council

Ministry of Housing, Communities & Local Government

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Problem to solve

Problem statement

Councils are responsible for repairs to socially rented properties. Most residents access the service by phone and it is typically the council service with the highest call volumes.

The estimated national cost of repairs call handling is over £30m per annum.

New repairs only make up around half of all calls, implying significant failure demand.

Barriers to Adoption

- lack of trust in digital services
- preference to explain issues to agent
- tenants chasing progress of existing requests
- confusion of responsibility for repairs
- urgent / dangerous repairs not suited to digital channel
- Additionally, the demographics of tenants are the same as those most likely to be digitally excluded

Part of a bigger problem

Repairs are the most complicated service offered by social landlords.

Some councils outsource certain types of housing repairs whilst others outsource all repairs work.

Councils categorise and apply codes to repairs once they have been reported, so they can track and monitor the cost of repairs work. However, the way repairs are ‘coded’ varies from council to council.

Photo by matthew Feeney on Unsplash

Multiple systems are also involved.

To fit in with most existing council processes, new digital services would need to integrate with:

- The council's housing management system - effectively a database of council property and tenant data. Most councils have configured these systems to meet their own specific requirements.
- The council's asset management system - this is where some councils store data about which properties have asbestos, which is useful information for repairs operatives.
- Scheduling systems - To identity available appointments with repairs operatives. Although two suppliers of scheduling systems dominate the social housing market, the suppliers of some housing management systems also provide a 'scheduling' module.
- Contractor / Workforce management systems - To manage internal repairs teams and/or contractors and associated costs.
- Mobile working systems - so that repairs operatives have access to the data they need, whilst on-site.

Where councils outsource repairs work, there would also need to be integration with contractors' systems for scheduling jobs and mobile working.

Some contractors use similar systems to what councils use but others have developed their own software.

This presents additional complexity as new digital services that are seamless and efficient for residents would not only need to integrate with the council's systems but also the systems used by contractors...

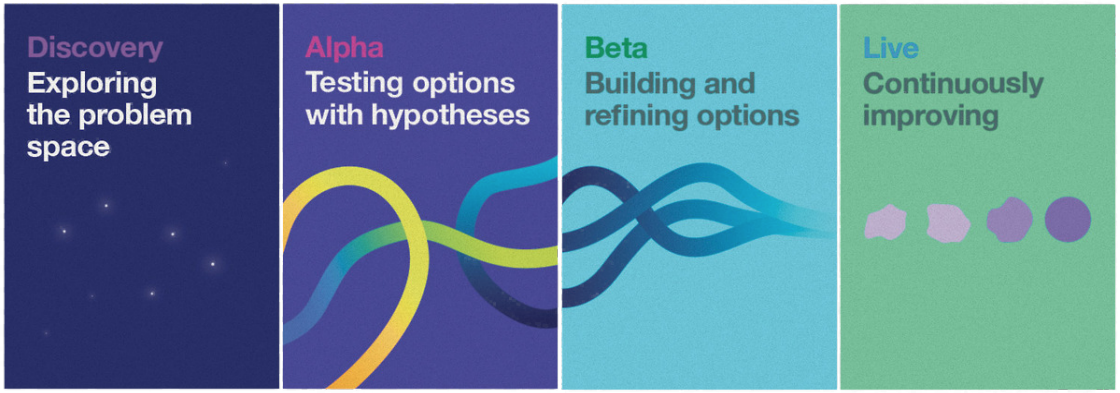
...unless councils are willing to change their existing processes.

Our approach

Aligned with the GDS Service Standard

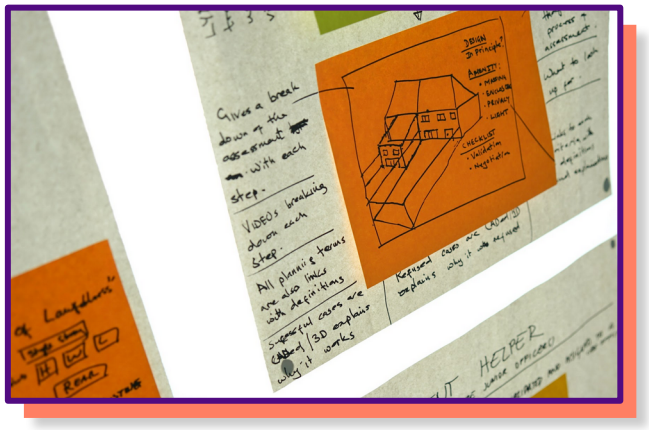
Our approach is aligned with the GDS Service Standard and the Local Digital Declaration, of which City of Lincoln, South Kesteven and Royal Borough of Greenwich councils are signatories. Southwark Council is a co-publisher.

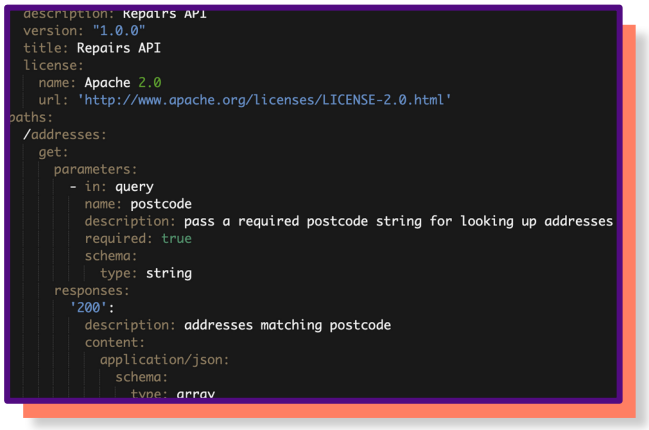
Following discovery and alpha phases, this technical alpha was commissioned to understand the feasibility of implementing a common service pattern.



Alpha activity themes

The team have been exploring three activity themes across the technical alpha, consisting of:





Research and analysis

- Mapping current service provision
- Understanding current processes
- Mapping council ‘digital’ landscape: what in-house digital capability exists?
- Identifying opportunities to add value

Prototype iteration

- Extending the earlier alpha prototype to include more diagnosis ‘drilldowns’ and communal repairs
- Identifying opportunities for further user testing and research e.g how to change or cancel an appointment

Technical exploration

- Reviewing source code of Hackney Council’s ‘Report a Repair’ system
- Defining common API
- Engagement with suppliers of online repairs services, housing management systems, and scheduling systems.

Technical alpha team

The core team structure of this technical alpha was:

- Product Owner
  City of Lincoln Council
- Senior User Researcher
  Unboxed
- Senior Developer
  Unboxed
- Technical Lead
  Unboxed
- Senior Delivery Manager
  Unboxed

Working openly

Throughout alpha, the team has been collaborating and openly sharing progress with partners and wider audiences, through:

- Blogging - sharing weekly team progress updates via the project website
- Show & Tells — fortnightly sessions to update partners and stakeholders. These sessions were recorded, uploaded to Youtube and shared with interested parties.
- Engaging with existing system suppliers in the housing repairs space
- Engaging with a range of councils - to understand the broader landscape, beyond the four partner councils

Research and insights

Our research

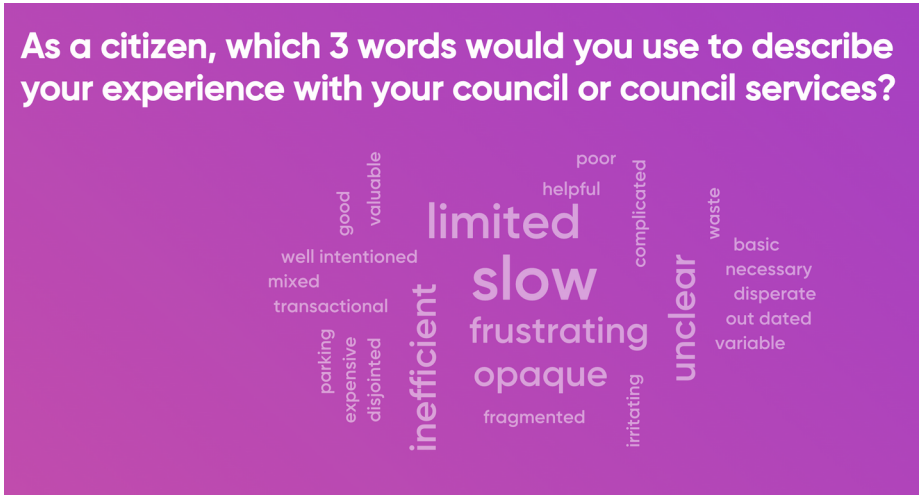
During this project we engaged with:

- 3 housing management system (HMS) suppliers: Northgate, Civica, Orchard.
  - We also contacted Capita and Aeron but did not receive a response.
- 2 suppliers of scheduling systems: (that aren't also suppliers of housing management systems): Kirona DRS, Total Mobile
- 5 suppliers of other digital products: Active Housing, VerseOne, PlaceCube, Plentific, Housemark
- 11 other councils: non-partners, via a council survey and follow-up discussions
- 3 council IT teams: South Kesteven, Southwark, Greenwich
- 1 housing association
- 2 contractors: Smith & Byford, OCO
- Hackney Council's digital team: developers who have been working on Hackney Council's 'Repairs Hub'

TechUK event

On 1 October 2020, in partnership with TechUK, we held a workshop with suppliers of digital services that were currently or want to start working with councils to help shape digital housing services.

- 13 participants were already working with councils, 2 wanted to
- The project was generally well received and insight is consistent with those outlined elsewhere in this report
- Some participants wondered whether the project was missing an opportunity to rethink repairs in the context of COVID e.g more guided self-help content.



Screenshots taken from interactive polls with participants in the workshop.

Further research and testing

As this was a technical alpha our research focus was not with end-users as this was covered in the previous alpha. However, we have identified four key areas that will require further user research and testing:

- Diagnosis journey - the original prototypes, which were tested with 8 users, included ‘drilldowns’ for two types of repairs. Further user testing of the content, for reporting other types of repairs, will be needed.
- Contracted repairs - all of the councils we spoke with use repairs contractors. If it is not possible to integrate an online service with the systems that external contractors use, at least at the beginning, an alternative solution will need to be prototyped and tested with users. For example, the content a resident sees if they diagnose a repair that is handled by an external contractor and they are unable to book an appointment with them online.
- Notifications and reminders - a high volume of calls are from residents enquiring about an existing repair problem. Research is needed to understand what these enquiries are about so we can understand what kinds of notifications and functionality may be required. For example, what do residents need to do to change or cancel appointments?
- Communal repairs - our iterated prototype includes a journey for reporting communal repairs. This needs to be tested with users.

Council survey

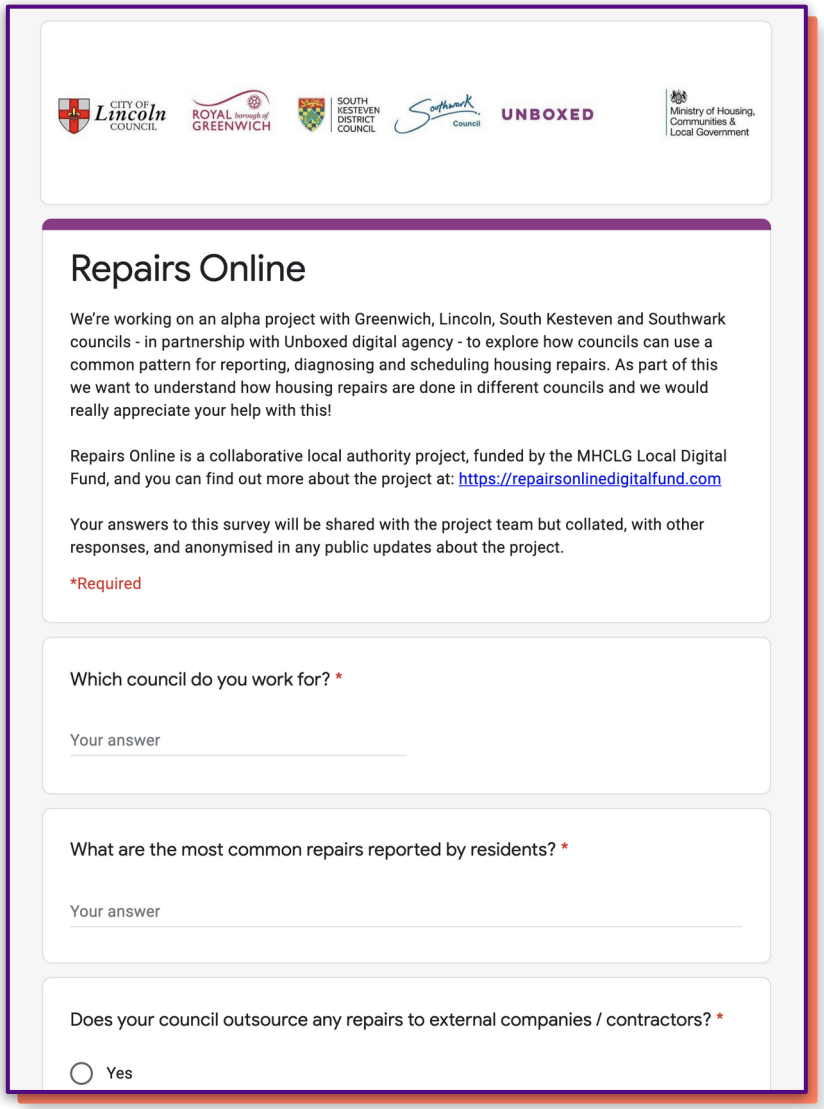
Council survey

The aim of the survey was to understand how council housing repairs services are alike and how they differ.

For instance, we asked councils about the different ways repairs are categorised, the systems they use, and which types of repairs they outsource.

13 councils responded to the survey, 11 of which were outside of the four councils that were partners on the project.

We sent follow-up questions to all of the survey respondents to find out more about how residents can report repairs now, and the level of in-house digital expertise available at those councils.



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Repairs Online

We're working on an alpha project with Greenwich, Lincoln, South Kesteven and Southwark councils - in partnership with Unboxed digital agency - to explore how councils can use a common pattern for reporting, diagnosing and scheduling housing repairs. As part of this we want to understand how housing repairs are done in different councils and we would really appreciate your help with this!

Repairs Online is a collaborative local authority project, funded by the MHCLG Local Digital Fund, and you can find out more about the project at: https://repairsonlinedigitalfund.com

Your answers to this survey will be shared with the project team but collated, with other responses, and anonymised in any public updates about the project.

*Required

Which council do you work for? *

Your answer

What are the most common repairs reported by residents? *

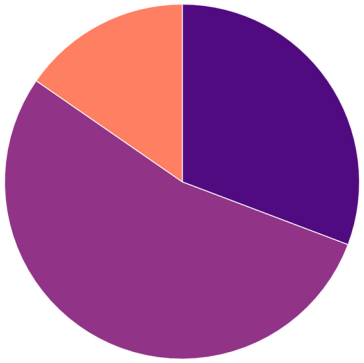
Your answer

Does your council outsource any repairs to external companies / contractors? *

Yes

Council survey findings

SoR codes



How do you identify which trade and time is required for a repair? (13 responses)

- National Housing Federation (NHF) Schedule of Rates (SoR) codes: 30.8%
- A mixture of SoR codes and local additions: 53.8%
- Other / unknown: 15.4%

If you use the National Housing Federation SoRs, have you expanded on them in any way? Please provide detail (leave blank if not applicable) (4 responses):

- We have adapted them so that they include some other works that are not included in NATFED [NHF schedule of rates] such as dayworks for use when no SOR is suitable
- We have added in "simplified" codes so that we can just log eg a Plumbing repair and add the SOR codes later. We have also rationalised repairs to remove some / amalgamate others
- We have added our own codes for fixed priced S/M/L kitchens and bathrooms.
- Planning to implement NHF [SoR codes] later this year

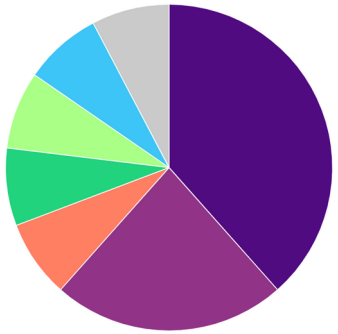
Council survey findings: Outsourced repairs

100% of respondents said they outsource repairs to external contractors.

We asked respondents which repairs are outsourced. These are their answers (12 responses):

- Working at height - roofing, over 2 storey guttering, Gas Servicing. Other work carried out by contractors but not 100% of the time: Clean and clear voids, Drainage work, Out of management voids, Aids and Adapts, Door entry repairs
- All repairs are externally tendered. the inhouse DLO bids and currently manages 40%
- Roofing, Glazing, Drainage
- Gas and in the future probably more. We are currently onboarding new contractors
- All
- Lifts and some other specialist mechanical/engineering
- Large repairs to flooring, plastering, joinery, painting, clearing, Electrical, Plumbing, Ground works, masonry, scaffolding, skip hire, aerials
- All repairs are outsourced to our procured contractors
- All our maintenance repairs are outsourced to Axis Europe
- Engineering works, some void works
- Communal below ground drainage, major external repairs, some voids and legal disrepair
- Non-communal works
- Lifts, Gas, Door Entry, Asbestos, TV aerials
- All Repairs, except Communal repairs which are undertaken by the DLO; Outsources to 3 main providers in the borough

Council survey findings: Systems



Which supplier provides your council's housing management system? (13 responses)

- Northgate: 42.9%
- Capita: 21.4%
- Orchard: 7.1%
- FixFlo: 7.1%
- Aareon: 7.1%
- Civica: 7.1%
- MIS: 7.1%

Which system do you use for scheduling repairs? Leave blank if you don't know. (12 responses)

- DRS
- Kirona DRS alongside Capita Open Housing and Total Mobile
- NPS
- Currently using SVS but due to move over the Accuserve within the next month.
- DRS (Kirona One Advanced)
- our contractor have their own software
- Service Connect
- Universal Housing
- Our own bespoke CRM which sits in front of Universal Housing
- Connect (Total Mobile)

Current service provision

Most common scenarios

SERVICE PROVISION

Diagnosis over the phone

Residents have to call or email the council to report a repair. A customer service agent will ask a series of questions to diagnose the repair, and if they are able to check the availability of repairs operatives, an appointment will be offered.

In some cases this takes place afterwards - in one partner council the repairs contractor calls the resident back to book an appointment but they also ask further diagnosis questions.

PAIN-POINTS

Residents:

- Difficult to diagnose, may have to repeat themselves
- Difficult to get through on the phone (particularly after the weekend)
- Can't report repairs 'out of ours'

Council:

- Difficult for customer service agents to diagnose as they're not repairs specialists
- Overwhelmed by calls, can't prioritise urgent repairs
- Expensive to run the service

Online diagnosis without appointments

Residents can access some repairs content online and can report repairs problems via a web form, but they have to wait for someone to call them back to book an appointment.

These web forms may have minimal functionality, be inaccessible and/or pose a data risk, due to a lack of in-house design and development expertise or due to the limitations of available technology.

Residents:

- Unable to book an appointment online, have to chase up the council

Councils:

- Uptake of the digital tool can be limited due to the inability to book appointments, reducing cost savings
- Call volumes remain high as residents chase the council for updates
- Council staff still have to call the resident back so the service remains expensive.

Online diagnosis with appointments

Residents can report repairs and book appointments online but they have to sign up to the council's portal to access the service. This functionality is often provided as an add-on module to larger legacy systems e.g housing management systems.

These systems have been developed to meet the needs of their suppliers customers, which are councils rather than residents.

Residents:

- Having to register or log in to use the service can be a barrier, particularly if reporting on someone else's behalf.
- There's a lack of research into the experience residents have when using these services as they are often not user tested by suppliers.

Councils:

- Councils cannot easily iterate or switch parts of their system - i.e based on user feedback - without incurring expensive consultancy fees.

Where do partner councils fit?

Partner councils

Other councils we have engaged with during the project

SERVICE PROVISION

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Key insights

Insights from research

We conducted technical research by speaking with suppliers of housing management systems, scheduling systems, and other digital repairs products i.e online diagnosis tools.

We combined what we heard from suppliers with the findings from the council survey, conversations with council IT teams, and interviews with external repairs contractors, to identify five key insights:

- SoR codes hinder the user experience
- Online repair booking may not improve the overall service
- The combination of systems used to manage repairs carry significant technical debt
- Systems and processes have been built around the needs of councils, not residents
- Councils have put housing management systems at the centre of their repairs processes but they don’t need to be.

RESEARCH INSIGHT #1:

SoR codes can hinder the user experience

Councils categorise repairs under different codes, commonly Schedule of Rates (SoR) codes. These are typically applied to repairs jobs to cost them.

- Generating a specific SoR code relies on in-depth diagnosis by residents. An online service that asks residents to diagnose repairs in detail makes the service harder to use and increases the risk of error. It also differs from the experience that private homeowners have.
- SoR codes are not needed to schedule an appointment. Most scheduling systems rely on templates to translate codes into the data that is required to find an appropriate appointment: typically the trade and whether the job is small, medium or large.
- The wrong SoR code is often applied by customer service agents, who are not repairs experts, when diagnosis happens over the phone. The correct code is often applied after the operative has been on-site.
- Not all councils use the same codes. Some use the National Housing Federation's Schedule of Rates to pinpoint the type of repair required and associated cost (trade, time, materials), while others use 'composite' codes i.e a generic code for plumbing. Some councils have also developed their own codes or use a mixture SoRs and composite codes.

RESEARCH INSIGHT #2:

Online repair booking may not improve the service

Around half of calls received by some councils are tenants chasing updates on existing repairs. Providing a new system that allows residents to book appointments online does not necessarily solve this problem.

- A lack of transparency between actors in the repairs system - largely driven by restrictions on who can access data in different systems - can make it difficult to track a repair from initial diagnosis to the point at which it has been resolved.
- Once a repair has been diagnosed and an appointment has been booked, users need a way to track the progress of these repairs. This is particularly true for communal repairs where multiple residents may have reported the issue.
- Preventing ‘chasing calls’ could save councils as much money as moving reporting and diagnosis online.
- We believe that providing notifications to residents, about upcoming appointments and when a repair status changes, could help to reduce calls. However, functionality to change or cancel appointments will also likely be needed to keep call volumes low.

RESEARCH INSIGHT #3:

The combination of systems used to manage repairs carry significant technical debt

Delivering repairs services requires a combination of systems including housing and contractor management systems, schedulers and mobile working.

- Data about tenants is typically stored in the council's housing management system. This includes 'cautionary flags' which, for example, communicates whether a resident is vulnerable. It may also flag that repairs operatives must visit in pairs or a female operative should not attend alone. Some contractors maintain duplicate records of these details.
- Asbestos data can also be stored in different systems. For example, in some councils this data can be found in an asset management system but, again, some contractors also keep their own records of this.
- The web of integrations between these systems are typically complex, have been built up over time and may not be fully understood by support staff. Implementing changes or services on top of these systems is consequently difficult and expensive.

RESEARCH INSIGHT #4:

Systems and processes have been built around the needs of councils, not residents

Digital repairs services, that integrate with council systems, already exist. However, they meet the needs of councils rather than end users.

- One supplier was aware that forcing residents to register to use their repairs service harmed usability, but councils typically ask for this implementation of their product. Some councils believe that putting services behind a log-in screen will incentivise residents to sign up to their online portal.
- Several of the councils we spoke to believe user verification is required to prevent people from logging fake repairs online. However, there is no evidence of fake repairs from councils that provide digital services and don't authenticate their users. It would also be possible for fake repairs to be logged over the phone, but this is not currently a problem.
- Existing digital products for reporting and diagnosing repairs provide admin features that enable councils to customise them to meet their own needs.
- The service pattern can be implemented in some existing products, but councils need to ask suppliers for this, which means prioritising user needs over their own needs.

RESEARCH INSIGHT #5:

Councils have put housing management systems at the centre of their repairs processes but they don't need to be

Repairs jobs start in a council's housing management system (HMS) where a new 'works order' has to be raised and a job number is generated. Other systems that are crucial to providing a repairs service, such as scheduling systems, have been configured around linear process.

- Repairs are raised in the HMS to meet the needs of councils: the need to be able to monitor the cost of each social housing unit. However, it is not essential to the resident's user journey and increases complexity by putting an additional system between the resident and their ultimate goal - to get an appointment.
- HMS are not essential to repairs diagnosis and appointment booking: One social housing provider reported that their customer service team had asked if they could use the online diagnosis tool provided for residents instead of their HMS (when residents call), as it was easier to diagnose repairs there.

RESEARCH INSIGHT #5:

Continued...

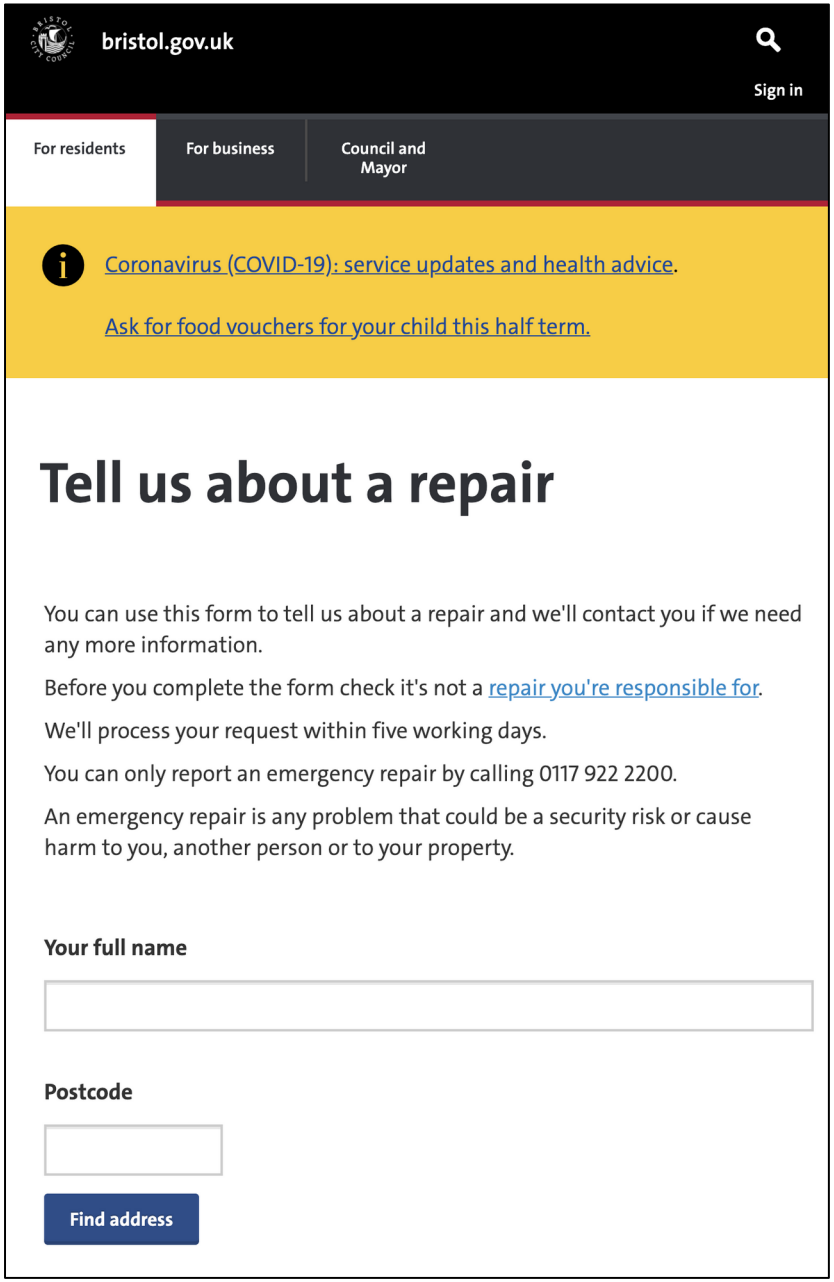
- Only location data is required to check eligibility to use a digital repairs service. This is currently stored in the HMS but could easily be taken from another database containing a list of council property addresses.
- To provide residents with a list of available appointments only the address, trade and length of appointment required are essential. Further information can be collected from other council systems after the repair has been reported e.g cautionary flags about tenants or asbestos data.
- Integrating repairs services directly to scheduling systems would create a simpler system architecture and make it easier to implement new digital services in future.
- The HMS market is dominated by a few large suppliers and as competition is low, there is little incentive to innovate. Not all suppliers currently provide APIs and they are only available with the latest version of their system. One partner council has been quoted £200,000 to upgrade to the latest version of their HMS.
- HMS may not be needed in the future. These systems consist of an asset database packaged with case management, document management and financial management functionality. All of these functions could be performed better by specialist systems in markets with more competition. Some housing providers are already exploring alternatives such as bespoke builds, low code platforms and MS Dynamics.

Technical exploration

What's been done elsewhere...

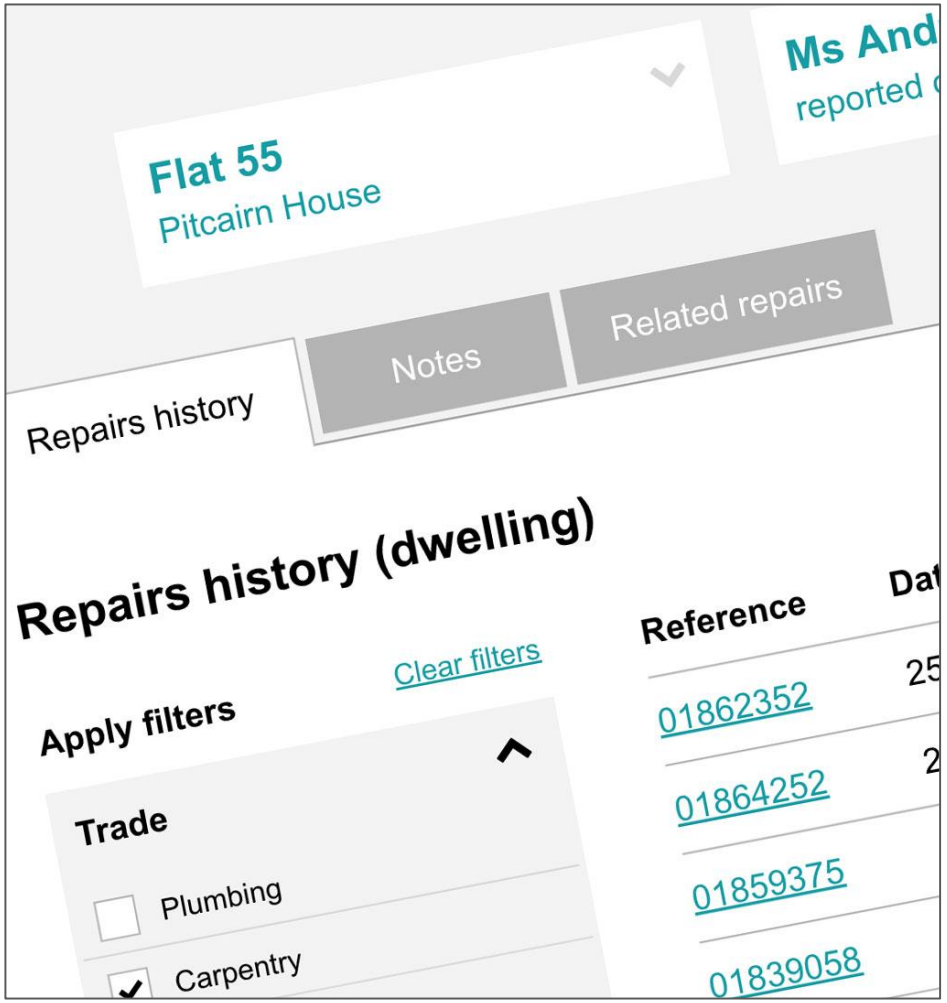
Improving services for social housing repairs is not a new problem and others have already started to tackle it in different ways:

- Bristol City Council: Have worked with PlaceCube to provide a digital repairs service that is integrated with two versions of the Civica housing management system (Civca UH and Civica CX) running alongside each other



- Hackney Council: Has built APIs to expose functionality for existing resident facing systems as well as systems used by staff involved in the repairs service.

- Active Housing: Supply an online repairs reporting and diagnosis tool that also provides appointment booking.
  This product can be implemented with location authentication (i.e postcode look-up) and it has been developed with an integration layer behind it that has API adapters to the most common housing management and scheduling systems.



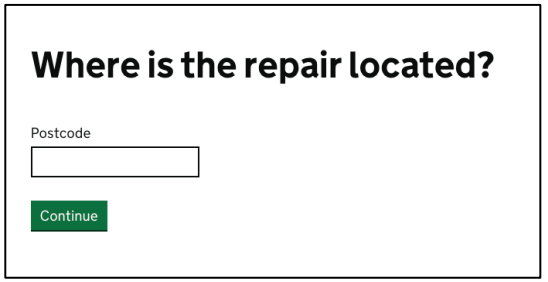
Describing our API

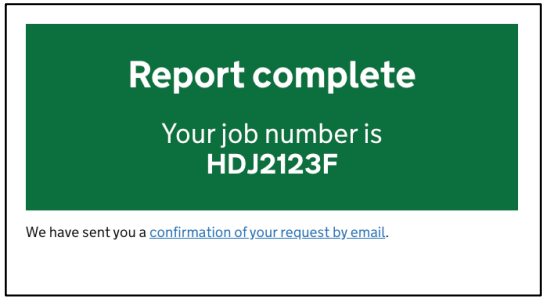
The service pattern requires each council's backend system to respond to three main messages:

1. Return (GET) a set of eligible addresses for a given postcode (so the user can confirm the property address for repair)
2. Return (GET) a set of available appointments for given repair information - results paginated
3. Make (POST) a booking for a repair with given repair, property and supporting information - and send back a reference code and confirmation

An initial version of this has been specified using a tool called Swagger, which shows each message along with example arguments and return values. This API does not include supporting back-end tasks such as linking an address with context such as the presence of a known cautionary contact.

https://app.swaggerhub.com/apis/Unboxed/Repairs/1.0.0





Mapping existing system APIs

Although we were unable to access testing environments of any housing management or scheduling systems, within the timeframe of the project, we reviewed the technical documentation that suppliers shared with us.

Example relevant HMS API calls:

- Property Search
- Get Person Details
- Get Tenancy Details
- Create Service Request
- Create Works Order/Create Works Order Inspection
- No obvious way to retrieve available appointments or to book them

Example Scheduling system API calls:

- No obvious way to retrieve eligible properties
- Create Order (Create Bookings)
- Check Availability
- Schedule Booking

Hackney Repairs API

As part of our technical exploration we also reviewed the API that Hackney Council has built, which consists of these calls:

- List Properties
- Get Property
- Get Cautionary Contacts
- Create Repair
- Get Repair
- List Available Appointments
- Book Appointment

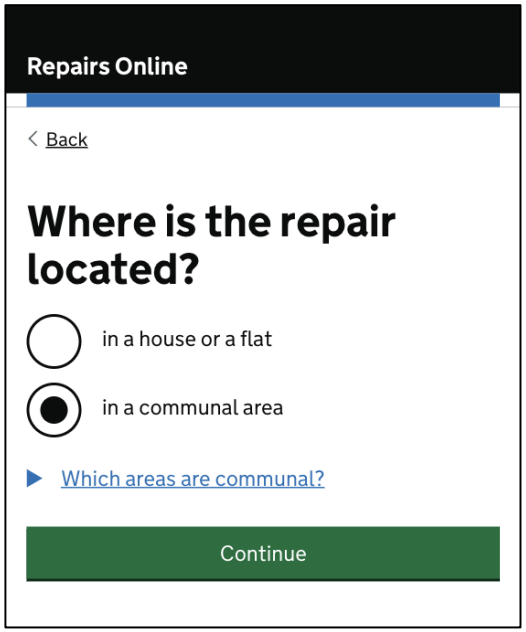
Prototypes and design principles

Prototypes

Following a discussion with project partners we iterated the prototype, that was produced in an earlier phase of the project, to include functionality for reporting communal repairs as well as repairs in residents' homes.

This follows the second principle of the GOV.UK Service Standard to: Solve a whole problem for users.

See the prototype:
Repairs-online-alpha.herokuapp.com
(V4 include communal repairs)



User testing was out of scope for this phase of the project as the focus was on understanding what is technically feasible. Therefore, the iterated prototype will need to be tested with users.

Design principles for beta

Keep diagnosis light-weight

To identify suitable appointment slots the right trade, location and length of job (small, medium, large) needs to be obtained through diagnosis. Asking residents to provide more detailed information about what needs to be repaired will make the online service harder to use and isn't necessary.

Design for flexibility

Councils provide different repairs services, which may be delivered by in-house repairs operatives or through contractors. An online service needs to provide flexibility to cater for this, but the content and components used should remain consistent to ensure they are centred around the needs of residents and have been user tested.

Avoid graphical search options

Some digital repairs services use graphics to aid diagnosis. These can cause confusion if they don't accurately represent what is in a tenant's home, can be problematic on mobile devices and inaccessible as they can't be read by screen-readers.

Solve a whole problem for users

When residents call up they are able to report repairs in their homes and in communal areas. An online service should ideally mirror this experience so that residents are not presented with a fragmented service, which only allows them to report certain types of repairs.

Clearly communicate next steps, to users

Confirmation messages and reminders about upcoming appointments can help to build residents' trust in the online service. However, some scheduling systems also provide this functionality, so any new service should ensure that residents are not sent duplicate notifications from different parts of the system. Residents should also know what they need to do to change or cancel appointments.

Options for beta

Where to add value

WHERE RESIDENTS CAN...	Only report and diagnose repairs over the phone	Report and diagnose repairs online but not book an appointment	Report and diagnose repairs online and also book appointments online
NEXT STEP THAT WOULD ADD VALUE...	User interface for reporting repairs	User interface integrated with a scheduling system	User interface integrated with a variety of council systems (scheduling, HMS etc)

- Resident-facing user interface for reporting and diagnosing repairs.
- GOV.UK Notify integration to share confirmation messages with residents and to alert relevant internal staff about new repairs that have been reported.
- Robust offline processes for managing repairs that are reported online so that residents are offered an appointment quickly.
- Basic functionality to enable councils to access and/or export data, with clearly defined processes for sharing data internally i.e for monitoring

- Resident-facing user interface for reporting and diagnosing repairs and booking an appointment
- GOV.UK Notify integration to share confirmation messages and appointment reminders with residents, and to alert relevant internal staff about new repairs that have been reported.
- Integration with a system that provides scheduling functionality e.g scheduling system or shared calendar.
- Basic functionality to enable councils to access and/or export data, with clearly defined processes for sharing data internally i.e for monitoring

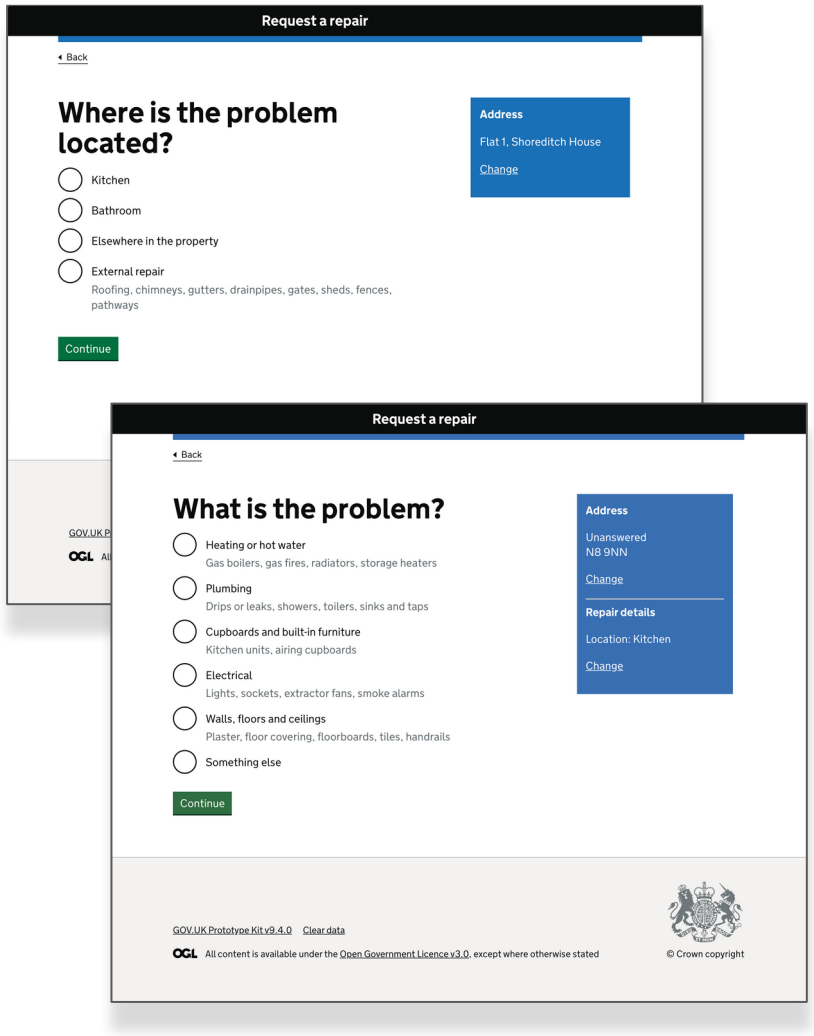
- Resident-facing user interface for reporting and diagnosing repairs and booking an appointment.
- GOV.UK Notify integration to share confirmation messages and appointment reminders with residents, and to alert relevant internal staff about new repairs that have been reported.
- Integration between front-end user interface and a system that provides scheduling functionality e.g scheduling system or shared calendar.
- Integration with other council systems that are used in managing repairs i.e housing management

OPTION ZERO:

Finalise and share the service pattern

Where residents can currently only report repairs over the phone or by email.

- The service pattern that has been developed during this project could be expanded to cover communal repairs and distributed to councils and suppliers.
- This would help raise awareness of user centered design in a social housing context and hopefully encourage councils to hold suppliers to higher standards.
- For smaller suppliers, it allows them to adopt a high quality user experience without having to invest in design.
- There is significant risk in this option as although we can attempt to influence the design of repairs raising products we are reliant on others to implement them.

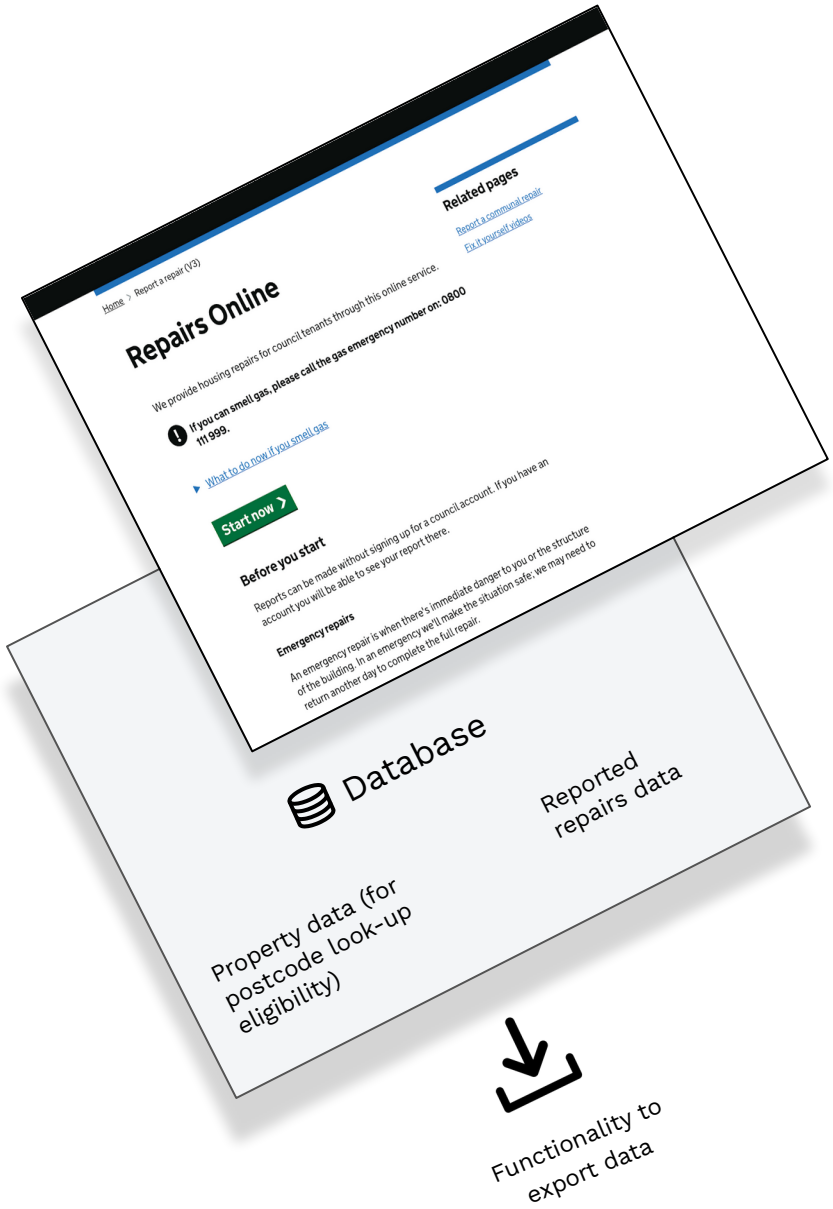


OPTION ONE:

User interface for reporting repairs

Where residents can currently only report repairs over the phone or by email.

- A resident-facing user interface for reporting and diagnosing repairs online, linked to a database of addresses and eligibility for repairs.
- Functionality to send confirmation emails to residents.
- Basic functionality to enable councils to access/export repairs data e.g repairs operatives can access diagnosis details, and data can be manually added to other systems if the council requires (i.e for monitoring purposes).
- A defined process for contacting residents to schedule appointments, clearly communicated to residents.



OPTION ONE:

User interface for reporting repairs

Unknowns / risks:

- Although this option is a ‘first step’ it does not solve a whole problem for users - will this lead to low adoption of the service?
- How can we ensure that users trust the service? Prior research has shown that users are frustrated when they report repairs but do not hear back from the council. What reassurances (e.g notifications and content) do users need to be able to trust that they will receive an equal service online, as over the phone.
- What will be the impact on saving council’s money? Increasing manual processes vs reducing some calls.
- What is the best way to extract diagnosis data supplied by residents so it can be accessed by repairs operatives?

OPTION ONE:

User interface for reporting repairs

Pros

- Out of hours service: Residents will be able to report repairs out of ‘office hours’
- User centred design: Accessible, responsive user interface built around the service pattern and tested with end users (residents)
- Adds value to councils with no inhouse digital expertise: for example, councils that cannot develop their own forms
- Quickest and cheapest option: due to no integration with existing council systems

Cons

- Does not solve a whole problem for users: residents will only be able to report repairs online whereas they may be able to also get an appointment if they call up; reducing the incentive to use the online service. There may be limited adoption.
- Property data will need to be stored in another database: this is currently in the housing management system.
- Minimal value for partners: the majority of partner councils already have a basic web form for reporting repairs
- Will increase manual processes: for example, manually downloading and uploading to other systems. Manually pulling asbestos and cautionary flag data from other systems.
- Limited savings: Due to limited take-up, additional manual processes, and because somebody will still need to contact residents to arrange appointments.

OPTION TWO:

User interface integrated with a scheduling system

Where residents can currently only report repairs over the phone or by email.

- A resident-facing user interface for reporting, diagnosing and booking repairs appointments linked to a database of addresses and eligibility for repairs.
- Notification functionality i.e appointment reminders.
- An API to share repairs diagnostic and desired timeslots, and receive available appointments, between the user interface and a system used for scheduling.
- Basic functionality to enable councils to access/export repairs data i.e where they cannot use the API due to limitations with their existing systems.

OPTION TWO:

User interface integrated with a scheduling system

Unknowns / risks:

- Can we rely on existing integrations between the council's scheduling system and their housing management system to provide repairs operatives with the data they need? For example, tenant vulnerability information and cautionary flags (usually stored in the HMS).
- Can an appointment be generated without a 'Works order' and 'job number' being created first - repairs are usually raised in the HMS first and then linked to the scheduling system. Is it possible to go via the scheduling system first?
- How much will existing systems and integrations need to be reconfigured to take data directly from the user interface? What will be the cost of configuring systems?
- Can we integrate with other types of tools for booking appointments? I.e for councils that don't have scheduling systems.
- Although we are confident that integration with scheduling systems is technically feasible, as they have been developed to sit behind other systems, we have not been able to develop a technical proof of concept as we could not get access to supplier systems within the project timeframe.

OPTION TWO:

User interface integrated with a scheduling system

Pros

- Out of hours service: Residents will be able to report repairs out of ‘office hours’
- User centred design: Accessible, responsive user interface that residents and staff could use.
- End to end journey for residents
- Adds value to majority of councils engaged during this project. This option will also incorporate option one as it involves building an interface
- Potential to shake-up existing processes: for example, challenging the assumption that integration is needed directly with housing management systems
- Potential to drastically reduce calls

Cons

- Property data will need to be stored in another database: this is currently in the housing management system.
- Could generate additional manual processes: e.g where councils do not already have a scheduling system in place, or if integration with an existing scheduling system does not mean the right data is provided to the housing management system (via the scheduler)
- May incur some consultancy costs: if existing integrations or configurations need to be adapted. For example, changes to the way a council’s scheduling system has been configured and/or integrated with the council’s housing management system.

OPTION THREE:

User interface integrated to various council systems

Where residents can currently only report repairs and book appointments via a portal.

- A resident-facing user interface for reporting, diagnosing and booking repairs appointments.
- Notification functionality i.e appointment reminders.
- An API to share and receive appointment and repairs data between the user interface, scheduling system and housing management system.

OPTION THREE:

User interface integrated to various council systems

Unknowns / risks:

- We were not able to access the testing environments of any housing management systems within the timeframe of this project so the level of technical complexity is unknown for this option
- Cost to develop and implement Vs savings for councils
- Many repairs products exist that have been successfully integrated with housing management systems and scheduler systems; we therefore believe this is feasible but we have not been able to run any tests or build a technical proof of concept

OPTION THREE:

User interface integrated to various council systems

Pros

- Out of hours service: Residents will be able to report outside ‘office hours’
- User centred design: Accessible, responsive user interface that residents and staff could use.
- End to end journey for residents
- Potential to drastically reduce calls
- Opportunity to re-use and build on previous work in Hackney Council.

Cons

- Doesn’t challenge the status quo in the short-term: providing adaptors to the most commonly used HMS leaves little incentive for HMS suppliers to change, in the short-term.
- Technically complex: Not all housing management systems systems provide APIs or they are only available with the latest version of the system. One partner council was quoted at least £200k to upgrade.
- Expensive to develop: We are aware that some other councils have developed digital services and integrated them with their existing housing management system, but this has been a lengthy and expensive process.
- Expensive to implement: Each council will have configured their housing management system differently so there is not a ‘one size fits all’ solution. This option is likely to require consultancy with HMS suppliers - onsite consultancy can be cost up to £1200 per day.

OPTION FOUR:

User interface integrated with adaptors to various council systems

Where residents can currently only report repairs and book appointments via a portal.

- Same functionality as in option three A.
- Rather than integrating directly with scheduling and housing management systems, integration is via an adaptor that provides a standardised API surface on top of existing systems.
- Establishing a standard integration point for existing systems will make it easier to implement products from future market entrants, supporting innovation.

OPTION FOUR:

User interface integrated with adaptors to various council systems

Unknowns / risks:

- Widespread adoption of the standard adaptor would be required before it provided benefit to suppliers
- We were not able to access the testing environments of any housing management systems within the timeframe of this project so the level of technical complexity is unknown for this option
- Cost to develop and implement Vs savings for councils
- Two suppliers have already successfully abstracted the integration surfaces of legacy systems in the way proposed; we therefore believe this is feasible but we have not been able to run any tests or build a technical proof of concept

OPTION FOUR:

User interface integrated with adaptors to various council systems

Pros

- Same pros as option three A
- Provides an API surface for councils stuck on older versions of software that do not natively provide one
- Opportunity to open the market to new system suppliers, e.g. of IoT or AI reporting tools, by providing a clearly defined API standard
- Challenges the status quo in the long-term: begins to enable the “strangler pattern” for replacement of legacy systems with new ones built around user needs
- May encourage existing suppliers to voluntarily adopt a standardised API

Cons

- Same cons as option three A
- Adds cost and complexity to project through development of an intermediary layer between user interface and HMS / scheduler system
- Councils with systems that already have APIs would gain no additional benefits in the short term
- Longer term benefits would be dependent on a critical mass of councils or suppliers implementing the adaptor / API design to make it viable for others to target

Other considerations

Should a repairs service be hosted by each individual council or at a national level?

Would the service best operate on a FixMyStreet model, having a central service that councils adopt. Several of the suppliers we interviewed assumed that the service pattern would be implemented in this way, rather than on a council by council basis. Could the ' service be expanded to include diagnosis and appointment booking?

Benefits

- Create a true standard
- Potential to influence the market leaders to develop connector to this service.
- Easier to adopt by majority of councils

Unknowns / risks:

- Would need an in-built scheduling solution and offer connectors to different scheduling systems councils already use
- What would the political implications be of providing a centralised 'front door'?
- Who would be the owner of the service?

Recommendation and costs

Where to begin?

We need to move councils to here.

Partner councils

ROYAL borough of GREENWICH

SOUTH KESTEVEN DISTRICT COUNCIL

Southwark Council

CITY OF Lincoln COUNCIL

Other councils we have engaged with during the project

WARWICK DISTRICT COUNCIL

THE ROYAL BOROUGH OF KENSINGTON AND CHELSEA

KINGSTON UPON THAMES

CAMBRIDGE CITY COUNCIL

Haringey LONDON

Hackney

WHERE RESIDENTS CAN...	Only report and diagnosis repairs over the phone	Report and diagnose repairs online but not book an appointment	Report and diagnose repairs online and also book appointments online
ADD VALUE WITH...	User interface for reporting repairs	User interface integrated with a scheduling system	User interface integrated with a variety of council systems (scheduling, HMS etc)

Recommendation

Each of the three options add value to councils that are at different stages of offering an online repairs service.

Option two would move the majority of councils involved in this project to the next stage - allowing residents to diagnose and report repairs online and book an appointment with a repairs operative.

However, it will disrupt the way councils currently work and some of the savings made from reducing calls may need to be funnelled into new processes required to support the online service. For example, manual extracting data to upload to other systems that are used for monitoring how much the council spends on each property. Reconfiguring existing scheduling systems and how they are integrated with housing management systems (HMS), so that repairs can be raised via the new user interface, may incur costs to implement the service.

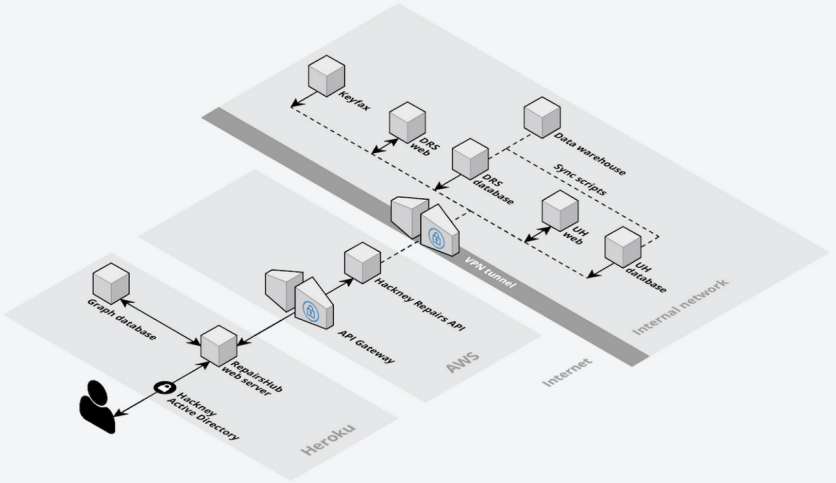
Our hypothesis

We can minimise integration requirements by linking directly to the scheduling system, which has already been integrated with the council's other systems, skipping the housing and contractor management systems. After repairs have been raised, the systems sync with each other "behind the scenes".

Options 3 and 4 build on option 2 and are less disruptive for councils in the short-term as the service will “piggyback” over the existing HMS and scheduler systems, but it is likely to be more technically complex and expensive to develop. Some of the savings from reducing calls may also need to be spent on implementation, such as consultancy fees, to reconfigure existing system set-ups. Some of the work undertaken by other councils, such as Hackney Council, will mean development should not need to start from scratch and as more councils use the service the cost of implementation should decrease.

As there are inconsistencies in the way each council has configured their systems there is no ‘one-size fits all’ solution for implementing the service pattern without requiring changes to existing systems and processes.

Options 2, 3 and 4 carry risks due to not being able to access the development environments of other systems during the technical alpha project. Option 2 is the first step in meeting the needs of residents and is potentially cheaper, however the relative costs of rewriting existing integrations to accommodate it would need to be monitored and weighed up with the potential higher development costs of option 3.



Team and costs

	Team	Cost (range)
Option 1: User interface	1 Service Designer (to develop and map new internal processes) 1 User Interface Designer 1 Researcher (user testing) 2 developers	£150k - £200k
Option 2: User interface, API for integration with systems for scheduling appointments	1 Service Designer (to develop and map new internal processes) 1 User Interface Designer 1 Researcher (user testing) 3 developers	£200k - £250k
Option 3: User interface integrated to various council systems	1 Service Designer (to develop and map new internal processes) 1 User Interface Designer 1 Researcher (user testing) 3 developers	£250k - £300k
Option 4: User interface integrated with adaptors to various council systems	1 Service Designer (to develop and map new internal processes) 1 User Interface Designer 1 Researcher (user testing) 3 developers	Approx £350k *Based on developing adaptors to at least one housing management systems and one scheduling solution*

Breakdown of costs

Thank you

Any questions? Get in touch:

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