



**Alexa, can you help housing and
our communities?**



JUNE 2019

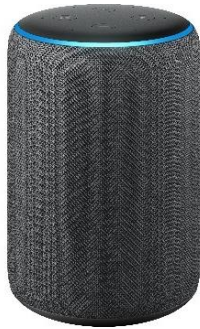
ALEXA, WHAT CAN YOU DO FOR US?

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THE WHYS

WHY AMAZON ALEXA?



Amazon Echo is a smart speaker and home assistant developed by Amazon. “Alexa” is the name of the automated voice which is used by the device to interact with the user.

The basic version of Alexa can tell the time, play music, make to-do lists and reminders as well as answer basic questions through intuitive commands. Simply say “Alexa, what’s the time?” “Alexa, play some Pink Floyd” “Alexa, remind me to get more milk in an hour” “Alexa, what is the capital of Spain?” and you will get a response.

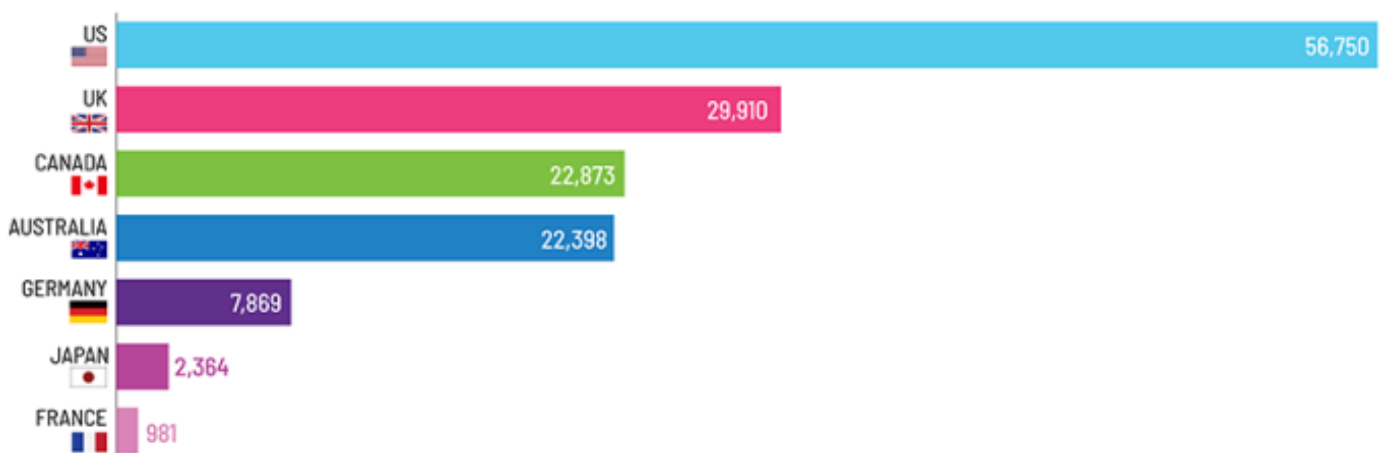
Alexa’s capabilities can be expanded using ‘Skills’, which are like apps for smartphones and tablets, but for Alexa. Many of these are available for free from Amazon’s Alexa Skills library. They can be installed via the Alexa app (available on iOS, Android, Windows and in web browsers through <https://alexa.amazon.co.uk>). These skills span from trivial question-answer games to news updates and even to ordering food to be delivered to your house.

Alexa can turn your home into a smart home with Amazon’s smart plugs, which can be named and controlled via the app or by talking to Alexa. “Alexa, turn on the bedroom lights” and your lights in the bedroom group will be turned on via the smart plugs.

Alexa, when combined with specific Skills and smart technology can empower our tenants and residents and give them tools and information to make their home experience easier and more convenient.

Alexa is widely used all around the world, with over 100 million Alexa-enabled devices already sold globally. Amazon did not specify how many of these are Echo devices or how many are 3rd party premium devices with Alexa built in. There are over 80 000 Skills available for Alexa worldwide, with support for US and UK English, German, French and Japanese

TOTAL ALEXA SKILLS AVAILABLE BY COUNTRY - JAN 2019





There are other alternative devices and software available on the market, such as Google Home and Apple's Home Pod. We decided to work with Alexa on this project as it's a market leader in terms of market penetration, number of skills available, thriving developer community and open resources and hosting.

WHY ARE WE INTERESTED IN ALEXA FOR THE HOUSING SECTOR?

We know from our tenant engagement work that Home Assistant/Smart Speakers like Alexa enabled devices are certainly becoming part of the fabric of homes in Wales.

They are being used in several Health & Social care pilots and projects looking at loneliness and isolation. TPAS Cymru felt that we needed to consider its capabilities in terms of housing & local services, whether that be from a Tenant/Landlord servicing perspective or as an engagement tool.

Alexa is only 4 years old and is constantly evolving. Organisations like Google, Amazon and Apple are in a battle to lead AI developments and this type of screen-less tech will only get better.

DIGITAL INCLUSION AGENDA

We welcome and support the digital inclusion agenda. Across Wales, policy makers and practitioners all agree that digital inclusion can have significant benefits to people's lives, including improved learning opportunities and reduced feelings of isolation and loneliness. The key theme is that we have a more connected and more equal Wales where no one is left behind.

The development of the Digital Inclusion Strategic Framework has been positive, and most Landlords, Local Authorities and support Organisations have strategies to support these objectives.

We are aware of a number of pilots across Wales happening with Smart technology and follow them with interest. We did not want to duplicate their work often focused on older people and isolation or support needs. This research has focused more on tenant engagement/interaction with their landlord and local services which has mass market potential.

WELSH LANGUAGE

Currently Alexa is unable to understand and process commands in Welsh. In fact, world-wide it only understands 4 languages. There is a currently an opensource Welsh language AI development which aims to make Welsh available to screenless tech providers and staff at TPAS Cymru have contributed towards this by testing and helping refine the solution.

Consequently, there are no Skills on the market in Welsh that we could review. We hope that will change.

EXISTING HOUSING ASSOCIATION SKILLS

ACCORD HOUSING ASSOCIATION



Accord Housing Association one of the largest housing and social care associations in the Midlands. Their Alexa Skill appears to be a simple “fact” skill, only offering information about Accord housing Association.

Whenever the skill is opened, Alexa simply says “here is your fact...” and proceeds to narrate a fact about Accord or its partners, what they strive to do and what their past projects involved, such as environmental development, social justice and innovation in construction. This can be accessed by saying “Alexa, ask Accord Housing for a fact about Accord”, but the outcome is the same.

This is a skill that offers dynamic content, meaning each time the fact base is updated remotely, Alexa will be able to narrate the updated facts. Alexa, however, does not inform the user that the data has been updated and it’s up to the user to check the skill for new information.

This skill has no ratings on Alexa Skills.

Advantages	Disadvantages
Can inform users about the organisation	Too simple for practical use
	Limited functionality

GUINNESS HOMES



Guinness Homes is a brand names for the sale of homes owned by The Guinness partnership Limited, Guinness Housing Association Limited and other related Guinness branches. The Guinness Partnership owns and manages nearly 65,000 homes across England, providing services for 140,000 customers and care services for 10,000 people.

Their Alexa Skill is a Flash Briefing Skill, which appears to narrate the 5 most recent entries in the Guinness Homes Twitter feed. Some of these are displayed on the website: <https://www.guinnesshomes.co.uk/> under “tweets”.

The twitter feed is available here: <https://twitter.com/GuinnessHomes>

As tested on May 20th 2019, the feed informs users of the skill about:

1. Registration of interest for a new development – The Waterfront at Gloucester Quays
2. The opening of a 1-bedroom show apartment at Electric Quarter in Brixton
3. A featured tweet by “a happy new shared owner at Electric Quarter”
4. An update about a show home completion for the same property
5. An update on completion of infill garages by a 3rd party contractor.

This skill offers dynamic content, meaning each time the Guinness Homes twitter is updated by the skill owners or developers, Alexa will be able to narrate the updated information. Alexa, however, does not inform the user that the feed has been updated and it’s up to the user to check the feed for new information.

This skill has no ratings on Alexa Skills.

Advantages	Disadvantages
Useful for those not on Twitter to get updates about the organisation	Only offers general information – no personalisation
Each tweet separated by a soft beep, making it easy to tell where one tweet ends and the next starts.	Limited functionality – no interactivity
	Reads out twitter URLs too quickly to be noted down

COTMAN



Cotman Housing Association is one of East Anglia's leading housing associations, owning and managing over 3,300 homes across Norfolk, Suffolk, Essex and Cambridgeshire.

Their Cotman Housing Skill provides 'how to' responses to user queries regarding

- Finding a home
- Reporting a repair
- Paying rent
- Registering for online services
- Universal Credit

When opened, Alexa narrates the options which can be asked and prompts the user to choose one. This can be done directly from the home menu by saying "Alexa, ask Cotman Housing about Universal Credit".

Most of the options work from the Cotman Housing initial prompt when the user only says the keywords like:

- "find a home"
- "repair"
- "pay rent"
- "online services"
- "universal credit"

However, when a user simply says "rent", there is an error and the user is directed to information about Universal Credit, possibly mistaking the word for "credit" instead.

If the user digresses from the 5 options, Alexa says "sorry, I do not understand", closes the skill and the user must then reopen the skill by asking "Alexa, open Cotman Housing" or asking for one of the options available.

The information Alexa narrates is somewhat simple, but it does direct the user to a relevant Cotman Housing website URL where more information is available. For example, when asking to "report a repair", Alexa tells the user the URL they can go to for more information, which is www.cotman-housing.org.uk/customers/report_a_repair which is an existing webpage with the information required and a link which is easy to remember. The skill itself is unable to process payments or log repair requests.



The skill does not have any ratings on Alexa Skills.

Advantages	Disadvantages
Answers a fixed number of commonly asked questions, which reduces the number of people from calling in with the same questions	Only offers general information – no personalisation
Each query has an associated webpage with additional information	Requires user to also be able to navigate the web – not everything can be done over voice.
	Web site addresses are read out and given their length can be difficult to remember straight away, before getting to a web browser
	If you stray off the fixed 5 subjects, you are thrown out of the skill. It should try and refocus your question



Vesper Homes offers property services within the residential sector, including Sales and Lettings, New Homes, Property and Block Management.

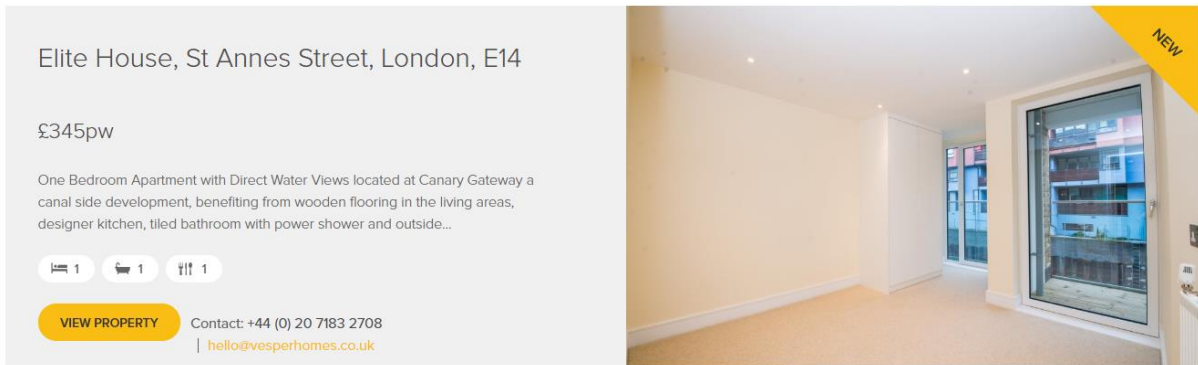
This skill is aimed at PRS landlords and tenants.

The Vesper Homes skill can answer questions a Landlord might want to know without having to contact their office. Uniquely in our review, Tenants can also log maintenance issues through the skill.

The skill’s full version requires the user to email the Vesper Homes team to be added to the Alexa Skill access list.

For testing purposes, the skill was navigated to find any possible information without registration.

After asking “Alexa, when does my tenancy end?” Alexa responded with “What is the first line of the address of the property you are referring to?” Regardless whether the user gives an address of an existing property (e.g. St Anne’s Street, which we got from the website) or any random address, Alexa answers with “the end date of your tenancy is 9th June 2018”, which is almost a year in the past from the date of writing this report. This data is inaccurate, but it shows that the skill is capable of returning information for this query. Accurate data is only available to approved users.



After asking “Alexa, ask Vesper Homes, has my rent been paid?” and answering the address prompt, Alexa responds with “Yes, your rent was paid this month”. This is likely the default answer.

After asking “Alexa, ask Vesper Homes to log a repair” and responding to the address prompt with “St Anne’s Street” Alexa responds with “sorry to hear that you have a problem, in a few words, describe what the issue is and I will log it for you”. Posing as a potential user, we said, “no hot water” and Alexa responded with “Ok I’ve logged it and someone will be in touch soon to resolve it.”

Though there is no way to test whether the skill works as intended unless you are a customer of Vesper Homes, it was a good demonstration of what Amazon Alexa is capable of in the housing sector when it comes to landlords and tenants.

This skill has no ratings on Alexa Skills

Advantages	Disadvantages
(Potentially) real interaction for the user enabling them to find useful data such as rent, repairs and balances.	We were not able to test fully as we are not a landlord or tenant of Vesper Homes.
Interactive and clear	

LIVERPOOL CITY COUNCIL



The Liverpool City Council Skill depends on your device’s registered location, so if no address is available, the skill cannot function. Alexa prompts the user to go to www.liverpool.gov.uk to sort out address issues.

For the purpose of this test, we reset our test Echo device with a random existing address in Liverpool from its Cardiff (TPAS Cymru) address:

XX Fern Grove
Liverpool
L8 0RY

This, however, did not work despite being in Liverpool. The address was not recognised by the system connected to the skill. This seems to be a common problem with a couple of users, who have left reviews on the skill’s official Amazon page.

As Much Use As The Actual Liverpool City Council

★★★★★ by Dave Hayes on December 27, 2018

My address is not recognised (Hunts Cross) therefore the app is as useless as the council themselves. It did however try, which to be fair is more than the council do.
2 of 3 people found this review helpful

HELPFUL

NOT HELPFUL

Could be good

★★★★★ by Seppi Evans on December 13, 2018

Unfortunately it does not recognise my location in Walton so nothing is returned.
1 of 2 people found this review helpful

HELPFUL

NOT HELPFUL

The address was changed to an address much closer to the city centre:

XX Salisbury St
L3 8BT
Liverpool

The address was recognised this time and the app could be accessed. When asking “Alexa, open My Council”, Alexa responds with “you can ask me for council information, like bin collection and library opening times.”

When asked for bin collection time, the Echo device processed the request for about 3 seconds, after which Alexa returned the following “Your purple general rubbish bin will be collected on Wednesday 22nd May, your

blue recycling bin will be collected on Wednesday 29th may and your green waste bin will be collected on Wednesday 29th May.” This is useful information to the user at that specific address.

This was consistent with the information provided on the council website. You can also ask Alexa for bin collection times for a specific bin: Purple Blue or Green.



Bin collection dates

Enter your postcode in the box below to find out your waste and recycling collection dates.

Salisbury Street
Liverpool
L3 8BT
(Try another address)

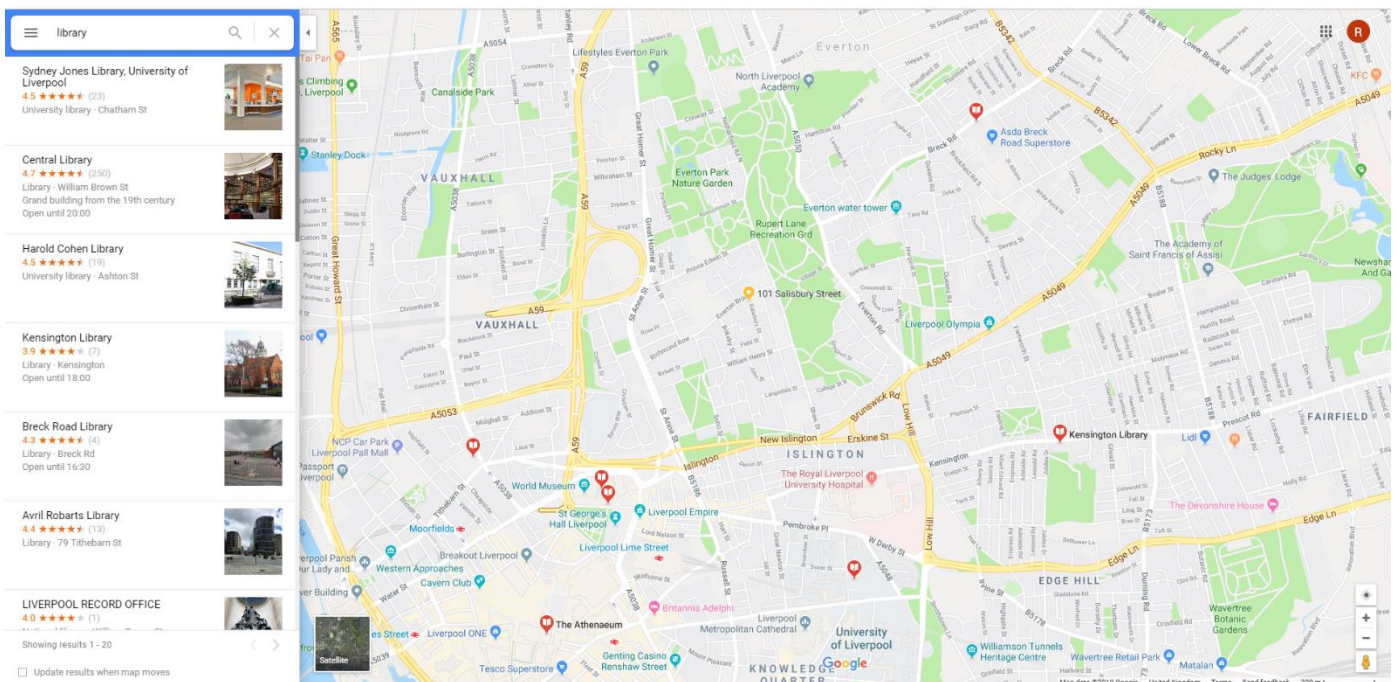
	NEXT DATE	FOLLOWING DATE	AND THEN ON
Refuse	Wednesday, 22nd May	Wednesday, 5th June	Wednesday, 19th June
Recycling	Wednesday, 29th May	Wednesday, 12th June	Wednesday, 26th June
Green	Wednesday, 29th May	Wednesday, 12th June	Wednesday, 26th June

[My Bin Calendar](#)

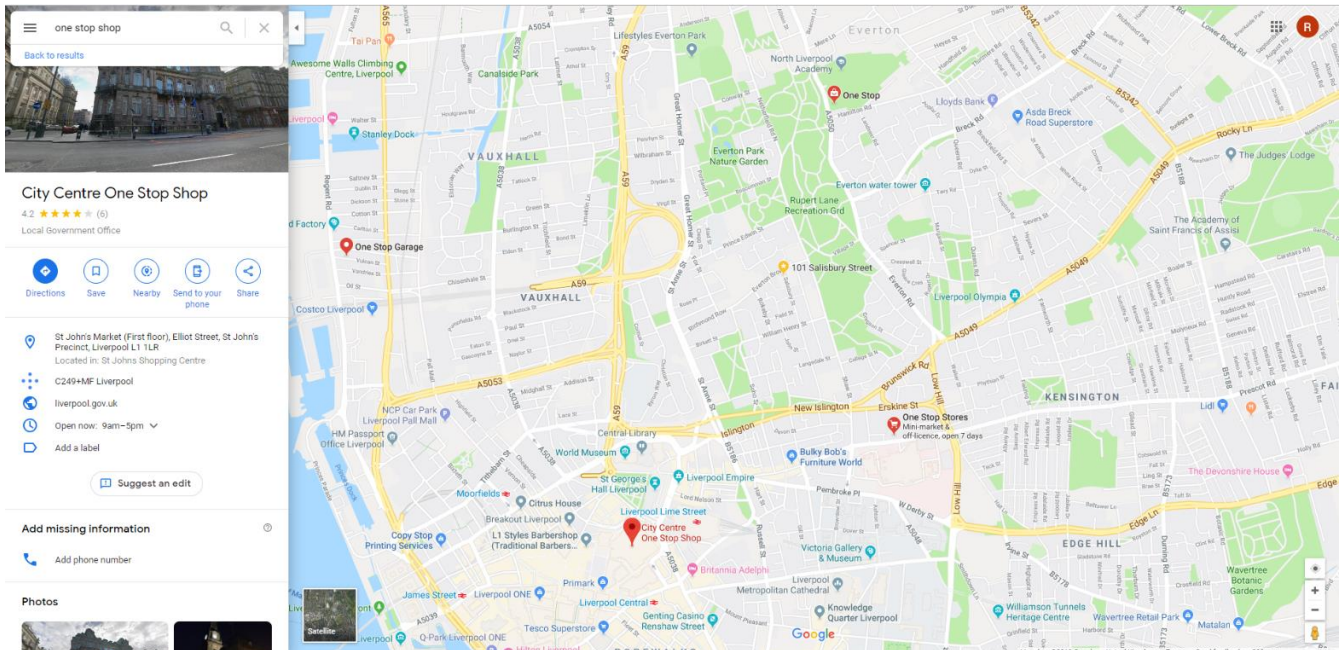
Related pages

- [What can I put in my bin?](#)
- [Bulky Bob's bulky item collection](#)
- [Missed bin collection](#)
- [Request a bin](#)

When asked “Alexa, ask my council where’s my nearest library”, Alexa comes back with “Your nearest library is central library” and announces its address. This is consistent with data found on google maps, where central library is indeed the closest library to the list (excluding university libraries).



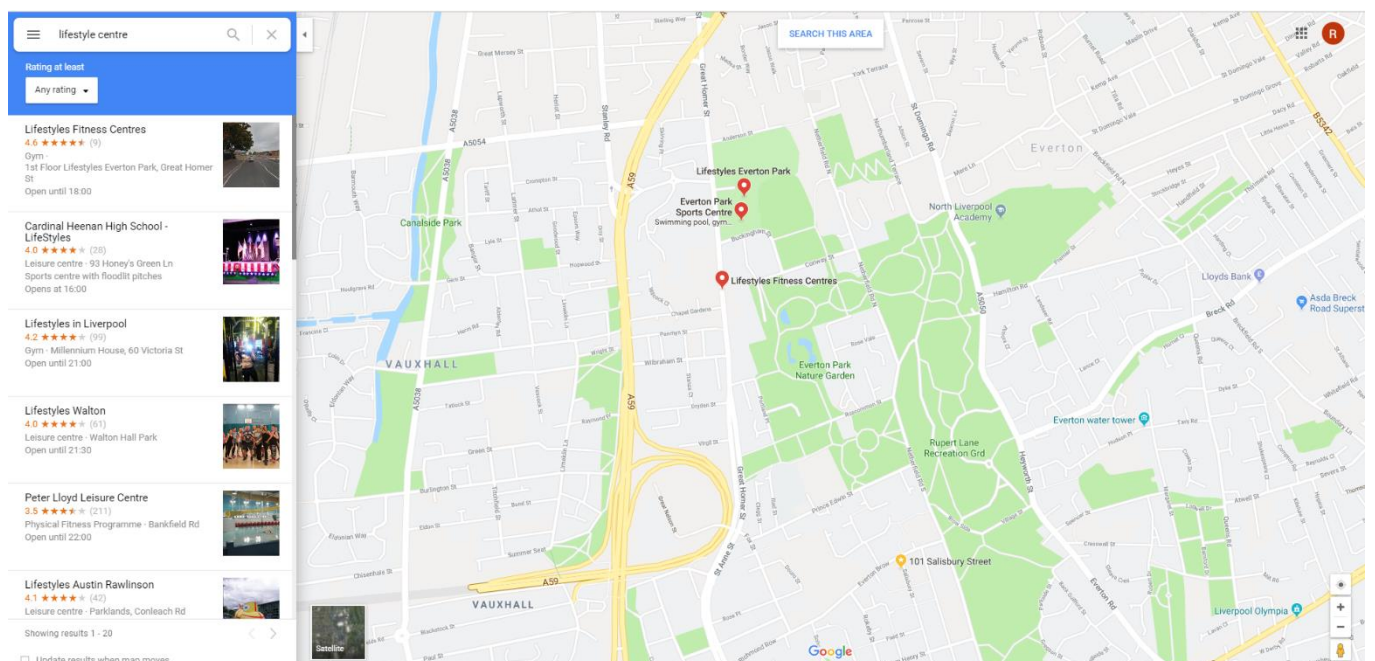
You can also ask for the opening times of any library in Liverpool. If the question is left open ended, Alexa lists opening times for each day of the week, warning that these may vary on Bank Holidays and School Holidays. A user can specify “today” or “tomorrow” to get a limited set of opening times returned. This does not appear to function with set dates or days of the week.



If the location is not recognised, Alexa suggests the user to ask for libraries, One Stop Shops, or lifestyle centres.

When asked, Alexa returned that the nearest one stop shop is “city centre one stop shop” with its address and postcode. This was consistent with Google maps

The same goes for the nearest lifestyle centre “Lifestyles Everton park”. This skill seems to comprehend synonyms like “leisure centre”, but not “sports centre”. This was an important discovery, as it was evident that phrasing has to be very specific for the skill to understand the user’s request properly. During testing,



assuming the role of a person who speaks slowly or would have forgotten the words “lifestyle centre” resulted in Alexa cutting us off and not processing the request, or not recognising alternative phrasing as valid.

The skill also appears to comprehend more complex queries like “when is my nearest one stop shop open tomorrow?” This takes a couple seconds longer to process, but the response is clear and consistent.

One Stop Shops are the information and services hubs of Liverpool Council for Council Tax, Housing Benefit advice and parking permits, which is why the addresses are available through the council website and the Alexa Skill. These locations have been made available for the Alexa Skill, so it is able to tell people the closest location. This is useful but also gives us opportunities for 3rd party data integration via APIs.

The skill has a rating of 3.5/5.0 stars on Alexa Skills, with 4 positive reviews and 2 critical reviews.

Advantages	Disadvantages
Answers commonly asked questions consistently	Will not work with an unrecognised address
Content customised to location	Requires the user to use specific phrasing to get the right output
Processes complex questions	
Provides all information required over voice – user is not required to go online for additional information	

AYLESBURY VALE DISTRICT COUNCIL





Aylesbury Vale District Council provides services for residents of Aylesbury Vale in Buckinghamshire.

Their Alexa Skill requires linking an account, which is essentially some contact information, including an address. An existing address in Aylesbury was used.

AVDC User Registration

Please enter your details to use AVDCs voice based services.

Full Name	Ronnie K
Email	
Address 1	Beaconsfield Road
Address 2	Aylesbury
Address 3	(Optional)
Address 4	(Optional)
Post Code	HP21 7SA

Aylesbury Vale District Council Self-Service has been **successfully linked**.

What to do next:

- Try saying: 'Alexa, ask My Local Authority when is my next bin collection?'
- Close this window to return to the skill page.

This had a few issues at first, like not being able to connect to the skill right after registration, but after a few queries, it worked fine.

The skill page claims the user should be able to ask the following:

- When is my next bin collection?
- What can I recycle?
- Request assisted collection or sharps collection
- How do I pay my Council tax?

When a question about bin collection is left open-ended, Alexa responds with the next bin collection to your registered address/location. A user can also specify which bin they want the collection day for. The results this Alexa Skill provided (Waste and food waste bin collection on Friday 24th May) and responses to subsequent requests about the different bins were consistent with the information on the Aylesbury Vale website.

Results for **BEACONSFIELD ROAD, AYLESBURY, HP21 7SA:**

The next collection is:
WASTE + FOOD WASTE
Friday 24 May
 Please make sure your bin is out for 6:30am

Waste Bin: 	Recycling Bin:  Paper, glass, cardboard, plastics, cartons, cans and tins	Food Waste Bin:  Non-recyclable or compostable
Friday 24 May		Friday 24 May
	Saturday 1 June	Saturday 1 June
Friday 7 June		Friday 7 June
	Friday 14 June	Friday 14 June
Friday 21 June		Friday 21 June
	Friday 28 June	Friday 28 June

When asked “Alexa, ask My Local Authority, what can I recycle”, it responds with a list of acceptable items to recycle, like tins, milk cartons etc., When asked about a certain item, like paper or plastic trays, the response is the same, a list of recyclable items. When asked “can I recycle food?”, the response is the bin collection date for food waste.

When asked about assisted waste collection, Alexa prompts the user to answer “is the assisted waste collection required due to illness, injury, disability, pregnancy or old age?” and only if the response is one of those, will it be able to proceed, asking “how many people live in your household”. If the answer is more than 1, the user must declare that there is nobody able to help put the bins out. The user needs to then state where their bins are located “driveway, front or side of the house or near the garage” after which the skill appears to request assisted waste collection and sends out a confirmation email. If the answer is not satisfactory (i.e. the reason is no valid, or there are others in the household to take the bins) Alexa responds with “Sorry, but you cannot request assisted collection”.

When asked about sharps collection, Alexa prompts “are you registered with AVDC for sharps collection?” (however, there is a bug that lets the user proceed regardless of the answer), then Alexa prompts the user to answer “Is the lid of your sharps box yellow or purple”, then “up to 5 boxes can be collected at once. How many will you have?” then as in the assisted collection, Alexa asks about the location of the bins and files a request to the AVDC and sends out an email. Alexa then wishes the user a great day, which is a nice personal touch.

(The emails are yet to be received, leaving us to speculate whether this feature is fully functional.)

When asked about council tax, Alexa provides general information on direct debit and online payment via the website, where a user can register for monthly payment. Unlike apps discussed previously, Alexa does not provide a URL for the user to input into their browser.

A neat feature in this particular skill, is that at the end of each query, Alexa asks if there is anything else it can do, without exiting the skill, which can be useful if you have many questions, as it saves time having to preface each query with “Alexa, ask My Local Authority....” Additionally, Alexa refers to the user by the name they registered with, making it a more personal experience.

This skill has a rating of 3.0/5.0 stars on Alexa Skills, with 8 positive review, 1 neutral, requesting more features and 8 critical reviews. Most of the issues seem to lie in the registration page and problems with navigating the skill (early days, when it returned the wrong responses and lacked features).

Advantages	Disadvantages
Personal – addresses user by name	Has bugs when it comes to registration – may be frustrating for new users
Content customised to location (for bin collection only)	Invocation name (word used to activate the skill) is a bit too long
Can process waste collection requests over voice – no additional action required (though unsure if this feature works properly) – good for special assistance users	Generic information for council tax and recycling – no custom answers or URLs to follow up in browser
Asks “would you like anything else”, extending use of the skill in a single session, lowers number of times the skill needs to be relaunched	Does not provide all information or carry out all requests over voice – user is required to go online for further action (like paying council tax)

MYPKC – PERTH AND KINROSS COUNCIL



Perth and Kinross Council offers services and information for residence of this area in Scotland.

Their skill was developed to answer FAQs like:

- When is the council open?
 - Alexa provides opening times for the council
- Where is my nearest recycling centre?
 - Alexa provides names of areas with recycling centres
 - User is then asked to visit the website for more information
- How do I report a pothole?
 - Report online on council website

- Provides phone number if the hole is an immediate danger
- How do I get my grit bin refilled?
 - Call a given number or email given address to report the location of empty grit bin
 - Warns that if it is snowy, crews focus on clearing roads, so may take longer to respond.

After an attempt to ask about libraries, shops or bin collection times, to see if the functionality is similar to Liverpool Council’s skill, Alexa responded with “sorry, MyPKC does not have the answer to that yet.”, which suggests that the skill may potentially expand to provide more information and services.

This skill does not have any ratings on Alexa Skills

Advantages	Disadvantages
Answers fixed number of commonly asked questions, which limits the number of people from calling in with the same questions	Only offers general information – no personalisation based on location
Provides phone numbers to call for emergencies	Requires user to also be able to navigate the web – not everything can be done over voice
	‘MYPKC’ isn’t the easiest name to remember

L.A. CITY (LOS ANGELES)



L.A. City council manages the Los Angeles area in California, USA.

The L.A. City skill provides information about events in Los Angeles, does earthquake reports, and plays the local news.

This skill has limited functionality without an L.A. address assigned to the Echo device. It can deliver news, earthquake reports and check for some of the events, but the information becomes more personalised when an address is entered.

For the purpose of this test, the following existing Los Angeles address was entered:

XX E Adams Blvd

Los Angeles

California

90011

USA

When asked for the news, the skill played an audio podcast-type news report – an episode of LA This Week for April 19th. It was however May 21st when this skill was tested, so it seems that the skill’s knowledge base for news segments has not been updated in a month. The report however was specialised to the Los Angeles area, which is a desirable feature. The playing of a short audio file was nice to hear and fits well with the capabilities of an Echo speaker.

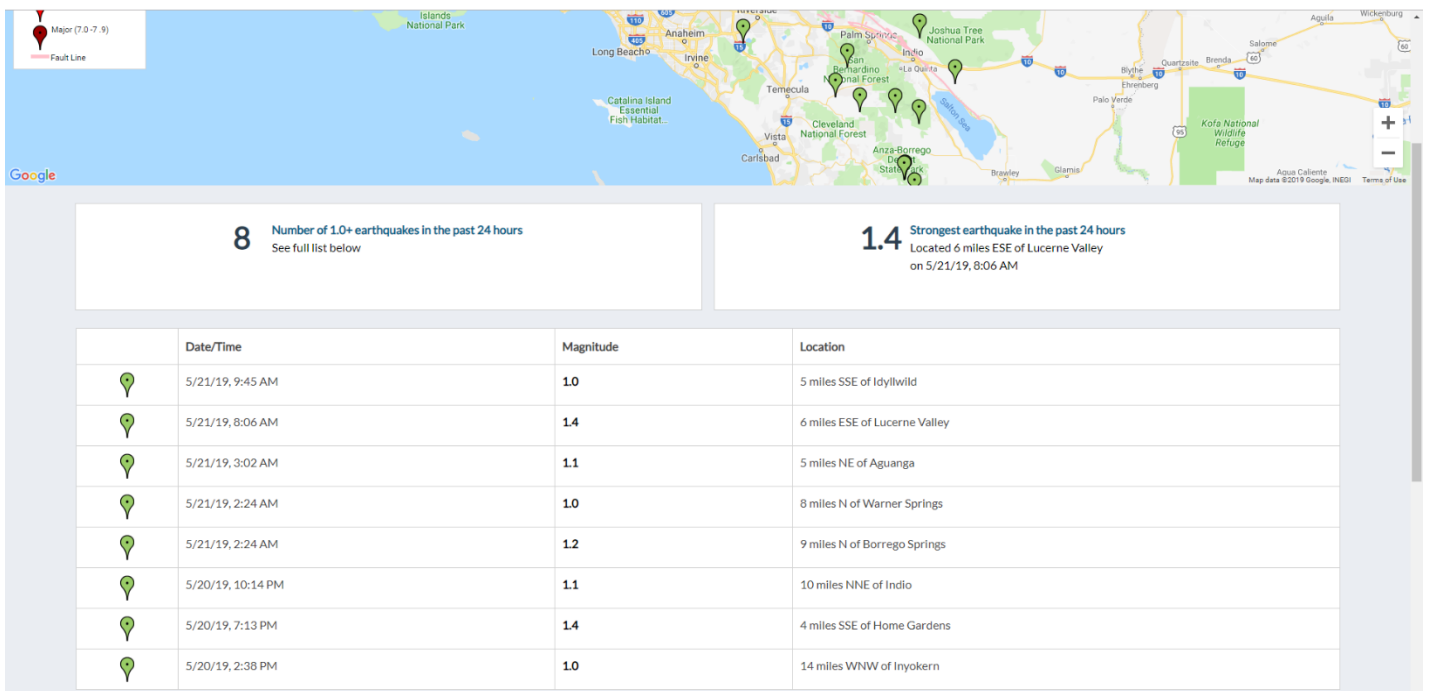
When asked about earthquakes, Alexa reports the number of earthquakes in the past 24 hours, with the magnitude of the weakest and strongest earthquakes and the distance of the epicentre from the address set to the Amazon Echo device. When a test was conducted on May 21st, the following information was provided:

6 earthquakes in the last 24 hours

Most recent earthquake: 1.35 on Richter scale, at 12:06am, 83.0 miles away

Strongest Earthquake: 1.43 on Richter scale, at 11:13am 46.5 miles away

When checking the information on the website suggested at the end of the segment, the data did not appear to match for the times given, however this is because the website displays the time as UK time, while the skill sets the time zone to Los Angeles. Therefore, the data for the earthquakes is consistent between the latest report and the information provided by the Alexa skill.



When asking for events/calendar, Alexa can give information on these types of events:

- Popular
- Family
- City council events
- Council committee (next meeting dates)

9 events for 30th may

1. Scavenger hunt
2. Children's craft program
3. Cross Stitching (spans a month)
4. Neighbourhood science at Robertson library
5. Free movie Thursdays
6. Math madness

After each 3, Alexa asks the user if they would like to hear more about a particular event by saying the event number, or if they would like to hear more events. We were able to ask this once, but after event 6 it wasn't

possible to retrieve more events for some reason. Alexa would not accept input of “more events” or “I would like to hear more events”

This still works for other event types, as long as there are events on the given date. Otherwise Alexa says “sorry, I don’t have any events for that event type and date. Please give another date or event type”, when a user can choose an alternative option. This is a good example of error handling; when a request returns nothing, the skill has an alternative output to give and allows the user to pick something else. This also applies for invalid dates or when the user asks for “this week” or “this month”, which are not supported yet.

However, sometimes something goes wrong with the skill and Alexa announces “sorry, I had trouble accessing your L.A. City skill” and the skill is no longer in use, despite seemingly normal interaction up to that point. This usually happens when asking for city events when no events are available.

This skill has no ratings on Alexa Skills.

Advantages	Disadvantages
Handles errors instead of exiting the skill (most of the time)	Requires user to also be able to navigate the web for additional information
Custom content for the address	Developers or skill owners need to maintain news content - keep it up to date
Interactive and clear	
Regularly updated information (events and earthquakes, not news)	

OTHER RELEVANT SKILLS REVIEWED

TURNING POINT SCOTLAND NEWS



Turning Point Scotland specialises in supporting people facing the most complex and challenging situations. It offers mental health support, support for people with disabilities and learning difficulties among other social services.

Much like Guinness Homes, Turning Point Scotland News is a Flash Briefing Skill, which allows Alexa to read out Turning Point Scotland News alongside other items in the briefing. On May 20th, the following topics were brought up:

1. Mental Health Awareness Week exhibition at Rosie’s café
2. Scotland’s Learning Disability Week – exploring possible technologies which could help, like games consoles and Amazon Echo
3. Happy Retirement to Wendy Spencer
4. Housing First annual conference in Edinburgh
5. Money raised for a melanoma detection machine at Castle Douglas health centre.

The skill does not offer anything else. The content is dynamic, so when the information is updated by the organisation, Alexa will be able to read out the updated news.

This skill does not have any reviews on Alexa Skills.

Advantages	Disadvantages
Useful for those who want updates about the organisation	Only offers general information – no personalisation
	Limited functionality – no interactivity

ARUHI HOUSING LOAN SIMULATION

ARUHI

ARUHI is a mortgage bank in Japan. They have developed an Alexa Skill which calculates the maximum amount a person can borrow through their 'Flat 35' mortgage rates. Calculators via voice are important as forms (whether paper or online) can be daunting and many avoid face to face meetings.

The skill takes user input like age, yearly income (in yen), other monthly loan repayments and calculates the amount the user can still borrow.

Example of use with Amazon's smart speaker Amazon Echo (Alexa)

Alexa, open the housing loan simulation.

Hi! I'll use this skill to calculate the amount you can borrow with ARUHI Flat 35.

Firstly, how old are you?

35.

What was your income last year?

About 3.5 million yen.

How much do you spend on monthly repayments for other loans per month?

20,000 yen.

Thank you. The estimated amount is 〇〇〇 yen.

Using the example provided on the ARUHI website, the amount was calculated to be 22 800 000 yen. The result is for reference only and Alexa advises to apply online for proper screening.

An interesting feature in this skill was input confirmation at each stage, ensuring there is no error. Alexa would ask “can I confirm your age is 35?” and so on for each question.

For a different scenario, a 25-year-old earning 2 mil. Yen a year, with other loan repayments of 400 a month, the estimated amount comes out to be 16 750 000, so it is evident a calculation using interest rates is being done instead of set values being fetched. The interest rates are updated at 8am Japan time on the 1st of every month.

This skill has no ratings on Alexa Skills.

Advantages	Disadvantages
Validates each user response	The invocation name – i.e. the phrase used to open the skill each time “housing loan simulation” is a bit lengthy
Supports multiple languages	For reference only – user still needs to get a real screening
Interactive and clear	
Information is updated regularly	
Practical and useful calculator tool	

SANTA CLARA COUNTY HOUSING STATS



The Santa Clara County Association of REALTORS® (SCCAOR) exists to meet the business, professional and political needs of its members and to promote and protect private property rights. This organisation operates in the United States of America.

Their Alexa skill is advertised to be able to get up to date data/figures on various housing statistics in the county, such as number of closed sales, average days on the market and median price of a property in the county. These figures can be narrowed down to any city in the county.

Unfortunately, it wasn't possible to test this out on our Amazon Echo unit, as it seems the skill is only available in the US Skill store. We were unable to fool Amazon USA to let us download.

Advantages	Disadvantages
On request, users can obtain useful, housing-related data by asking the skill	Not possible to test, so it is unclear how usable this skill is, how accurate the data is or how far the scope of the skill can go

Why is this interesting? It shows that housing data based on locations can be made available and opens possibilities for housing and communities in Wales. RSLs and Local Authorities can make statistics and data more transparent.

It also struck a chord with us re Wales Wide housing data. These is a website with similar functionality from Welsh Government: Housing Association comparison tool. It can compare different housing associations on several criteria, such as

- RSL information
- Financial Information
- Tenant Satisfaction
- Welsh Housing Quality Standard

This shows an image of a graph produced on the webpage, where a user can compare the different housing associations on these criteria.



After some investigation, it was discovered that the online tool can be challenging to navigate without any prior instructions (it wasn't clear that the different statistics for the category would be on different pages). Some text was hard to read, and it wasn't possible to zoom in, as the graphs would scale themselves to the size of the screen. The interface the developers used was Microsoft Power BI – a powerful tool for turning raw numbers into graphs for simpler visual representation. However, the way this tool was implemented may need further work.



Combining the data set from Welsh Government and the SCCAoR's idea for an Alexa Skill could result in a powerful tool for tenants and landlords to use.

WALES – SPECIFIC SKILLS

After looking at a few skills specific to Wales, we saw that it was mostly trivial, like fact narration or quiz games, as well as a couple of news briefing skills, but nothing too special that we haven't seen before or anything relevant to the housing sector.

A lot of these skills also have low ratings, so it seems Wales specific Alexa skills need a lot of work. There is no support for the Welsh language in Alexa yet, but it is in development.

	<p>Wales Facts FREE Available instantly on your connected Alexa device.</p>		<p>Business News Wales FREE Available instantly on your connected Alexa device.</p>
	<p>Wales Rugby History FREE Available instantly on your connected Alexa device.</p>		<p>WalesOnline News Briefing ★★★★☆ ~ 6 FREE Available instantly on your connected Alexa device.</p>
	<p>Welsh Phrases ★★★★☆ ~ 3 FREE Available instantly on your connected Alexa device.</p>		<p>Swansea Guide FREE Available instantly on your connected Alexa device.</p>

TEST FAIL – VOICE CHAT

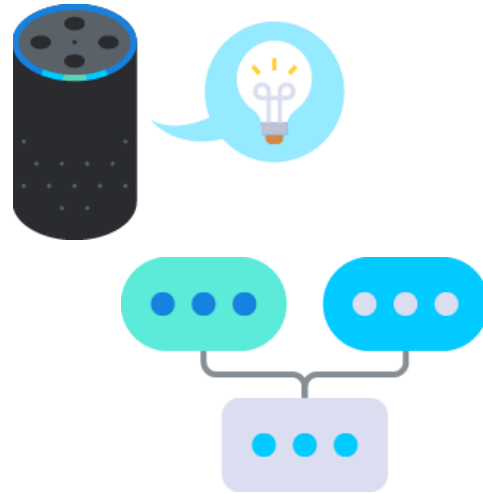
We noted in our research that some family/relatives can talk to one another via their Alexa devices. We thought that was an interesting option for Housing Officers/Support workers/Wardens of Sheltered schemes etc to stay in touch with people they support. Unfortunately, in the research time for this project we were unable to get that working in our tests.

PHASE 2 - THE HOWS

HOW DO ALEXA SKILLS WORK?

There are several types of skills which can be built from templates using the easily accessible Amazon Developer toolkit. There is also a custom option for building unique user experiences. These include

- Simple types
 - Fact Skill
 - Quiz Game Skill
 - Trivia Skill
 - How-to skill
 - Team Lookup Skill
- Complex types
 - Calendar Reader Skill
 - RSS/Twitter Feed Reader Skill
 - Audio Player Skill
 - City Guide Skill
 - Decision Tree Skill
 - Interactive Adventure Game Skill



As seen earlier in the report, we can see what type each explored skill belongs to.

<i>Skill name</i>	<i>Type</i>
<i>Accord Housing Association</i>	Fact Skill
<i>Guinness Homes</i>	Feed Reader Skill
<i>Cotman</i>	How-To Skill
<i>Liverpool City Council</i>	Decision tree (multiple choices to navigate) Calendar Reader (bin collection schedule)
<i>Aylesbury Vale District Council</i>	Decision tree (multiple choices to navigate, especially with assisted waste collection) How-to skill
<i>Turning Point Scotland News</i>	Feed Reader
<i>ARUHI Housing Loan Simulation</i>	Decision Tree
<i>MyPKC – Perth and Kinross Council</i>	How-to skill
<i>L.A. City</i>	Decision Tree (multiple choices) Calendar reader (events) How-to (further information) Feed reader (news)
<i>Vesper Homes</i>	Decision Tree (multiple choices)

Interacting with Alexa is based on speaking and listening, as opposed to reading information on screen and interacting with it by clicking or tapping. This must be considered when designing skills. Alexa uses speech recognition to convert human input into something a computer can understand. Most of the processing is done in the cloud (hence the few second waiting times after you ask Alexa something via a skill) using Alexa Voice Services. After a user asks Alexa something, the recording of a user's voice is sent to the cloud and processed, then AVS sends back the response that the Echo then plays back in Alexa's voice.

Alexa Skills expand this functionality to suit the skill creator's needs. The command to trigger a skill consists of 3 parts:



You would have already seen these earlier on in the report, where the skills have invocation names like "MyPKC", "my Local Authority" or "my council" and utterances which are like keywords that Alexa Skills look out for to form the request and correctly identify the data to be returned to the user, like "bin collection" or "council tax".

Alexa identifies the user's intent, then sends the information to a third-party server as needed (e.g. Guinness Homes needs to fetch the 5 most recent tweets to read them out)

NOTE: NAMING CONVENTION FOR SKILLS [INVOCATION NAME]

Liverpool have already 'landgrabbed' the name 'My Council' and Aylesbury has 'My Local authority'. Others have used more complex names like 'MyPKC' but a user has to remember that name. If a user just said 'open my council' it offers to talk you to the Skills library to download the Liverpool skill.

We observed that nobody on the test date has a skill using the following invocation name 'my housing association' 'my RSL' 'my local council' or popular Welsh housing terms like 'Cartrefi' or 'Cantref' etc. There are also a number of 'Vale of X' in Wales and in England so would imagine 'myVale' might get snapped up also.

If you are a TPAS Cymru member, talk to us as we could secure a particular invocation name with a simple skill for a small fee.

WHAT ABOUT SECURITY?

Alexa does not process data, but merely acts as a controller, passing data between the user and the backend (database, relevant APIs, any other data storage etc.), therefore the data is only as safe as the developer of the skill/database/API makes it to be. Amazon have stated: for Alexa skills, we are not processing data on your client's behalf, and your client would not be processing data on our behalf

Another Amazon spokesperson clarified "no audio is stored unless the Alexa-enabled device is activated by a wake word." so Alexa can hear but it's not always listening.

Skills that just personalise general data like 'nearest library or bin collection dates are not giving out any identifiable person data. For submitting a complaint, repair etc the API for database will append the users ID. The the Skills want to give personal data like rent balance, council tax payments etc then it might need a password/PIN like some the skills used in e-commerce

WHAT HAVE WE'VE TAKEN AWAY FROM THE RESEARCH?

Having seen a few skills relevant to the housing sector, there are some skill formats that stand out as “good” and would be suitable for our own skill.

1. Q&A skills which can provide tenants and landlords with information if it is personalised. The research showed that fixed data can only go so far, mostly pointing people to a webpage with yet more information. Ideally, we would want a skill that provides personalised answers to questions without the need to also use a smartphone or computer.
2. RSS/Twitter feed reader skills can provide up to date information from TPAS Cymru along with other skills. This can either be done via Alexa’s voice or with a separate audio file. (see next section)
3. Audio file playback. As seen in the L.A. City skill (and the default BBC News skill that comes with Echo), it is possible for Alexa to play back recorded audio segments as an alternative to the synthesised voice reading out text. This can be more engaging to users and this method can bypass the lack of Welsh language understanding by Alexa. Updates can be recorded in both English and Welsh and played back.

USAGE IDEAS FOR TPAS CYMRU OR HOUSING/COUNCIL/COMMUNITIES

1. Services
 - a. Tennant can report a fault
 - b. Landlord can be informed of a fault in their property
 - c. Requesting an item, service or person
 - d. Checking opening times of shops, repair services, tenant support etc.,
 - e. Checking bin days (doesn’t have to be just local council- could integrate from a LA using an API)
 - f. Requesting assisted waste collection or sharps collection
2. Payment and rent
 - a. Checking balance
 - b. Checking rent due date
 - c. Checking if rent has been paid or not
 - d. Checking for a location where you can pay rent
3. Calculators and tools
 - a. Rent affordability calculator
 - b. Credit Union loan calculator
4. Data and insight
 - a. What housing units are available locally given a certain feature
 - i. Area
 - ii. Price range
 - iii. Number of bedrooms
 - iv. Flat/house
 - b. What the average rent price is given a certain feature
 - i. Housing association
 - ii. Area
 - iii. Number of bedrooms
5. Tenant engagement
 - a. Checking for the nearest tenant group
 - b. Checking for upcoming tenant events

- c. Checking for contact information for tenant group/chair
- d. Report feedback or suggestions for area or estate
- 6. Audio Briefings
 - a. Monthly news in mini-podcast-style for things like policy updates / housing news/ community round up.

DESIRABLE FEATURES

1. A short and memorable invocation name (word used to activate the skill)
2. Clear and simple language – easy for people to follow
3. Clear command prompts from Alexa
4. Input validation as appropriate
5. “Would you like anything else?” prompt, to reduce the number of times the skill has to be reactivated if the user has more queries

WHAT IS TPAS CYMRU DEVELOPING?

We are not an RSL or LA and therefore our resources are much smaller, and we have limited data integration options. However, as part of this research we wanted to test the ease and usability of the Amazon Developer toolkit.

Initially, we came up with the idea of starting with a skill which gives weekly tips for tenant engagement and build up from there, either in a single skill or a collection of skills.

A collection of skills will allow TPAS Cymru to have a presence over a range of services and won't overcomplicate one skill. It would not be good design if Alexa narrates a long list of options as the skill is launched, as it is likely that a user will forget the first entry after they have listened to the whole list. Less is more.

DEVELOPMENT OF OUR SKILL

It took approx. 2 days for the first one:

- 1) Get set up and navigate the Skills Developer tool kit.
- 2) Create a draft skill
- 3) Test for bugs
- 4) Get Alexa to say 'TPAS Cymru' correctly! – 'tee pass come ree'

Knowledge of JavaScript is an advantage for developing functionality outside of the fixed templates/toolkit.

The plan is to launch this first skill to the marketplace with this paper and member webinar.

WHAT ARE YOUR THOUGHTS?

If you have feedback on this paper or wish to discuss further, get in touch with TPAS Cymru.

We are available to support or develop options for your organisation.

If you wish us to present or talk to your board, leadership team or a tenant group we would love to hear from you.

ABOUT TPAS CYMRU



TPAS Cymru has supported social housing tenants and landlords in Wales for more than 30 years and has a strong track record in developing effective participation through training, support, practical projects and policy development. We have an extensive knowledge of housing with a focus on issues from the tenant perspective and for tenants' benefit.

Locally we are developing best practice at landlord, tenant group and project level through practical advice, support, training and project work. Across Wales we improve the quality of tenant participation through disseminating and promoting good practice.

At Government level we contribute to policy change channelling the experience and needs of tenants and landlords to policy makers and working with partner organisations to influence policy.

ABOUT THE AUTHOR



Veronika Kravchenko is a 3rd year student at Cardiff University, studying Applied Software Engineering.

She is interested in robotics and automation, foreign languages and helping the environment.

This project was initiated and supervised by David Wilton of TPAS Cymru.