

2018/19 ECR Project

**Reinventing renting: The application
of digital technology in housing for
'generation rent'**

Final Report

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1. Introduction

Digital technology is transforming the way we live and work. The aim of this research is to understand how digital technology is being used within the private rented sector.

Home ownership is declining and over 20% of the UK population now lives in the private rented sector, set to rise further over the next decade. In 2017, the build-to-rent market attracted £2.4bn in investment and it is forecast to grow by a further 180% over the next six years (Trup, 2018).

Within the private rented sector, digital technology is increasingly being used to facilitate greater access and convenience, efficiency in management and a sense of community amongst residents. As the availability of this technology increases, and intersects with other societal shifts such as nomadic working patterns and later family formation, it is likely that future generations are going to live together in different ways to the households of the previous and current generations.

This project explores the use of digital technology in private rented accommodation. It considers the application of digital technology in three areas: access to properties, management of properties and lived experience.

1.1. Research questions

This project addresses the following research questions:

1. How is the private rented sector changing, and what forms of shared housing are emerging?
2. What is the experience of 'generation rent'?
3. How is digital technology being used in the private rented sector for and by 'generation rent'?
4. What are the opportunities and barriers to wider use and adoption of digital technology in the private rented sector to meet the needs of 'generation rent'?

1.2. Methods

1. The first stage in the research was to conduct a desk-based review of literature around the private rented sector (PRS), 'generation rent', and digital innovation.
2. Interviews with housing providers were conducted to discuss their use of digital technology, their views on its future use and their current housing models.

3. Interviews with technology providers were conducted to ask them about the market in digital technology in the PRS, the scope for growth and what they see as future commercial opportunities.
4. An online survey of residents living in the PRS was conducted and was disseminated via various housing websites and through social media.
5. Follow-up interviews with residents living in the PRS were conducted via telephone to get a more in-depth understanding of their use of technology at home and its future potential.

2. Literature review

2.1. The emergence of the 'digital nomad'

The phrase 'digital nomad' is generally traced back to 1997 and the publication of the book 'Digital Nomad' by Tsugio Makimoto and David Manners (1997), which envisioned a world in which the nature of work would be revolutionised by the possibilities of the internet. The hours of work would be at the choice of the worker, who would no longer be bound by physical location to a particular office, but free to work from any part of the world possessing an internet connection.

The original utopian vision contained in the phrase has now become generally applied to the more mundane existence of the self-employed worker, equipped with a laptop, whose office is the nearest coffee shop, and who leads a rootless and nomadic existence in the city, moving from one house share to another in the private rented sector.

The existence of this growing population of 'digital nomads' has created new markets within the private rented sector, and new forms of housing that aim to cater for the needs of a (relatively) young population.

2.2. The growth of the private rented sector

While 90% of the population of the UK lived in the private rented sector in 1900, by 1990, the private rented sector in the UK was widely assumed to be on the verge of extinction, at less than 10% of the housing stock, dwarfed by the growth in owner occupation and the social rented sector.

Instead, owner occupation has shrunk significantly since that time, and the social rented sector has been steadily reduced by sales through the Right to Buy. The private rented sector has expanded to fill most of the resulting gap, primarily through deregulation in 1988 and by the development of the Buy to Let market from the mid 1990s, which has allowed large numbers of investors to become landlords.

Over the twenty years between 1996/97 and 2016/17, the private rented sector more than doubled in size, from around 2m households to 4.7m, and from around 10% of households to more than 20%. This has changed the contribution of the sector from 'a marginal to a mainstream tenure' (Rugg and Rhodes, 2018). The extent of this revival 'was predicted neither by government nor informed commentators' (Scanlon and Whitehead).

There are no systematic statistics collected on the characteristics of the private rented sector, but recent surveys (Scanlon and Whitehead, 2016) estimate that 62% of landlords owned only one property, while only 7% owned five or more. However, these provided 40% of all lettings, while

single property owners provided some 30%. Other estimates (Rugg and Rhodes, 2018) suggest that there are some 2.3m private landlords in England.

Not only is ownership dispersed in the private rented sector, but so are the properties. Scanlon and Whitehead estimated that only 6% of the stock consisted of entire blocks of flats or converted houses: the remainder of the stock consisted of individual flats and houses, although a tenant survey¹ estimated that 12% of tenants lived in accommodation run by a large-scale corporate landlord, such as large estates, property companies and private institutions (Knight Frank, 2017).

Analysis from the most representative survey of the private rented sector, the English Housing Survey 2016/17, has shown that this expansion of the sector has changed its character over the period, with a fall in the proportion of young people aged 16-24, and a rise in the proportion of households aged 35-44 and 45-54, although the absolute numbers of households has increased sharply in all age groups except for those aged 75 and over.

As a result, there has been a shift in the types of households in the sector over the period, with smaller proportions of single people (down from 37% in 1996/97 to 27% in 2016/17) and increasing proportions of families with children, although again all types of household have seen a significant increase in absolute numbers.

Unlike owner occupation and social housing, however, the sector remains highly mobile, with a quarter of all tenants having lived in their home for less than a year. Just over half (51.4%) of all newly forming households found somewhere to live in the private rented sector, and nearly one in five tenants (18.3%) moved from one privately rented home to another within a year, compared to one in forty among owner occupiers and one in twenty five among social tenants. This rate of 'churn' has increased over the last twenty years, accounting for 72% of all private sector moves in 2016/17, compared with 57% in 1996/97.

Lack of security in the private rented sector is a factor in unwanted moves (House of Commons, 2018), with 10% of all moves (and 30% among those aged 65-74) caused by the tenant being given notice by their landlord.

Despite the expansion of the private rented sector over the period, it is not yet seen as a viable long term prospect: between 80% and 70% of tenants aged 16-44 expected to buy a property at some point in the future, although this proportion then falls rapidly with increasing age (EHS 2016/17). However, other survey evidence suggests that home ownership may only be a long term aspiration for many renters, with only a third of renters expecting to be able to buy within the next three years (Knight Frank, 2017).

¹ Online survey of 10,218 adults by YouGov plc for Knight Frank, 2017

Just over a quarter, or 1.3 million, of privately rented homes failed to meet the Decent Homes Standard in 2016/17, compared to 20% of owner occupied homes and 13% of social housing (EHS 2016/17). Although the relatively poor quality of property in the private rented sector has been a long standing problem, evidence from surveys of tenants suggest that a variety of factors affecting the whole 'end to end' experience of renting in the private sector are of greater importance to tenants. One such survey made seventeen recommendations to government, designed to improve the 'tenant journey', of which only one (that the fitting of carbon monoxide alarms and annual electrical checks should be made compulsory) was concerned with the physical housing stock: the other sixteen recommendations concerned the process and regulation of renting (Which, 2018).

Overall, tenants in the private rented sector had much lower levels of satisfaction with their current tenure, with only 68% either very or fairly satisfied, compared to social tenants (83%) or owner occupiers (98%) (EHS 2016/17).

2.3. Tenant preferences in renting

Increasing investor interest in Build to Rent, combined with evidence of tenant dissatisfaction with their experience of renting, has resulted in a number of surveys of tenant opinion and preferences by commercial organisations such as property agents and consumer review websites, which are aimed at investors and developers of new build property in the broadly defined Build to Rent market.

These surveys have paid little attention to the 'bricks and mortar' aspects of new construction, and are instead focused on 'added value' elements of the tenant experience, ranging from property search, through the letting process, to the features and amenities offered by the development beyond the individual units and circulation spaces.

One such survey (LSL, 2018) attempted to measure both interest in, and willingness to pay for, a range of facilities that developers might provide, as summarised in the table below.

Table 1 Tenant facilities

Facilities that tenants would pay more for per month	% would pay more	£ would pay
Pets allowed	32%	£24
High speed internet	31%	£19
Parking	29%	£20
Garden	27%	£25
Satellite/cable TV	22%	£23
House cleaning services	17%	£28
Balcony	15%	£23
Parcel collection / onsite dropbox	10%	£8
Bike storage	6%	£10
Onsite management	5%	£15

Source: PRSim for LSL: Tenant Survey 2018

The same survey also attempted to measure both interest in, and willingness to pay for, a range of facilities that developers might build into new developments, again summarised in the table below.

Table 2 Tenant facilities in new developments

Interest in and willingness to pay for facilities (monthly)	% would pay more	£ would pay
Onsite gym	50%	£16
Laundry	43%	£12
Communal garden / open space	42%	£14
Recreational room	41%	£12
Roof terrace	36%	£14
Creche / childcare club	36%	£24
Children's playground	35%	£13
Vegetable allotment	35%	£11
Games room	35%	£11
Working from home hub	32%	£13

Source: PRSim for LSL: Tenant Survey 2018

The survey noted that the response to individual items varied according to their adopted typology of tenants, so that 'Younger Independents' were more likely to prioritise a gym, while 'Budgeting Families' were more likely to favour a crèche or children's playground.

Another survey had developed an alternative typology to characterise tenant households, identifying nine types (Knight Frank, 2017):

- iGens (<25)
- Nesters (Couples, 25-49)
- Soloists (Single, 25-49)
- Sharers (25-49)
- Families (<35)
- Families (>35)
- Active Living (Soloists, 50-65)
- Active Living (Couples, 56-64)
- Baby Boomers (over 65)

Each type is identified by its typical patterns of behaviour, so that Active Living Couples' primary reason for renting is that it 'allows them to live in an area too expensive to buy', and so on.

An alternative approach to analysing tenant opinion and preference is taken by a consumer opinion website (Homeview 2019), which publishes tenant and occupier comments on the development in which they live, in a manner similar to hotel reviews on TripAdvisor or restaurant reviews on Zagat. The developments surveyed are nearly all within the M25, and have been built in recent years. Homeview surveyed tenants who had written a review to form their sample. The findings from the survey open with the headline '1 in 4 private tenants would not recommend their landlord', but have the overall conclusion that Build to Rent tenants are more satisfied than the tenants of Build to Sell developments (Homeview, 2019).

2.4. Generation Rent and Millennials

The phrase 'Generation Rent' was first used in 2011 to describe the third of 20-45 year olds who at that time had no realistic prospect of owning their own home in the next five years (NatCen 2014).

A combination of low housing supply, rising house prices, stagnant wages, and credit restrictions on mortgage lending imposed since 2008, have increasingly restricted access to home ownership to those able to borrow the amount required for a deposit from family or friends (the 'Bank of Mum and Dad'). A household able to save 5% of their disposable income each year would have needed to save for 10 years in the year 2000, but would have needed to save for 31 years by the year 2011, although this average concealed a wide geographic dispersion between 24 years in the North of England and 54 years in London (Resolution Foundation 2011).

The generation of people born between the mid 1980s and mid 1990s, now aged between 25 and 34, and who entered adulthood in the midst of the 2008 financial crisis have been characterised as 'Millennials'. In 2016, 59% of this generation were still renting, and only 38% were buying a home, in contrast to the position twenty years earlier in 1996, when 55% of households led by 25-29 year olds were owner occupiers, rising to 68% among 30-34 year olds (HoC Briefing Paper April 2017).

Rugg and Rhodes (2018) highlight that 'Generation Rent' generally seeks cheaper independent accommodation, often in shared lets since high rental costs and student debt prevent them from accessing self-contained units.

Shared housing is quite under-researched (Muir, 2018). While in the past, shared housing was a relatively short transitional stage between the family home and home ownership, demographic changes mean that shared housing is now becoming a long-term housing solution. Shared living is predicted to become more common in the future, due to unaffordable housing and tenant preferences for more connections and communal activities (LSL, 2016). The prevalence of shared housing varies by region: Knight Frank (2017) suggest that, across the UK, 12% of the households in the PRS are sharers, but in London, the proportion of sharer households rises to 26%.

With little immediate prospect of significant change in income growth, a fall in house prices or the relaxation of credit constraints, housing market commentators expect a continuing rise in the numbers of households in 'Generation Rent' at least until 2025 (PWC, 2015).

2.5. The emergence and growth of Build to Rent

The phrase 'Build to Rent' is broadly used to describe developments which are designed and built to be sold to single investors (usually institutional) for renting: the term is used in opposition to the more usual condition of Build for Sale, which has been the normal method employed by the housebuilding industry, whereby individual houses or flats are sold to individual purchasers, either for their own use or to let out (the major housebuilders estimate that some 10% of their sales are to private landlords).

Build to Rent is generally associated with blocks of flats or apartments, and generally with medium or large scale developments, although there is no particular reason why a whole development of individual houses could not be sold to a single investor and managed as a single entity. In London, for example, the Mayor's Affordable Housing and Supplementary Planning Guidance defines a Build to Rent development as one which (among other criteria) has at least 50 homes, and is held for rent under a covenant of at least fifteen years (London Councils, 2017).

Over the last decade, successive governments have supported the development of large scale institutional investment in Build to Rent, including the Montague Review of barriers to institutional investment and financial support through Homes England (formerly the Homes and Communities Agency) (Rugg and Rhodes, 2018).

By 2014, the financial press was identifying the potential for investment in rental housing to emerge as a significant asset class in its own right (Pickford, 2014), and trade bodies began to advise the industry on the potential investment opportunities. This advice included developing an understanding that the financial returns from Build to Rent are very different to those from

conventional build to sell, in which capital is tied up for a much shorter period until the units are sold. In Build to Rent, capital may be tied up for as much as 30 years, with the primary return coming from the rental stream, requiring a different source and type of investor (BPF 2015).

This shift in the type of investor, and its implications, was pursued by other commentators, for example advocating the creation of a separate planning Use Class for Build to Rent developments, the specific allocation of land for Build to Rent developments, greater flexibility in design standards, higher densities for Build to Rent schemes, and the need for reasonably short covenants in order to enable investor exit through sale (Lichfield, 2016).

The role of housing associations as both long term landlords and developers, with an increasing development pipeline of schemes for sale or market rent intended to cross subsidise social housing, was also recognised as a potential element in the development of the Build to Rent market (PWC, 2015).

By 2017, more detailed advice began to be available, directed at potential developers, managers and investors in Build to Rent. The British Property Federation published a detailed guide entitled 'Unlocking the benefits and potential of Build to Rent' (BPF 2017), while London Councils published guidance for local authorities and others, entitled 'Everything you need to know about build to rent in London' (London Councils, 2017), and the House of Commons Library was able to issue a Briefing Paper, 'Building the new private rented sector: issues and prospects (England)', reviewing government initiatives, institutional investment, individual landlords and social landlords' private rented sector initiatives (House of Commons, 2017).

The most recent data on progress in the Build to Rent market is published by the British Property Federation in an online quarterly 'Build to Rent Map of the UK' at: <https://www.bpf.org.uk/what-we-do/bpf-build-rent-map-uk>, which shows that at Q1 2019 there were 30,357 Build to Rent units completed, with 37,549 under construction and a further 72,184 with planning permission: a total of 140,090 units. Just over half (53%) of these were in London (73,974 units), with 47% in the rest of the country (66,116 units).

2.6. The emergence of co-living

The broad category of Build to Rent contains within it a number of sub-categories, or niche products, of which the largest is Purpose Built Student Accommodation (PBSA).

An emerging category within the Build to Rent market is that of co-living schemes. These offer en suite bedrooms, usually with minimal cooking facilities, in apartment blocks containing a range of communal facilities for use by the tenants, together with onsite management providing concierge services and organising leisure activities. The target audience is generally single professionals, mainly within the 22-35 age range, but with a proportion of older tenants.

There are a number of precedents for the co-living concept in the USA. A typical example is Star City², which has developed a number of apartment buildings in San Francisco and Los Angeles, offering a similar mix of accommodation together with opportunities for socialising with other residents.

The largest and best known developer of co-living schemes in the UK is The Collective³, which has developed a scheme in London at Old Oak with 550 bedrooms, and a recently opened scheme at Canary Wharf with 706 rooms. The Collective describes its aims in the following terms:

“The Collective’s serviced living spaces provide fully furnished private rooms and apartments in some of London’s most iconic locations.”

The Collective’s rental arrangements allow for tenants to choose their desired length of tenancy, but with higher rates for shorter terms.

There are few other schemes currently in operation, but another provider, be:here⁴ has adopted a more cautious approach, offering apartments for rent in blocks with a range of communal facilities. One development in E14 offers 158 studios, 1 bedroom and two bedroom apartments to rent, while another scheme in West London offers 119 1, 2 and 3 bedroom apartments as part of a larger development, with leisure facilities, restaurants and a music venue.

Co-living schemes provide a potential bridge between traditional house sharing arrangements, which provide cheap accommodation combined with reduced privacy, as they offer sociability and human contact, albeit at the possible expense of interpersonal conflict. These themes are explored in a study (Richards, 2013) which examined the experience of house sharing within the theoretical framework of ‘housing pathways’, as an intermediary step before moving on to more permanent and secure forms of living.

Rather than seeing shared housing, or co-living, as steps in a pathway to independence in self-contained housing, other recent commentators have argued for a more general acceptance of sharing as a fundamental, and desirable, element in human inter-relationships, and one of increasing relevance in fragmented societies. A lengthy manifesto, or think-piece, by SPACE10 and Urgent.Agency (2018), ‘Exploring the brave new world of shared living’, offers a vision, together with existing examples of practice, of an increased potential for sharing and community within the

² <https://starcity.com/company/>

³ <https://www.thecollective.com>

⁴ <https://be.co.uk>

context of an urbanised world, and identifies the potential for digital innovation in design, construction and facilities management⁵.

2.7. The space for digital innovation in housing the digital nomad

Analysis of the potential for digital disruption in the field of housing suggests that (using Airbnb as the example), there are five required conditions. The conditions are (i) a diverse, widely distributed source of demand (potential users of short stay rentals); (ii) a diverse, widely distributed and heterogeneous source of supply (bedrooms); (iii) no dominant, efficient mechanism for bringing demand and supply together; (iv) potential financial gains to the demand side, the supply side and an intermediary; and (v) scaleability (adapted from Baum, 2017).

The example of Airbnb has been frequently quoted to illustrate the potential for digital solutions to 'create' supply from existing assets by making it easier to transact.

TechUK, an industry body which works with government and stakeholders, including housing associations and property developers, to develop the connected home market, estimates that the connected home is the largest internet of things (IoT) segment, at seven billion devices worldwide in 2017. Their second report (TechUK, 2018) found that smart devices were most likely to be bought for home entertainment, noting that the number of smart speakers/home assistants doubled between 2017 and 2018, followed by smart devices in energy, health, security/safety and domestic appliances.

However, access to digital technology, and particularly to mobile communications and the internet, remains a relatively expensive investment, and there are concerns that the poorer sections of society are digitally disenfranchised. Only 70% of British adults with an income less than £9,500 per annum have internet access, compared to 98% of those with incomes in excess of £25,000. Research for a major housing association has shown that lower internet penetration is strongly associated with age, declining rapidly after age 45, but among households with children, 91% of social tenants have internet access, compared to 97% of all British households with children (Affinity Sutton, 2014).

There is innovation in the PRS with new services being provided that are able to address issues of access, management and lived experience. Co-living projects use digital technology to help with access, management and lived experience. For example:

- Access: Kin are launching a booking management app tailored for co-living spaces.

⁵ For more information about the potential for digital innovation in design, construction and facilities management, see https://www.cchpr.landecon.cam.ac.uk/Projects/Start-Year/2018/digital_built_britain_housing_network

- Management: At The Collective's Old Oak Common, digital technology is used behind the scenes to efficiently manage the 546 rooms.
- Lived experience: At WeLive, residents are encouraged to keep in touch with each other and arrange social events through the 'WeLive' member app.

Digital technology also offers convenience within the wider private rental sector by providing websites and apps to housemates and landlords. These are designed to help with, for example:

- Access: Housemate searching (e.g. SpareRoom); property searching (e.g. Movebubble); and matching people with houseshares (Wonego uses algorithms to suggest top matches based on data input into the system by users).
- Management: Helping landlords manage properties (e.g. Purplebricks).
- Lived experience: Splitting bills with housemates (e.g. Splitwise); managing chores with housemates (e.g. Roof).

There is also a wide range of property management software available for landlords and real estate professionals to track leases, residents and maintenance tasks, as well as to collect rent and manage finances.

3. Technology providers

The PRS is a fragmented sector, making renting and managing a property a frustrating process for both tenants and landlords. Interviews with technology providers (ideal flatmate, Fixflo, Arthur, Acasa and flatfair) looked at a number of innovations relating to access (to a property and/or flatmates), management and lived experience.

ideal flatmate provides a platform for users to list or find a room for rent, with additional services to help users find flatmates to buddy up with, and new buddy up feature. In the first service, people are able to see rooms listed by private landlords or professional agents and message potential tenants/landlords. The second service allows users to take an optional matching test, and half of the users take the test. The third option gives people the opportunity to express interest in a property and contact flat-hunters interested in the same place.

Fixflo was launched in 2013 to provide repairs and maintenance software for professional property managers. With roots in the PRS, Fixflo deals with both residential and commercial property and now has over 35 per cent of the UK letting agents as clients. Their software suite is designed to make the process of reporting and actioning repairs and maintenance easier for both tenants and property managers by using an online system for tenants to report repairs which are then forwarded to the property manager for action. Around 100,000 reactive repairs are carried out in the UK every month through Fixflo, with 13,500 contractors using the platform in the UK. With the option to report repairs in any of 42 languages, Fixflo guides tenants to the information they need to report a problem accurately, enabling property managers to send appropriate contractors for a first time fix that is cheaper for landlords and more efficient for property managers. Fixflo also supports property managers by scheduling preventative work and compliance reporting, e.g. fire risk assessments and gas safety certificates.

Arthur describes itself as a web-based connective community. Property managers using Arthur are able to connect with tenants and contractors to streamline the tenancy process and property management. Arthur includes apps for tenants, contractors, owners and agents, and fully integrates with online partners, including Zoopla, rightmove and advanced tenant referencing.

Acasa is a digital platform designed to help primarily young people, both students and professionals, to manage their expenditure, but also to absorb the administrative burden of procuring the best deals for utilities as well as splitting payments between home sharers.

flatfair is a deposit-free renting platform where tenants pay a small amount as a membership to the website instead of paying a deposit and the landlord receives protection for up to 12 weeks' worth of damage to the property. Properties offered as 'deposit free' are let around 25% quicker than those requiring an upfront deposit.

Two of the technology businesses emerged from their founders' experiences and frustrations as tenants. The founder of one organisation described his experience of moving:

"Approximately two and a half years ago, I was moving house in London which was quite an expensive exercise. So basically I moved from Pimlico into my new flat near London Bridge and realised that I have to pay six weeks' deposit upfront. I have to pay all the agency fees, which are soon to be banned, which is great, I have to pay one month's rent in advance, all of the moving, it was an unfurnished house and then it took me three months to get my old deposit back. So all of a sudden, I had a massive shortfall. Luckily I had some savings to bridge it but it kind of made me think, what are people doing if they don't have the savings?"

And the founder of another was motivated by his experiences of bill splitting:

"[Business] really emerged out of a bunch of pain that I had on my own journey to renting property. I've rented 18 homes now in four different countries around the world, and I've had my fair share of amazing experiences, and experiences of living with over 50 people. But I have also run into all manner of massive frustrations, including falling out with one of my best friends when we were renting a flat.... and we basically fell out over the bills. So that was probably the biggest single inspiration for building what has become [business]."

3.1. Managing property digitally

Digital platforms initially focused on facilitating easier access to rental properties, but digital technologies are proving to be an invaluable tool for managing the rental itself:

"I think a lot of people have been focused on the transaction, which is the rental or the purchase and sale of a property, which makes abundant sense, right? Because look at Maslow's Hierarchy of Needs, finding shelter, one of the base standards that you need; but, actually, once you've found that shelter, then what?"

Private and social landlords face increasingly onerous compliance legislation as well as a need to demonstrate transparent, accurate costs and pricing to a consumer group with rising expectations shaped by their experience of other online platforms. Technology facilitates this through communication and project management, streamlining all aspects of rental management and reduces costs for landlords:

"We're going to see a much more tech-led private rented sector from search through to deposit lodging, to everything. It will be a tech-first approach with humans effectively doing what humans are good at, which is the relationship parts. So you'll end up with each property manager managing more properties, at least in our particular world, better."

Somebody using [business] for repairs and maintenance is typically able to manage 33 per cent more properties per property manager... We also see that the tenants who are managed by [business] were happier.... you can manage more properties, and you can have happier tenants."

3.2. The digital lived experience

Digital technology has the potential to transform the lived experience in a shared house and the digital applications covered in this study focus on two key areas.

3.2.1. Finding the right flatmate

Finding the right flatmate is crucial to a successful property share, affecting tenants' quality of life through their lived experience. As well as providing listings of properties and people looking to rent, ideal flatmate uses an online 'matching test', a questionnaire designed to help people find compatible flatmates. It is reported that users were twice as happy living in their property if they had used the matching test.

3.2.2. Managing shared financial commitments

Managing shared financial commitments can be challenging for those living in shared housing. Acasa provides an integrated payment platform for core household expenditure, including utilities and TV licence (but not council tax), with each tenant directly paying their share of utility bills and with the option to split other household expenses.

In addition to helping manage household expenses, the platform also helps to find best value, ethical utility providers.

"...our job, as we see it, is to help find the best, most affordable, most ethical providers."

90 per cent of Acasa's users are young professionals with the remaining 10 per cent being students, Perhaps surprisingly, about 50 per cent of the young professionals in shared rental properties were couples, reflecting a trend of couples who do not want shared bank accounts and therefore need other ways to manage their shared financial commitments:

".... young people think that opening a bank account together is a much bigger and more significant commitment than moving in together."

3.3. Building on customer feedback

The interviews identified that acting on client and user feedback plays a crucial role in successful business development in the digital area. This market is competitive and relatively accessible to new competitors, necessitating a focus on ensuring maximum consumer satisfaction to maintain market

share. Furthermore, the digital world is a transparent one with often very public user feedback, meaning that feedback is often determinative:

"This generation is a particularly connected group, and a couple of bad posts on Instagram and you're not going to be surviving as a business for long."

"There are only so many platforms that will offer that sort of service, so if you want to be seen to be doing it correctly, technology will only help."

3.4. Future of Digital Technology in the PRS

The growth in successful, well-known digital platforms, e.g. Amazon and Uber, has raised expectations and consumers expect equivalent levels of speed, simplicity and convenience across their digital experience. All interviewees expressed their intention to develop their business in the PRS by both expanding the variety of services they provide and improving the features of their platforms. It is essential that digital platform providers in the PRS remain up to date with the newest technology:

"If people end up being able to set things up with... their fingerprint on some new kind of technology that we haven't even seen yet, part of our job will be to make sure that young people will be able to do these things through the relevant platforms that exist at any given time."

Fixflo works with contractors and property managers across the UK and consequently they have developed a substantial databank of information on the costs and types of repairs in the PRS. This enables them to publish an annual report on repair reporting and proactive property management in the UK's PRS, identifying industry trends and averages:

"We work and integrate with about 40 different software systems around the world, so the ecosystem or technology stack approach is the only one that I think really works."

Flatfair has built a customer base for its deposit-free scheme and is now integrating this with standard deposit schemes so that landlords, agents and tenants can register deposits and use Flatfair's negotiating platform to negotiate any claims at the end of the tenancy, thus leveraging their existing technology to accommodate more traditional products.

There is no doubt amongst digital providers that the PRS is an area with extensive potential for technological development:

"We're probably going to end up partnering and working with more and more involvement, as well as building out more of our own functionality to solve more of [the problems faced

by tenants]. And I think PropTech is growing again at a pace that the world has never seen. People are predicting that PropTech investment will end up probably matching, or even exceeding, FinTech investment over the course of the next five to ten years."

4. Housing providers

The PRS rental market is changing significantly and rapidly, with technology and digital innovations playing a key role in these changes. To explore how housing providers employ digital innovation in providing accommodation, four interviews were conducted with housing providers. Contemporary co-living schemes provide an alternative to traditional house sharing arrangements but one that is still affordable for 'generation rent'. They employ digital innovation extensively in the design, access and management of co-living accommodation, and as such are a useful indicator for the potential benefits of using digital innovation in other types of housing provision.

Representatives from several housing providers were interviewed:

- The Collective, a series of co-living developments on two sites in London and one in New York.
- Co-living Spaces, a series of refurbished shared living properties in Brighton and Hove.
- Capital Living, a multi-location, co-living community for young professionals in South West London.
- Node Living, a co-living community of boutique properties across North America and Europe, including sites in London, Manchester and Dublin.
- Tipi, a Build to Rent property management company owned by Quintain Ltd., offering accommodation with shared social spaces in Wembley Park, London.

In common with others in the market, these housing providers aim to provide a hassle free route to renting, with an emphasis on 'plug and play' renting. Primarily aimed at young professionals, they provide quality shared social spaces that foster social connection and encourage a sense of community among residents:

"Living as a service, is more than just a property and it entails anything, and everything associated with home life. If you think about the house being the central point in people's lives, it makes sense that all these things fit into that... you've got the kind of sharing element of living as a service, which has now kind of been coined co-living."

4.1. Target market

For many young professionals, the desire for more communal 'student living' does not end when they leave university. With a new generation of students accustomed to high-spec private rooms, en suite bathrooms, spacious communal areas, equipped with high-speed Wi-Fi, expectations of renters are high, but are constrained by housing availability and affordability. Potential tenants are often relocating to a new city for work, and such specialist housing providers aim to provide 'curated living' with a streamlined approach to the tenant journey by offering deposit free renting, stylish fully-furnished apartments, rents inclusive of utilities and cleaning, and high quality facilities from gyms to concierge services - all with a ready-made social life:

"As a population increases, as this housing crisis probably doesn't get any easier, shared living has an important part to play in any urban environment. Because the only way we're going to solve housing is through creative uses of density... Target market, they're moving into co-living because it provides a social environment to meet people. And they move into it for two reasons, and, firstly, social; but, secondly, cost point as well."

"... there's a whole segment of the market that sits between traditional purpose-built student housing and a private rented sector product that's either been fragmented buy-to-let properties or large apartment blocks by PRS operators, private rented sector build-to-rent operators. So that's where this whole movement has come with the idea of connecting people and what we call curated co-living, which is not quite a student feel, but not quite you're on your own in a private rented sector flat, it's a bit in between."

With the exception of Tipi, which has a broader client range, the target audience of these companies is young professionals between the ages of 21 to 40.

"I think there is a misconception that the lettings market is made up of people between 21 and 30, and that are renting before they buy. But who are we typically attracting? Our largest age range is between 25 and 45, and the majority of those people are probably commuting into London for work."

Some co-living providers do not house any students, but working professionals:

It is essential to think about people who have job, but they can't afford to live alone.

4.2. Use of technology

The interviews show that technology and digital innovation is helping housing providers to deliver a different to costumers. One housing provider described how they make use of technology in the entire process, from advertising property to viewings :

"Connecting with the customer and then understanding their needs, and then booking them on a tour, and then possibly they come back for a second tour. So that technology needs to support that entire journey right from the moment that somebody enquires, so the technology is hugely important".

Both Node Living and Capital Living offer a 'curated living' concept with a streamlined approach to the tenant journey, something that lends itself to digital technology:

"We've built our own proprietary software... all tenant on-boarding is digital... and then reporting issues in the property is digital."

We have an app that, once people become a resident and move in, everything's there digitally. So if they need payments, checking their account balance of what they've paid or didn't pay, what's due, all the things you need to do for maintenance, also ... what's going on and events, etc."

Node Living uses digital technology to screen potential residents, potentially match them with roommates or flatmates and to provide a seamless digital process of credit check scoring. Along with the traditional way of property viewing, they offer virtual tours to enable people to view a flat without having to visit it. In the Node Living building, smart access control technology is employed to enable tenants to use their phone to get in the front door and then into the individual units, in case they get locked out of the building.

4.3. Use of data

Following the success of digital platforms such as Amazon, housing providers are trying to use data to build customer profiles to understand and meet customers' preferences and to offer interest-based products. Developing such products requires collecting personal data from current or prospective customers. All housing providers declared that they never share data with third parties and that they only use data to be able to serve their tenants better. However, interviews with tenants showed that accessing customers' personal data is one of the most controversial issues that makes consumers worry and prevents them from using digital tools and sharing data.

One housing provider explained how they use the data of users to improve their services:

"Ultimately, as an organisation, what it's doing is it's giving us data and we can use it to help improve what we do, which, therefore, means we can make a customer's life easier. Which means, actually, we've got a new building coming up which has got everything that they might like, maybe we should talk to them about it. So, yeah, it's a bit like what Amazon does, I suppose, it's always profiling, isn't it, and letting you know what else you might like."

One housing provider stated that they put sensors in their building to find out who uses the residents' lounge and to monitor when are people in and out:

"We're starting to use very basic big data stuff that just gives you a little bit more of a sense of the use of the building and tracking the number of packages that come in, and things like that, that just help us serve them better. We obviously track maintenance data."

4.4. Social events and shared spaces

One housing provider offers a lot of shared spaces such as a terrace and pool table room and organises events which can be found on their residential portal. Residents are able to renting a shared space for a personal event by paying between £40 and £100 for four hours. There are several events held in the shared spaces such as quiz nights, cinema nights, beer and movie nights and bingo nights.

One housing provider provides work stations in the individual rooms, but found that tenants do not really want to work in their room and prefer to have a social space in which to work. Therefore, they designed a lot of seating styled similar to a coffee shop. The founder described it:

"People just like spending time in these spaces. Because they're really nice, inspiring spaces and we've spent a lot of time designing them, people enjoy taking it... They don't want to sit in their bedroom with a laptop, they'll go and sit in a social space and use them to exactly what they're designed for, which is good."

One housing provider mentioned that young professionals do not like to share a kitchen or bathroom or living room in a very large building, which we also found in interviews with tenants. However, they do like the idea of having a shared space in which to watch a movie together or to have a drink with other residents.

4.5. Feedback

Customer feedback is invaluable for housing providers looking to improve or extend their digital offering. Different approaches were adopted by the different housing providers. For example, one housing provider surveys tenants throughout their tenancy, including a post-move in survey, a mid-term survey, and an exit survey. The data collected are used to inform their understanding of tenants' experiences across the whole lifecycle of their tenancy. Another housing provider collects data on their tenants' experiences:

"We'll send out surveys to everyone in our database, and then ask them a set of questions: what was the most important reason that you decided to buy, decided to rent this property,

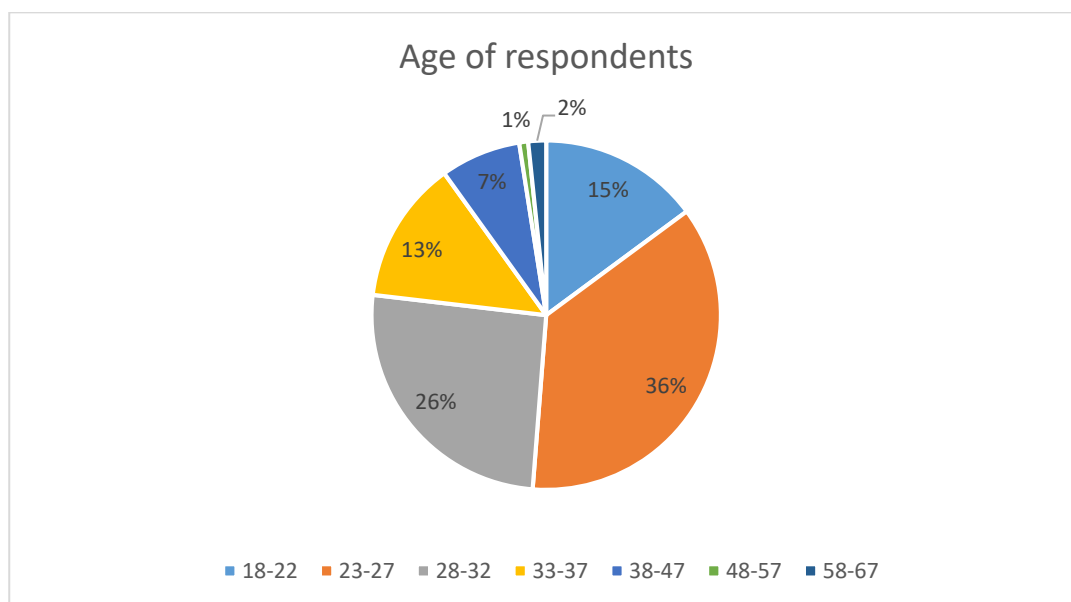
was it...? And can you list in order what facilities are the most important to you when you're renting a property, what location? We try to gather a lot of data that way."

5. Tenants in the PRS

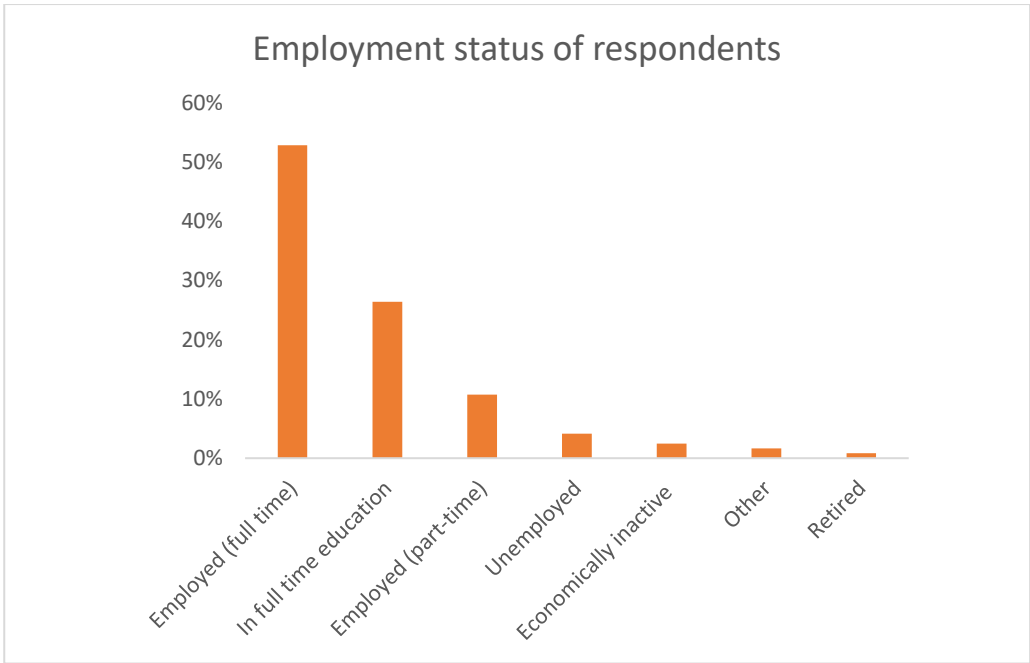
As part of the research, a survey was distributed to tenants to explore their views about renting and digital technology. A total of 125 respondents participated in the online survey, which was disseminated through various housing websites and via social media. Of the 33 respondents who expressed a willingness to participate in a follow up telephone interview, only 13 responded and were interviewed. This section reflects on the views and experiences of tenants who participated in the research.

5.1. Survey respondents

The majority of respondents were aged 27 and under, with 23-27 years old being the largest age group represented (36%):



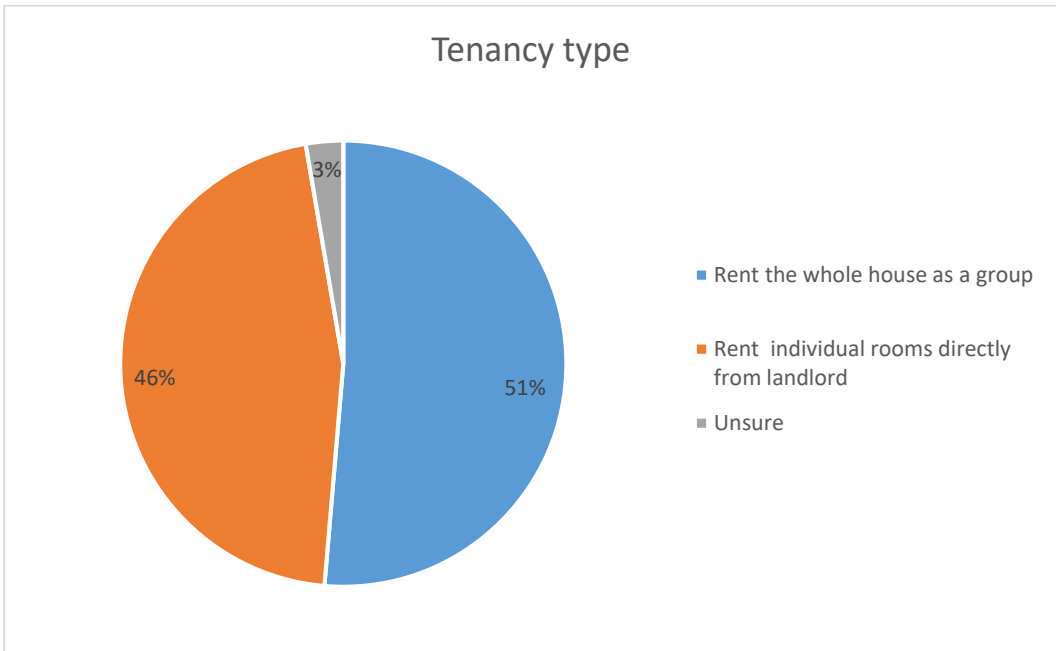
Over half were employed full time (53%) and a further 26 per cent were in full time education:



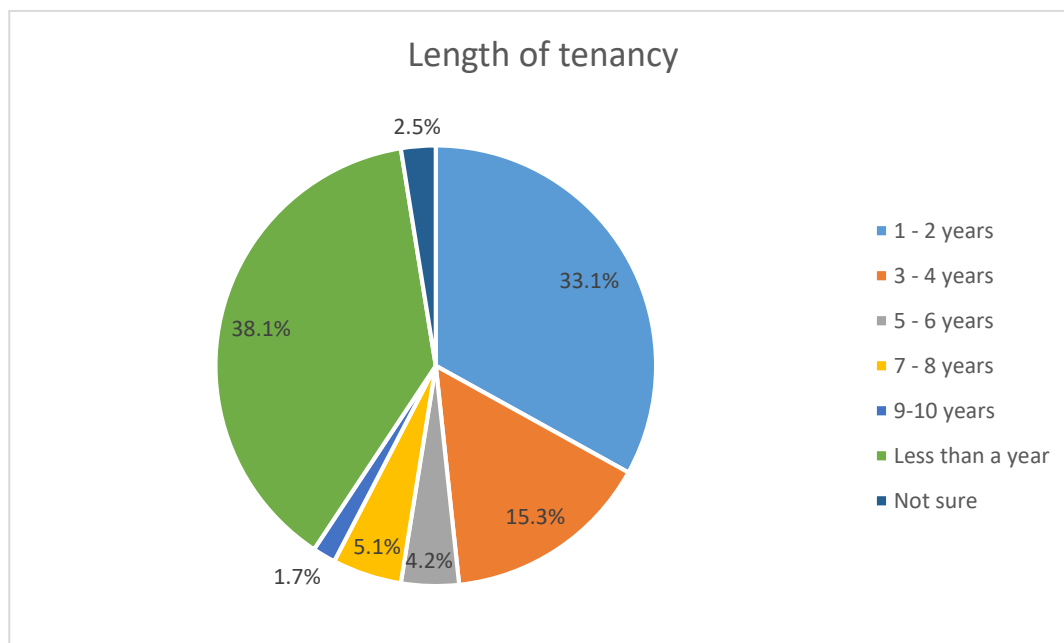
The findings of the residents' survey aligned with the findings of the literature review regarding the mobility of those living in the PRS. The majority of the sample had lived for less than one year in their current accommodation, and, according to the interviews, the PRS does indeed offer 'generation rent' the flexibility to move for employment.

5.2. Tenancy

The survey sample was fairly evenly split between respondents who individually rent a single room directly from their landlord and those who rent a whole property as a group:



Almost 70 percent of respondents had lived in their current property for two years or less:



5.3. The tenant journey

5.3.1. Finding a place to live

Almost all interviewees used websites to find their current property and found it a very good way to find a suitable place to live. Their responses suggested that online platforms have transformed the property search into an easy and effective process:

“You get a lot of information online, and you just have to search for it, so it makes comparing the same properties easier. And you can get everything in one place usually, not like going through newspapers and all those things”

96% of respondents had used websites or apps to search for a rental property, with Rightmove and Zoopla being the most popular sources of information when searching for property to rent:

	Knowledge of platform	Use of platform
Rightmove	89%	61%
Zoopla	78%	52%
Movebubble	9%	22%
SpareRoom	50%	11%
Gumtree	48%	12%

None of the interviewees had made decision to rent a property solely on the strength of a virtual tour. Whilst they said that a virtual tour is helpful, particularly for groups looking for a house to

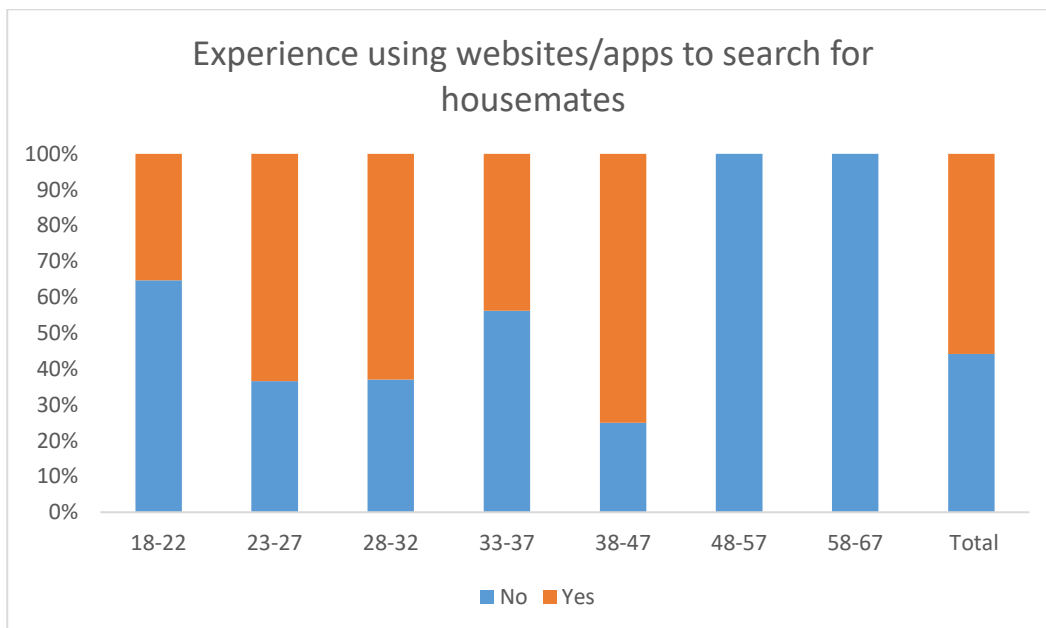
share who may find it difficult to arrange a viewing slot suitable for everyone, it was not a substitute for a personal visit. They believed that in order to make a final decision, it is necessary to visit the property in person:

"I'd always much prefer to go and see something physically but it does help when you're in the process of looking for accommodation to decide which to spend time going to look at. That tool is useful but it's always better to just personally go and see it, to get to understand what the houses nearby are like, what the area's like, is it noisy, is it smelly, is there a factory nearby, or a food shop that's smelly?"

5.3.2. Finding a housemate

Respondents who were sharing their house were asked how they met their current housemates. For the majority, people were living with existing friends or friends of friends. However, 23 per cent were sharing with people who they did not know prior to moving in.

More than half of respondents overall had used websites and apps to search for housemates, although this varied somewhat across the different age groups, being more common amongst younger respondents:



Respondents were asked to rate the usefulness of the websites they had used, and the relatively low 'very helpful' scores probably reflect the new and emerging nature of this type of service:

Website	% used	% rated very helpful
SpareRoom	78	47
Ideal Flatmate	14	38
Easy roommate	23	9
Gumtree	56	21
Roomsters	14	0
Roombuddies	16	11
Badi	11	17
Kangaroom	3	50

5.4. Lived experience

This section explores the extent to which tenants use technology in their home and to what extent their lived experience is affected by digital innovation.

5.4.1. Motivations for sharing

There are many determining variables behind the preference of people for living in a shared house, including, relationship status, personality and financial status. Shared living is not for everyone, but even for those who do share, it can be a less than sociable experience:

"I don't like to talk to anybody when I back home, 10 words a day is more than enough."

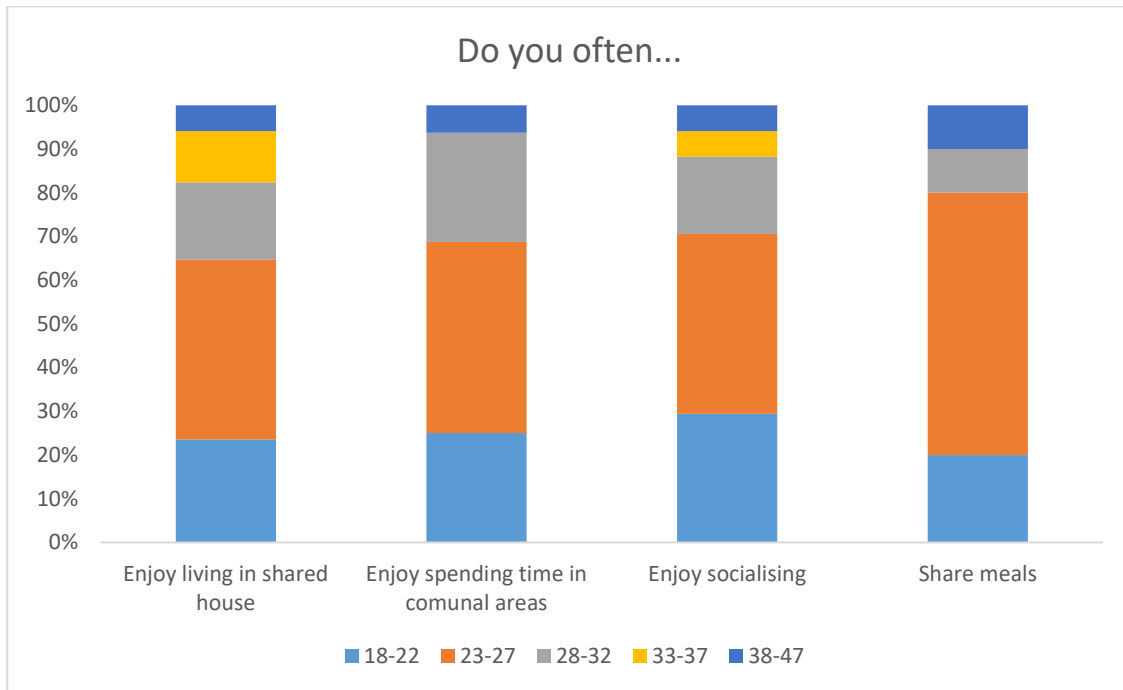
When asked why they lived in a shared property, respondents frequently cited money-related reasons. Overall, 83 per cent of respondents gave at least one finance-related reason, with 54 per cent of respondents giving at least one social-related reason:

Reason for sharing	Type of reason	%
All I can afford	Financial	32
Enables me to live in a better location than if I lived alone	Other	24
Enables me to save money towards a deposit for a property	Financial	6
Enables me to save money towards something else	Financial	7
I enjoy the social aspect of living with others	Social	21
I would be lonely if I lived alone	Social	10

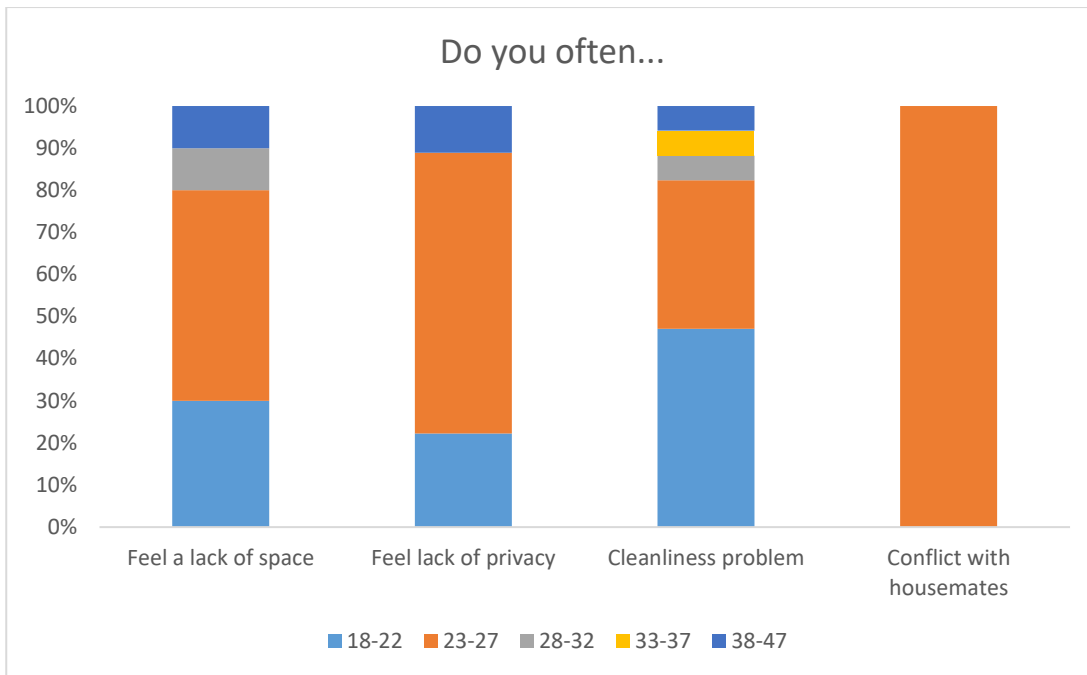
5.4.2. Positive and negative aspects of sharing

Respondents were asked what they liked about shared living, and younger respondents were generally more positive about sharing. For example, 60 per cent of people who liked sharing meals were age 23 to 27:

“Company, shared likes, having a family feel away from your direct family, those sort of things.”



Conflict with housemates was cited as a negative aspect of shared living for many, with a lack of privacy and space also being concerns:



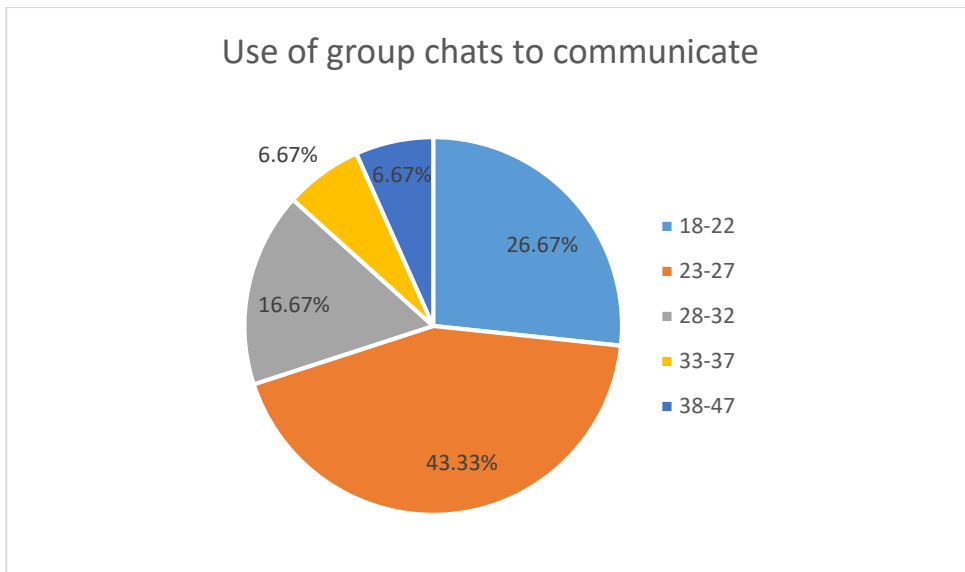
5.4.3. Using technology

On average, only 20% of respondents had used websites or apps to split household expenses with their housemates:

Age group	No	Yes
18-22	78%	22%
23-27	68%	33%
28-32	82%	18%
33-37	100%	0%
38-47	100%	0%
48-57	100%	0%
58-67	100%	0%
Grand Total	80%	20%

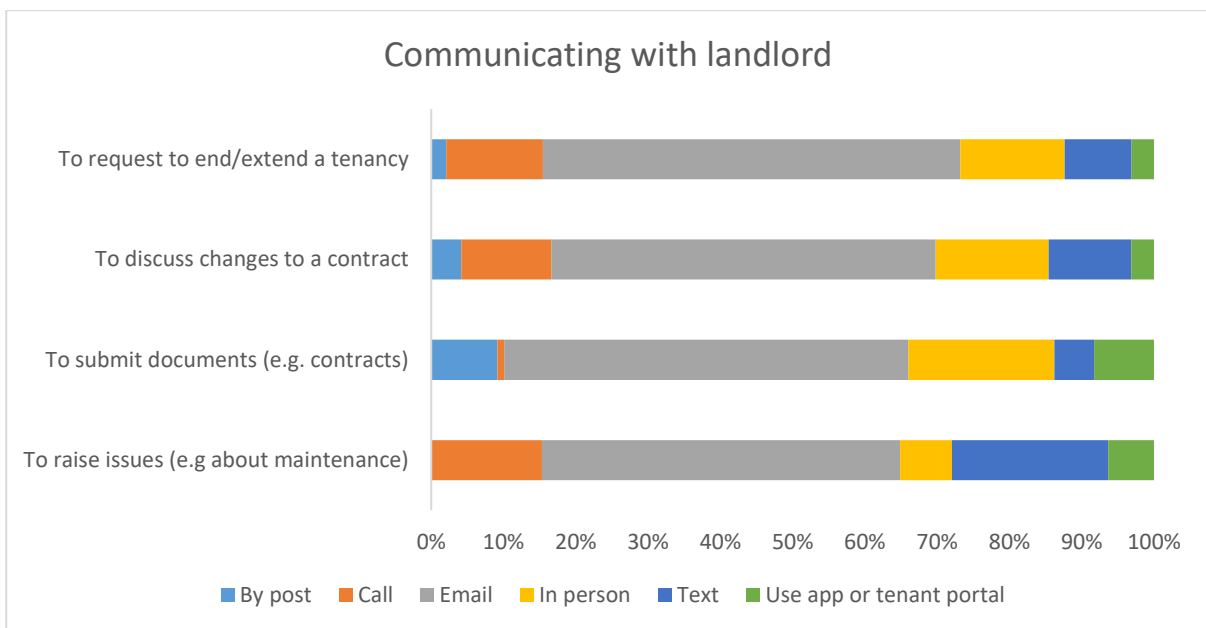
Respondents were also asked if they had experience of using websites or apps to split chores with people they live with. In total, fewer than 7% of respondents had done so.

On average, 23 per cent of respondents used group chats to communicate with their housemates. The following graph shows that younger age tenants were more likely to use group chat apps to communicate with housemates:



5.4.4. Communicating with landlords

The chart below shows that email is by far the preferred method for communicating with landlords:



Overall, tenants reflected that using email and text to communicate with their landlord or lettings agency work well for them, but when asked whether they thought that using technology could improve communication, they agreed that it could make the process easier. However, issues of trust, convenience and traceability seemed to be behind this preference for email communication:

"Emailing people is one of the quickest ways to do it. In an application I would never know when someone is going to actually look at my issue. I don't know, I wouldn't trust it as much as I would in just a simple email."

It was noted that the success of using an app or tenant portal would be dependent on the responsiveness of the letting agency, landlord or property manager, and that in turn would depend on the technical resources engaged by the letting agency, landlord or property manager:

"I would not trust it unless the application generated an email to confirm I had logged an issue."

However, one of the advantages of using a portal or an app to report a problem to the landlord would be date stamping, allowing traceability:

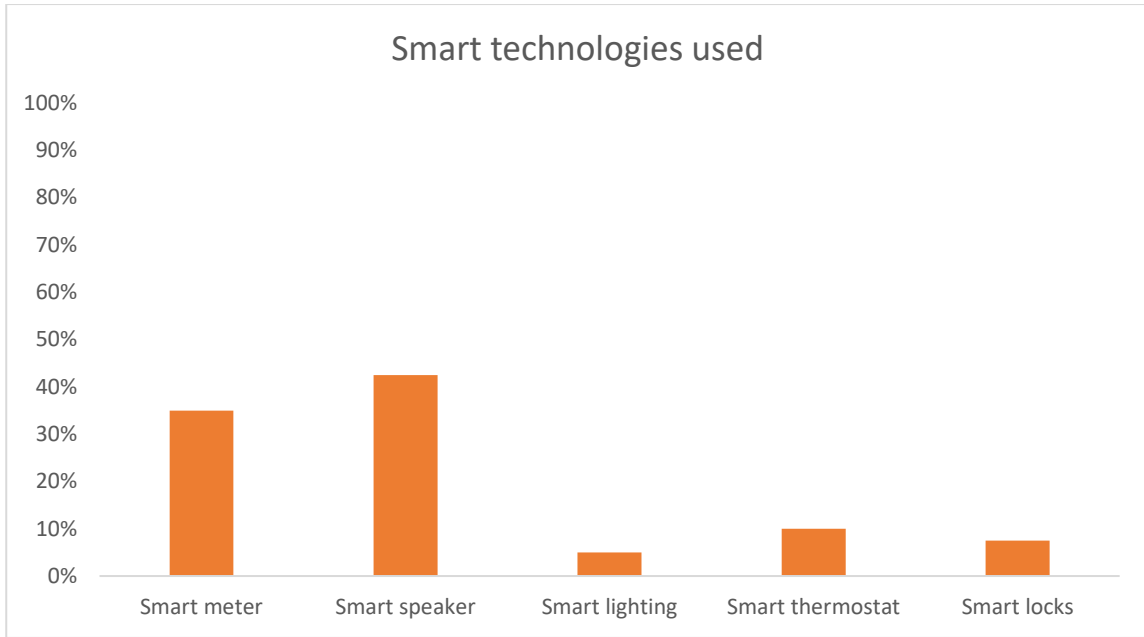
"... so when you raise an issue, it says you raised it on 4th June at this time, and it shows if the landlord's taken two weeks to fix it, you can prove that."

Despite not having heard of resident portals, the interviewees found the idea exciting when it was described to them and acknowledged the potential usefulness, particularly in relation to local business offers and discounts, or as a place to store and access tenancy documentation. Using a residents' portal as a means of connecting with other residents was also an attractive prospect:

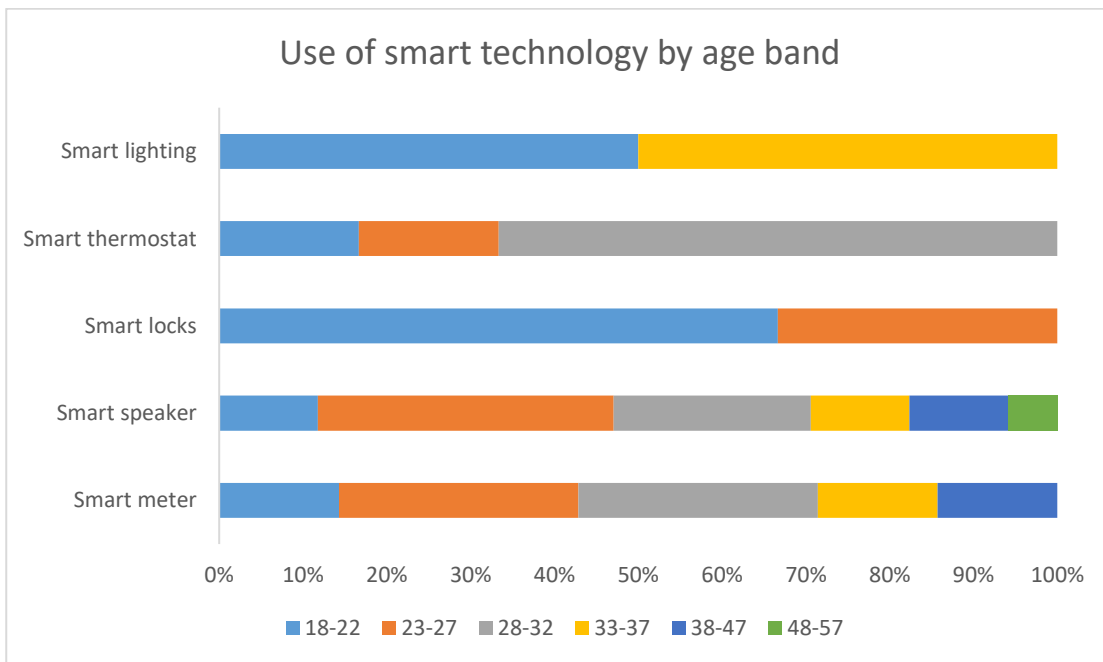
"I quite like that idea because we've moved to a new place and we don't really know anybody in the town. So if there was an opportunity to go to events to meet people or events wider than our building, I'd definitely be interested to know what was available to build a community feel. So, yes, I'd like that."

5.5. Use of smart technology

Respondents were asked whether they use some form of smart technology at home. As shown in the chart below, smart meters and smart speakers were the most common forms of technology with much smaller proportions using smart lighting, smart locks or a smart thermostat:



Smart technologies such as smart lighting and smart locks were used predominantly by younger people:

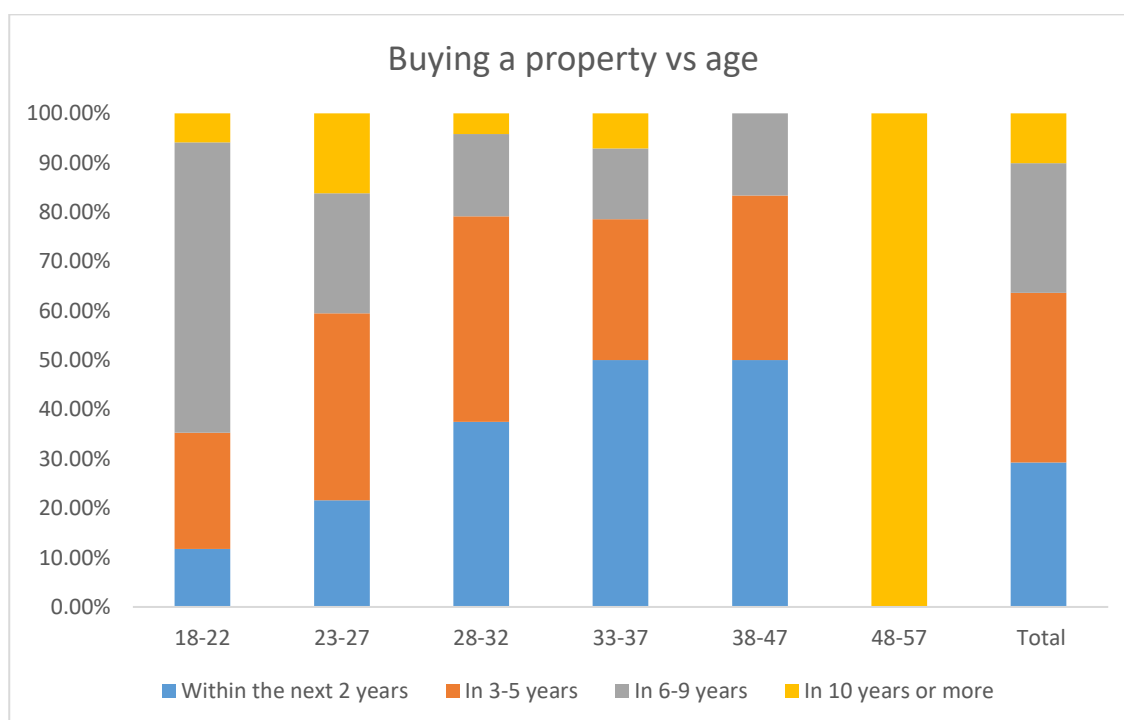


5.6. Future housing aspirations

When asked, the majority of respondents said that they would like to buy their own property, and this was split relatively evenly between those who would definitely buy a property (49%) and those who said they will "probably" buy.

Intention to buy a property	%
Definitely yes	49
Probably yes	37
Probably not	4
Definitely not	3
Unsure	7
Total	100

60 per cent of all respondents planned to buy a property within the next five years, with nearly 50 per cent of respondents aged 33 to 47 having plans to buy a property within the next two years. The youngest band of respondents (age 22 and under) preferred to continue renting a property:



5.7. New models of renting

None of interviewees had heard of co-living communities, and after the model was explained to them, were still not very keen on the idea of living in a co-living community. Many interviewees said that co-living reminded them of student living, and commented that this was not something they would like to return to. However, they did acknowledge its advantages:

"Yeah, it does sound quite interesting. I would definitely be interested in one if I was living by myself. Now I have a girlfriend but before I was definitely looking for more social aspects in my life."

"It wouldn't appeal to me now but I think if you've just moved to an area and you're in your early 20s, it might be quite a good idea It's maybe cheaper than other places, and it would mean that you get to mix with lots of different people and make new friends. But it wouldn't be something I'd be interested in."

5.8. Adopting digital technology and innovation

The interviews explored residents' attitudes to the use of technology and found that they fell into three areas: knowledge of smart technology, willingness to engage with smart technology and privacy issues surrounding the use of data.

Respondents were familiar and comfortable with some digital platforms, notably property search websites and smart home technologies:

"Actually I'm not against how technology can do things for me without me really having to think about it, and I think it's already doing it in many ways and I'm just not that aware of and if it stopped, I would probably be irritated."

Interviewees expressed concern about the use of data collected by smart technology, including third party use, and the potential for systems to be hacked:

"It is so easy to be hacked I have tried it ... and it took me 35 minutes because I have never done it before. And I am not an incredible hacker or whatever, I am not even a computer person. I looked online how to do it, and I have had it happen. It means that anyone can access whatever I am doing that way, and I am not comfortable with that."

Disposition perhaps also plays a role in the inclination to adopt smart technology. Some of the interviewees said that they were not "technologically minded" and would only use digital tools if they helped to reduce costs:

"I'm not a particularly technology minded person but maybe something to just help us save money something that saves me money, I think, more than anything".

Overall, the tenants interviewed found both positive and negative aspects to both sharing in the PRS, and to the use of digital technology in their tenancies. Sharing and renting in the PRS was predominantly a decision driven by cost, and whilst there was a recognised value in the social

aspects of sharing, there was also conflict. Most renters interviewed aspired to purchase their own property, rather than to remain renting indefinitely.

Most renters interviewed were familiar with the digital services available to find a suitable property and found these unproblematic to use. However, once living in a rental property, most preferred to communicate with their landlord via email rather than through an app or online portal, although they did use apps to communicate with housemates. This did not extend to using apps to help share living costs or chores. The main barrier to wider use of digital technology by PRS tenants identified here was concern about the privacy issues surrounding the use of their personal data, and lack of evidence of the personal benefits of using such digital technologies.

6. Conclusions

This research has identified that there is considerable digital innovation in the PRS, with new services being provided that are able to address issues of access, management and lived experience. Digital technology offers convenience and lower costs by providing websites and apps to housemates and landlords. There is a wide range of property management software available for landlords and real estate professionals to track leases, residents and maintenance tasks, as well as to collect rent and manage finances.

Digital platforms were initially focused on facilitating easier access to rental properties, but digital technologies are proving to be a useful tool for landlords to managing the rental property itself. This should mean that, as the sector develops, a single landlord is able to manage more properties, and to provide a more efficient service at a lower cost to tenants.

Digital technology has the potential to transform the lived experience in a shared house, although the research suggests that this is as yet under-developed. Finding the right flatmate is crucial to a successful property share, affecting a tenants' quality of life, and managing shared financial commitments can be challenging for those living in shared housing. However, the use of digital technology to find a flatmate or to share household bills is not yet the norm.

The interviews identified that acting on client and user feedback plays a crucial role in successful business development. This market is competitive and relatively accessible to new competitors, necessitating a focus on ensuring maximum consumer satisfaction to maintain market share. This is an area of fast-paced technological change, and digital platform providers in the PRS have to remain up to date with the newest technology.

As described earlier, analysis of the potential for digital disruption in the field of housing suggests that there are five required conditions. The conditions are (i) a diverse, widely distributed source of demand (e.g. potential PRS tenants); (ii) a diverse, widely distributed and heterogeneous source of supply (e.g. rental properties and rooms); (iii) no dominant, efficient mechanism for bringing demand and supply together; (iv) potential financial gains to the demand side, the supply side and an intermediary; and (v) scalability (adapted from Baum, 2017). All of these conditions exist within the PRS. Technology and housing providers are beginning to exploit the opportunities of wider use of digital technology in the PRS.

However, although the research suggests that the PRS is an area with considerable potential for technological development, the use of digital technology in the PRS is still emerging and is not yet fully embedded. Both tenants and landlords are comfortable with using digital platforms to advertise and rent a property, but the use of such technologies to facilitate property management or to support shared living, is not yet as common or well developed. For tenants, the biggest

concern about making greater use of digital technology relates to privacy issues surrounding the use of their personal data.

There are two different groups to consider in the adoption of digital technology in the PRS. One group is the technology providers, who seek to use data and digital innovation to deliver new services and to create new markets. The challenges faced by this group are mainly technological, but also include the challenges of marketing their products and services to end users. This is a rapidly developing market and there are multiple providers competing with similar products. The second group are end users, both landlords and tenants, who are engaging with digital services to advertise/access rental properties, and to manage and live in them. For end users, the barriers to adoption centre around the ability to generate efficiencies and cost savings, lack of knowledge of services and products, and issues surrounding trust and data privacy. Further research could focus on several areas, and strategies to overcome the barriers to greater digital uptake amongst different types of landlords and tenants is one clear area for further research.

One area for further research is digital exclusion, which is often invisible and misunderstood. It tends to be considered a challenge only for older people, but research shows the extent to which young and working-age adults can also be digitally excluded (Burgess and Quinio, 2019). Digital exclusion “involves the unequal access and capacity to use information and communication technologies that are seen as essential to fully participate in society” (Martin et al, 2016; Schejter et al., 2015). If the PRS continues to grow as forecast, and increasingly houses low income households, whilst at the same time access to housing and housing services is online and digitally enabled, there is a risk that certain households will be excluded and disenfranchised.

Research needs to explore the issue of fear about sharing data, and the ethics of data collection and data governance. These fears currently represent a barrier to wider use of digital technology in the PRS. The barriers to adopting technology and digital innovation by residents as end users falls into three main areas: knowledge of smart technology, willingness to engage with smart technology, and privacy issues surrounding the use of data. Although respondents were able to identify the benefits of using digital platforms and tools, they were hesitant to use them because of issues of lack of trust and data privacy, and unless addressed, this will hinder the uptake of digital technology in the PRS.

7. Acknowledgements

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