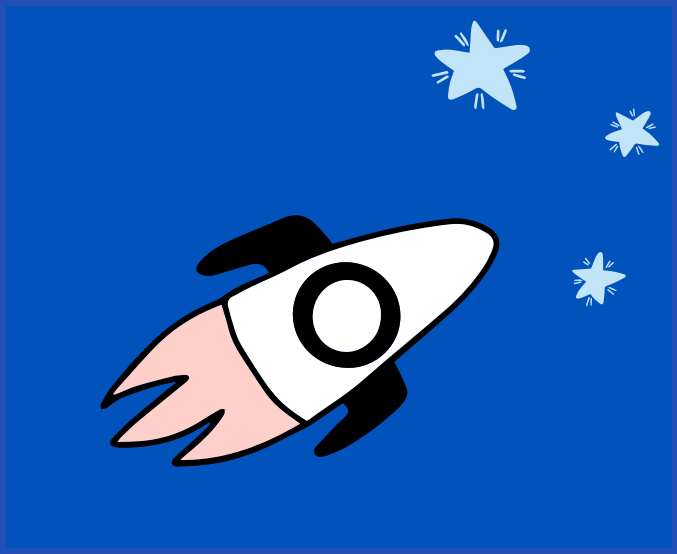


Digital Property Market Steering Group (DPMSG)

Data Standards & Interoperability

Analysis of data standards, services & governance within the property buying and selling system

A report by TPXimpact

Spring 2025

Introduction

This independent report explores the status of open data standards and services in the property sector in England and Wales today. Included in scope are three key critical factors: Data standards; Data services; and Governance. The needs of both residential and commercial land and property are considered, though in practice there are few differences as both share the majority of the same requirements from transaction and ownership perspective and where that is the case, digitalisation and open data standards would benefit both. The main differentiators between the two are the complications of limited personal finance, the need to reside somewhere, and storage of household goods that lead to chains of inter-dependent transactions.

Our research indicated there were minimal differences to the property purchasing process in Wales, and that most of the legislative differences regarding property law affect the rental market. The primary differentiator for transactions in Wales stems from the need for all official documents and processes to be available in English and Welsh. Therefore, professionals operating in that market need to translate between English and Welsh and do so for their clients. Scotland has its own separate legal system which includes different procedures for buying and selling property with the Scottish Registers forming their cadastral system. A review of the Scottish property market was however conducted as part of our investigation into other territories.

Areas of interest and best practice from overseas jurisdictions and other sectors, such as the financial sector have been investigated.

What is standardisation?

Standardisation is the process of ensuring things of the same type share the same properties, such that undesirable variation, qualities or events are reduced to acceptable levels. Standards can be set and applied to almost anything, from the technical specifications on devices such as USB-C, and efforts to ensure that becomes a common charging standard across the EU, to ensuring people meet required professional standards, such as being a qualified conveyancer, to ensuring that a person follows a process that is designed to yield outcomes of a specified quality. In this example that process might be the code of practice for signing and exchanging property contracts with the outcome that the chances of those signatures belonging to persons other than the rightful parties is very low.

Processes in general can therefore be used to create standardisation and quality, in the artifacts they produce. By reducing variation, standardisation inevitably enhances interoperability. Data services typically embody a form of process standardisation that often helps to reduce variation and costs further by eliminating repetitive work, whilst increasing the speed at which tasks can be performed through automation. A data service need not be purely about automation, often they will form part of a broader process including human interaction, or facilitating people to perform a task such as visualising the boundary of a

property title, augmented with local authority data, to determine whether a property is in a conservation area or not. Interoperability, workflow, and connectivity of these services can then be improved by integrating data standards across specific interfaces or fields.

When we use the unqualified term “standards” or “standardisation” in this report, we are typically referring to both data standards, and standardisation through services collectively.

Demonstrating adherence to a standard often confers an element of trust, so signs, seals and accreditations are often granted to individuals or organisations by trusted authorities as a means to verify and support their claims through the maintenance of licensed or accredited membership lists. These patterns of governance and enforcement themselves then create an additional layer of standardisation and trust.

Data services, open standards and governance unpacked

Data services provide the processes surrounding the creation, access, movement, and transformation of data and therefore facilitate the operational aspects of business processes such as property transactions. In a complex process such as purchasing a property, a data service will typically only cover and automate a small part of the process, such as the submission of a transfer of title to update the register of titles via HMLR’s Digital Registration System.

Data services will typically interact with humans and other services, and bring structure, consistency, and automation to a process, and are often a vehicle through which other regulatory standards and guidelines can be enforced. Frequently, data services will provide Application Programming Interfaces (APIs) to facilitate automated exchange between systems. In turn those APIs may implement access standards such as OpenAPI schemas, which integrate documentation, with API and data schemas that describe in a machine-readable format the API and its surface area.

“Open data is data that anyone can access, use, and share.
Open data must be licensed.”
Open Data Institute

Since the 2012 Open Data white paper[1], the government policy has been for public sector services to operate under a policy of “Open by default”. Open Data is believed to increase transparency, trust, and accountability in government services, whilst also leading to improved and often unanticipated economic outcomes through innovation on top of that data. Open Data is data that is published under an Open Licence. There are broadly two types of open licence, permissive licences, and copy-left licenses. Permissive licenses allow data to be combined, mixed and enhanced with few obligations beyond attribution be placed on those doing so. They therefore enable businesses to resell the data combined with added value data or services. Copy-left, or “share a like“ licenses are less common in the Open Data world, as they include a provision that remixed versions of the data must also be made available under the original copy-left licence. Copy-left licences are often considered “viral” as any remixing forces more data to be opened. This virality typically prevents users

[1] Open Data: unleashing the potential - GOV.UK

remixing and redistributing the data with licensed proprietary data. For this reason, the Open Government Licence (OGL) is typically preferred by government and industry to enable and encourage commercial use without fear or favour.

"Open standards for data are reusable agreements that make it easier for people and organisations to publish, access, share and use better quality data."
Open Data Institute

Not all data can be open, as much of it contains sensitive or personally identifiable information, whilst other datasets and services may be commercial or have licensing restrictions that limit its use to defined contexts. In these cases, authentication, and authorisation standards such as OpenID and OAuth become important as a means of ensuring users are who they say they are, and that they have the right level of authorisation to access the data. In a mature system involving many actors both data and access standards work together to make the service easier to access, use and understand. The Open Banking Smart Data Scheme provides a good example of what can be achieved, through legislation, governance, and a sector wide commitment to a rigorous standardisation effort. This is expanded upon later in the report.

Often the same data is needed multiple times, or by multiple parties throughout a process. For example during a property transaction, at exchange of contracts, the buyer, seller and mortgage lender, will need to know the completion date, so agreeing to use a common standard for dates[2] and associating it with a field which is widely understood by all involved parties to mean the legally binding "completion date" is one way standards could potentially reduce risk in the transfer of funds and result in a smoother, more automated process. Standardisation such as this could potentially result in fewer errors arising from manual processes performed by a conveyancer copying information from one document to another.

This example also illustrates how standards are frequently reused and can build on each other. The ISO8601 standard for dates is a well-established international standard for communicating date time information within a field; whilst the binding of that standardised "data type" to a field called "completion date" that has a defined and precise meaning in a given context, is another level of standardisation that is typically driven by domain and industry specialists.

Standardisation efforts require investment and can be costly with no guarantee of success or adoption. Additionally, whenever there are shared and vested interests in a complex and competitive landscape, participants in those efforts will want assurances that they retain the rights to benefit from and further develop the standard, whilst some organisations may wish to protect and retain their intellectual property rights.

The governance of organisations developing standards therefore includes the need for them to take a clear position on the rules and expectations around intellectual property rights. They must balance the distribution of rights, for the developers of the standard itself, the implementers of it and potentially even the users of implementing systems. In this context open standards typically mean that the specification of the standard itself is unencumbered

[2] such as the ISO8601 standard for date and time

with intellectual property rights, and that the standard may be freely implemented by anyone, without either the implementer or final user exposing themselves to any risks associated with intellectual property infringement[3].

There is sometimes nuance around openness in standards, for example the International Organisation for Standardisation (ISO) typically produce unencumbered standards, so implementers of many of their standards are not usually at risk for implementing them; but the ISO typically charge a fee for certification against the standard, or for accessing the standard documents and specifications. Whilst other organisations such as the World Wide Web Consortium (W3C) or the IETF publish their unencumbered standards for anyone to implement without costs to implementers.

Who is allowed to contribute to the development and future evolution of standards, and the assurances they get through co-designing and participating in their development are important aspects of the governance process that contribute to the maturity of standards organisations and the standards they develop. This is covered in the governance of Standard Setting Organisations.

The other aspect of governance we consider are the wider legislative and regulatory context surrounding the government's wider digital agenda, some of which is embedded within the concept of Smart Data Schemes. This includes consumer rights, and legislation such as the GDPR, eIDAS, and the development of the Digital Identity Attribute and Trust Framework (DIATF). Additionally, we consider the needs for data standards and services to align with existing and future professional standards.

In summary, data services structure the processes around creating, accessing, moving, and transforming data. They often make use of both data and access standards so that other actors can understand and use them, and this supports integration with other services. Adoption of common data standards by different actors and the services they control can support the reuse of data across a process by ensuring that each party agrees on the meaning and format of the data being shared. Governance plays a critical role in the process of standards adoption. Organisations who develop standards can use governance processes to ensure that intellectual property rights are appropriately protected, and that standards are shared at an appropriate degree of openness, each of which has an impact on a standard's potential use. Furthermore, guidance or regulation introduced through professional bodies or legislation can have a significant effect on adoption.

In this report we use the term standardisation to refer to the generic process of establishing standards at any level, be they applied to people, organisations, processes, or systems.

[3] An example of this was with digital audio and MP3 encoders which were patent encumbered until 2017. Free and open-source implementations were available, but distributing MP3s encoded with them required a license and royalty payment.

Why are standardisation and governance needed?

Improving outcomes

The property buying and selling process in England and Wales is widely acknowledged as a complex process, with each individual transaction from listing to sale typically involving at least 8 parties[4], from across the public and private sector. The complexity of the process is compounded by the complex information needs of those involved, who require detailed and accurate information on the rights, restrictions and responsibilities associated with the land in order to support the purchase and lending decisions associated with the transaction. Transactions are heavily paper-based processes with 130 documents[5] being generated for the average transaction.

The transfer process is widely believed to be suboptimal with buyers and sellers experiencing a range of poor outcomes, from brittle transaction chains to large numbers of late stage fall throughs.

There is a broad desire to improve the state of the market for buyers and sellers by improving performance on a number of performance indicators, including:

- Speed of transaction (from initial offer to completion)
- Rate of completion / Fall throughs
- Risk of fraud and data breaches
- Positive user experience improving consumer knowledge and trust
- Fair practices and value to users to the service

Though there is great variation within each, the current process from pre-listing to sale is suboptimal in these metrics. The lack of a well-designed overarching process presents participants with many challenges:

- A lack of verifiable information
- Low trust in data collected from other parties
- Delayed access to required information
- Unstructured data, often in documents
- Technical barriers to innovation
- Chain issues outside of the control of the parties involved in a single transaction
- Inadequate mechanisms for redress

All of which are understood as contributing causes to the following problematic or inefficient processes:

- Double checking & duplication of effort e.g. multiple parties collecting the same information

[4] Actors involved in a typical transaction include Owners, Buyers, Estate Agents, Local Authorities, Estate Agents, Conveyancers, Search providers, Mortgage Lenders, and often many more.
[5] The Smart Data Roadmap: action the government is taking in 2024 to 2025 - GOV.UK

- Sequential approach to transactions, rather than adopting a parallel approach e.g. seller waits for buyer to engage before conveyancing starts
- Sharing copies of documents electronically or via the postal service e.g. hard copy letters rather than sharepoints
- Error prone manual retranscription across documents and forms e.g. errors in boundaries transcribed from historical maps
- Insecure data sharing e.g. photographs of I.D left on unsecure devices
- Criminal behaviour such as fraud and theft of identity, property, and money
- Inefficient communication between parties e.g. clarification of buyer questions
- Limited innovation in buying / selling process e.g. compared with surveyed countries
- Use of gazumping and gazundering compared with foreign markets e.g. compared with surveyed countries
- Delaying sales due to chains / reluctance to sell without simultaneously buying e.g. compared with surveyed countries

Public expectations and concerns for a better process

Information on public expectations of the property buying process, along with the maturity and digitalisation of the sector, is relatively sparse.

However, the Home Owners Alliance publishes an annual report, The HomeOwnerSurvey, with different focus year on year, sometimes referencing process expectations. In 2018 the report[6] indicated that:

- 82% of UK adults supported the idea of a government-backed license for estate agents. This aligns with feedback across the sector from interviewees for this report who indicated greater regulation of estate agents would be beneficial.
- 80% of respondents wanted buyers to demonstrate proof of funds before being able to put in an offer to buy a property. An agreement in principle does have some impact on overall process time.
- 65% of UK adults supported the idea of a reservation agreement requiring buyers and sellers to put down a non-refundable deposit to commit both sides earlier in the process. As discussed elsewhere, there are barriers to uptake on this (a lack of sufficient upfront information to commit to purchase, dependency on a chain etc.)

The 2019 report[7] indicated a concern about Gazumping and Gazundering. In 2019 45% said gazundering is a problem, up 5% year on year.

The 2024 report[8] indicated that many don't understand what services a conveyancer provides. However suggested improvements to the process included themes such as:

- A faster process
- Improved communication, both more frequent, and clearer explanation of legal process and issue
- Better access (times) to conveyancer or case information

[6] The HomeOwner Survey 2018
[7] The HomeOwner Survey 7th annual report
[8] The HomeOwner Survey 8th Annual Report

- Online or app-based access to case information, with potential of prompts for action needed

General consumer digitalisation trends are:

- Increasing use of smart phones and the web has led to an increase in public expectations around the convenience and speed of digital access
    - Trends such as biometric authentication, digital wallets and contactless mobile payments increase expectations.
    - Multi factor authentication via mobile devices, and pass keys increase security of sensitive financial data and expectations around ease of use.
    - Success of Online Banking (and Open Banking) indicates consumers can trust high value online systems, including wide use of online credit and debit card payments via 3D Secure.
- An increasing amount of government services using GovUK One Login, ranging from driving licenses to power of attorney and signing mortgage deeds.
- An increasing distrust and dislike of heavily paper based systems and processes.

Prerequisites for better process

Our research has highlighted there are three prerequisites for innovation in the property market: Trust, Incentives and Digitisation. These enable the parties involved in the process to achieve their activities in an optimal manner for both them and other users, ultimately ensuring mutually beneficial outcomes.

Trust

Trust is a critical factor in the property market, playing a vital role in transactions, data sharing, and overall market efficiency. Trust can take two forms: affect-based (emotional) or cognitive. Affect-based trust is trust that arises from emotional bonds and feelings, often involving affection or a sense of personal connection. It is built through interpersonal interactions, empathy, and emotional experiences. Our research has shown that in other territories with smaller property markets such as Scotland and Norway, there is more personal trust, as conveyancers and those facilitating the transaction will have built trust through frequent interactions and existing working relationships.

Cognitive trust, on the other hand, is formed based on rational evaluations and assurance of reliability, competence, reputation, and a belief in the incentives motivating that party. Cognitive trust can be built in lieu of affect based trust through professional organisations, accreditations, certifications and by ensuring information is authentic and tamper proof. Whilst for consumers and professionals a belief that adequate mechanisms of redress and indemnity exist.

Trust in private companies is required for sellers and buyers to engage with confidence, requiring paying for services at various stages of the journey as well as managing funds. Across various stages parties are required to trust the identity of persons and organisations in the process.

The property market currently functions through an existing balance of trust, mitigations and liabilities which though not designed up-front have evolved to ensure transactions can occur. It is therefore important that any substantive changes to the process are coordinated and agreed upon by the relevant stakeholders.

Retaining and building this trust is a pre-requisite to any change or co-design process such as shaping the standardisation and governance of the sector, and our report highlights the need for trust in the formation of standard setting organisations. We expand on this in the governance of standard setting organisations.

Incentives

The property market is characterised by a large number of stakeholders with vested interests and existing professional obligations. The ways of working of these stakeholders are largely governed by balancing the risks and liabilities of parties to a transaction with their own profit and organisational incentives. In order to participate and support any changes, all actors involved in the current process need to believe the future incentives will be worth their investment in supporting change.

In a scenario when building or adopting new processes increases the benefit to other parties but puts another party at real or perceived risk, said party is unlikely to facilitate or support the innovation.

These increased risks could come in the form of legal liability, or in a form of industry protectionism. Here parties or organisations may, completely rationally, not engage with an improved process if they deem the process may erode their competitive advantage or make them redundant altogether. Another disincentive can also be a status quo bias, where without clear and tangible benefits to the party or organisation, they will maintain their current position. This is particularly the case when there is a little uncertainty about the prospect of improved outcomes as a result of change. It is clear from the research that beyond rational incentives, any movement towards an evolved process must be designed in a manner that makes the pathway to engaging with said process clear, easy and without financial risk.

Digitisation

Digitisation is the first stage, followed by Digitalisation and Digital Transformation. The three terms can be viewed as spectrum, where typically a system sees digitisation as a prerequisite for digitalisation, and digitalisation as a prerequisite for digital transformation, and elements of each can be seen in the recent innovations in the England and Wales home buying process. Digitisation being the converting analogue processes into digital ones. The core process remains unchanged but is now in a digital format. However, by ensuring data is machine readable and instantly sharable across the parties involved, multiple processes will be removed or automated, increasing efficiency and restricting the element of human error or capacity issues such as staffing shortages.

The state of standardisation and governance in the property buying process

In this section we categorise standardisation and governance efforts either through data standards or services into two categories, horizontal or vertical. Horizontal standardisation is often aimed at addressing cross-cutting concerns that are either sector agnostic or exist across a whole process, whilst vertical efforts are targeted at optimising specific steps.

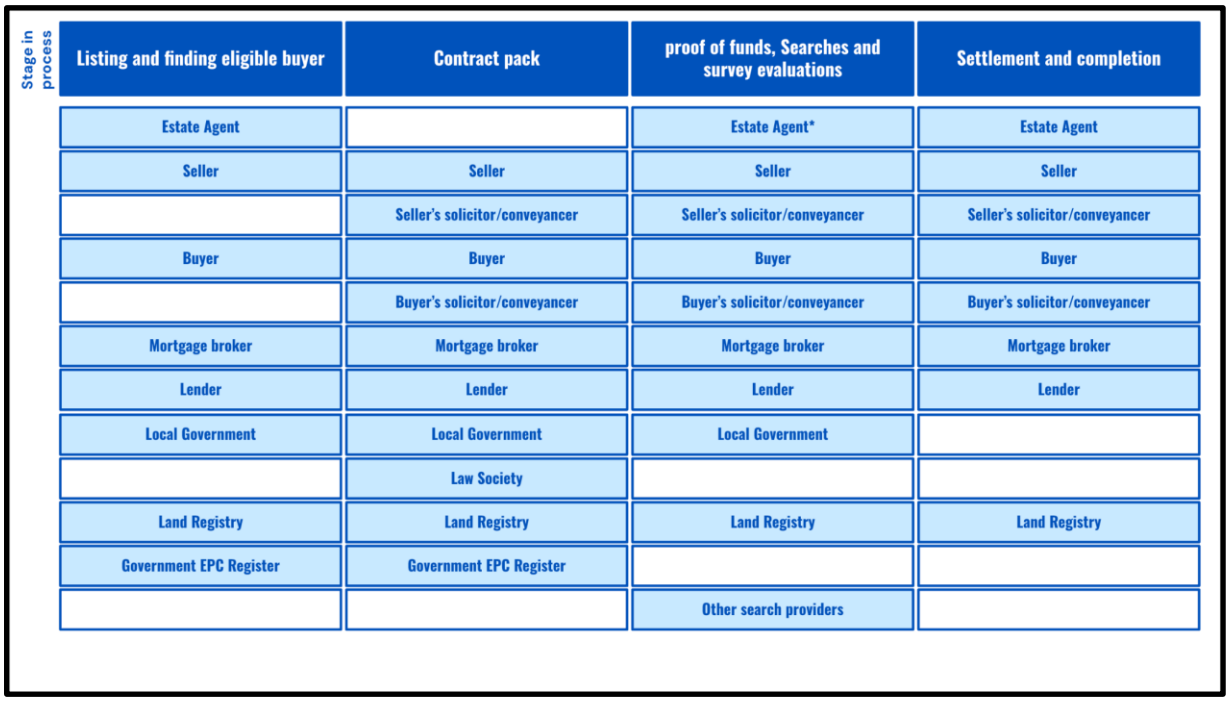


Figure depicting parties involved across four stages of the home buying and selling process (Note: This figure is illustrative and does not exhaustively categorise the full process)

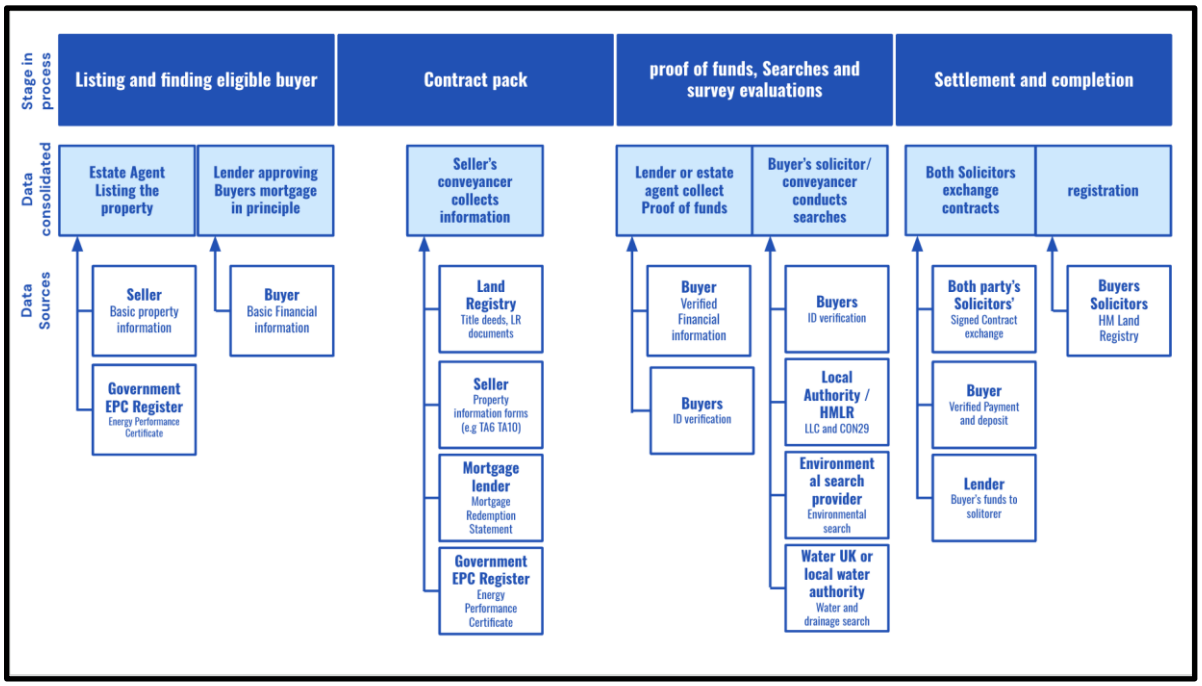


Figure depicting key data consolidation moments, and the various sources of data required, across four stages of the home buying and selling process

Current Horizontal approaches and standardisation

Horizontal approaches typically involve addressing cross-cutting issues common across the whole process; for example for data or services the lack of trust, signs, seals and tamper proof information; or connectivity approaches that would require buy in across multiple phases, to ensure that upstream information is of sufficient quality for downstream purposes too. Horizontal approaches tend to require or support a broader digital transformation and reimagining of the user journey across multiple parties, and therefore require consensus and agreement. In this framework, broad brush legislative interventions such as GDPR are also considered to be horizontal interventions because they impact all participants handling Personally Identifiable Information (PII).

Horizontal attempts towards a more unified transaction process

Because of the complexities inherent in the process of property purchasing there have been a number of attempts at guiding professionals and consumers through the process. These approaches are all broadly trying to improve and standardise the process and are attempts at tackling the problem of horizontal transaction complexity.

The conveyancing protocol (from the Law Society) attempts to specify actions that should occur when conveyancers are acting for either a buyer or seller. It avoids defining itself as a checklist or a process and is instead intended to provide conveyancers with guidance that ensure the parties in the transaction are treated fairly. Because it forms part of the professional standards of conveyancers there are incentives and risks and potential liabilities to conveyancers if they do not follow it.

Some **government guidance** for home buyers and sellers on the high level process is provided by MHCLG.

Additionally **Core Practice Management Standards (CPMS)** are imposed by the Law Society's Conveyancing Quality Scheme (CQS). They include practice procedures for following lender's requirements set out in the UK Finance Handbook. Both of these Law Society protocols and management standards are well adopted, though they do not address expectations in terms of what might constitute a modern digital experience.

A number of other attempts have been made to try and simplify the horizontal transaction process or re-arrange the process such that it is simpler or more optimal. Generally, these alternatives have tried to shift information acquisition and exposure to the buyer to the beginning of the process, so decisions can be made sooner, with less time wasted on transactions that otherwise wouldn't have proved viable. These approaches have struggled to gain traction

Buyer's and Seller's Property Information (BASPI). BASPI is a questionnaire designed to be completed by the seller at the point of marketing a property, using either their knowledge or relevant data from the local authority. It is split into two sections: part A which covers

material information; and part B which covers the remainder of information required for conveyancing due diligence. By exhaustively covering all information required throughout a transaction it aims to act as a single source of the truth to all stakeholders for the duration of the process, which would reduce errors, delays and ensure that estate agents, conveyancers, and lenders receive consistent, verified property details at the start of the transaction.

Material Information. Under legislation set out in Consumer Protection from Unfair Trading Regulations 2008 (CPRs), estate and letting agents have a duty not to omit material information from property listings. Material information is defined by the CPRs as "information which the average consumer needs, according to the context, to take an informed transactional decision"[9]. The National Trading Standards Estate and Letting Team (NTSELAT) have published a list of what this should include in relation to a property transaction so that property agents are clear on their responsibilities for gathering information to display on a property listing. The aim is to encourage the sharing of critical information up-front in the transaction process, and by its division into part a, b, and c material information aims to make a distinction between information which is material in all circumstances, and that which depends on circumstances. Material information though mandatory is still not included on many property listings with studies[10] showing 25% of listings still fail to include an EPC rating, 33% fail to list a council tax band, and 50% excluding details on ground rent.

Digital Property Logbooks go beyond Material information in being an ongoing, maintained record of information about a property from EPC ratings to updates and changes to the structure and installed devices (boilers etc). There is potential for these to shift information capture to the left before going to market and significantly inform Material Information requirements. Digital Property Logbooks have been adopted in several European Nations (notably France, Belgium, and Sweden) and are mandated for adoption more widely. Efforts to fully develop and apply the concept in the UK have been limited to date. The Home Buying and Selling Council have a Property Logbook Workgroup. Whilst the Residential Logbook Association (RLBA) has six PropTech company members. Some trials are mentioned in relation to the RLBA with new-build properties, particularly in relation to the First Homes scheme, though the extent of the trials and what was tested is unclear.

Property Data Trust Framework (PDTF) was developed by the Open Property Data Association and members of the Home Buying and Selling Group. It is a set of data standards, technical standards, and rules that people and organisations might use to access, share, use, and reuse verified property information for the purposes of co-ordinating a transaction. It aims to be a platform and technology agnostic and is built on open standards. Our research uncovered two implementations of the PDTF; LMS's National Property Transaction Network which appears to be using for trials and as a sandbox, and Coadjute. It's not clear what level of adoption Coadjute currently has by industry professionals.

- There is a recognised need for governance principles, but at this point they are not fully developed.

[9] https://www.legislation.gov.uk/uksi/2008/1277/regulation/6
[10] What buyers need to know: Are property portals and estate agents delivering upfront information?

- The framework sets out roles and responsibilities for different stakeholders in the process.
- A proof-of-concept technical implementation of the framework has been developed around the Home Buying and Selling Group's 'property pack,' which combines the BASPI dataset as well as other key data such as title deed, EPC, and property searches.
- The framework sets out a number of JSON schemas which together represent the full range of property data from the property pack. This includes BASPI, Propertymarks PIQ and Law Society TA forms (if licensed separately).
- The framework uses a claims-based model to represent for each element of property data. This model appears to be based on the OpenID Connect with DIF verified claims open standards, though W3C verifiable credentials were at one point considered.

Current Vertical standardisation and governance stage by stage

Vertical approaches are typically focussed on addressing the concerns or details with a specific part of the process. Therefore, vertical approaches tend to be more about incrementally optimising a single part of the process or focusing on a single identifiable user need in isolation.

In this section we use a simplified breakdown of the stages of a property transaction to examine the state of standardisation and governance at key points. We focus here primarily on the effects of standardisation and governance, or their absence.

Stage 1 - listing and finding eligible buyer

Current process:

- Sellers will contact estate agents who will collect:
    - Basic information for marketing purposes from the seller (e.g. address, property photographs).
    - Energy Performance Certificate from the Government EPC Register. If there's no EPC on record or it has expired, the estate agent arranges a new one.
    - Any other material information from various sources.
- Estate agents advertise property usually including it on listing sites such as Rightmove and Zoopla. PropTech suppliers such as Apex27 provide CRM solutions to estate agents to simplify the tasks, leveraging developer APIs from listing sites to integrate CRM and case management with lead generation, advertising, viewings management and other industry specific features.
- Lender engaged by buyer and potential role of mortgage broker to gain mortgage in principle

Current standards / services / governance widely adopted

Government EPC Register. An MHCLG-run service holds standardised data for both England and Wales, accessible through both a web portal and API. This makes it straightforward for anyone to find and download a copy of a certificate for a property, or for integrations to be built directly into property listing platforms or estate agents' software.

Energy Performance of Buildings (England and Wales) Regulations 2012. These set out requirements around EPCs for buildings for residential or commercial use, including a period of time for which an EPC is valid, a requirement that a building must have a valid EPC before it can be marketed, as well as requirements around accreditation of suppliers and no

cost for transferring the certificate. EPC's are published through two free access government services, "Find an energy certificate" for looking up individual certificates, and via MHCLG's open data communities epc service which provides bulk downloads, search facilities and APIs for accessing large collections of EPC data matching relevant criteria. These services may be used by PropTech to provide direct links from a property to its EPC at listing.

Consumer Protection from Unfair Trading Regulations 2008 (CPRs), ensuring the property is not deliberately mis sold e.g. not disclosing known defects, issues or flood risks, or doctoring photos.

Current standards / services / governance less widely adopted

National Trading Standards enforce anti-money laundering regulations by ensuring estate agents verify the identity of clients and report suspicious transactions, such as in cases where an estate agent fails to perform the necessary due diligence on a buyer's financial history.

National Trading Standards require estate agents to provide upfront material information about properties to potential buyers, and they provide guidance on the definitions of material information and make suggestions at how it may be sourced, but depending on the source of the information the format and reliability may vary widely, which undermines trust in the information further along the process. For example, the remaining term given for a leasehold property on a listing may be more or less reliable depending on whether the information has come from a copy of the property title or the seller's own recollection.

The Property Ombudsman and Property Redress handle complaints about estate agents. Currently there is no statutory regulation of estate agents in the UK. While some industries will have an independent regulatory body, such as the Financial Conduct Authority for financial services, estate agents have no central regulator. There are however professional bodies such as the Royal Institute of Chartered Surveyors (RICS) and Propertymark (formerly the National Association of Estate Agents) who set standards for their members. In doing so, they set best practice, investigate consumer complaints and provide accreditation for their members. While Propertymark and RICS will terminate membership if their members have been found to breach their Membership Rules, officially, the Property Ombudsman and Property Redress handle consumer complaints as all property agents are required to join an authorised redress scheme. These redress schemes have been approved by the UK Government.

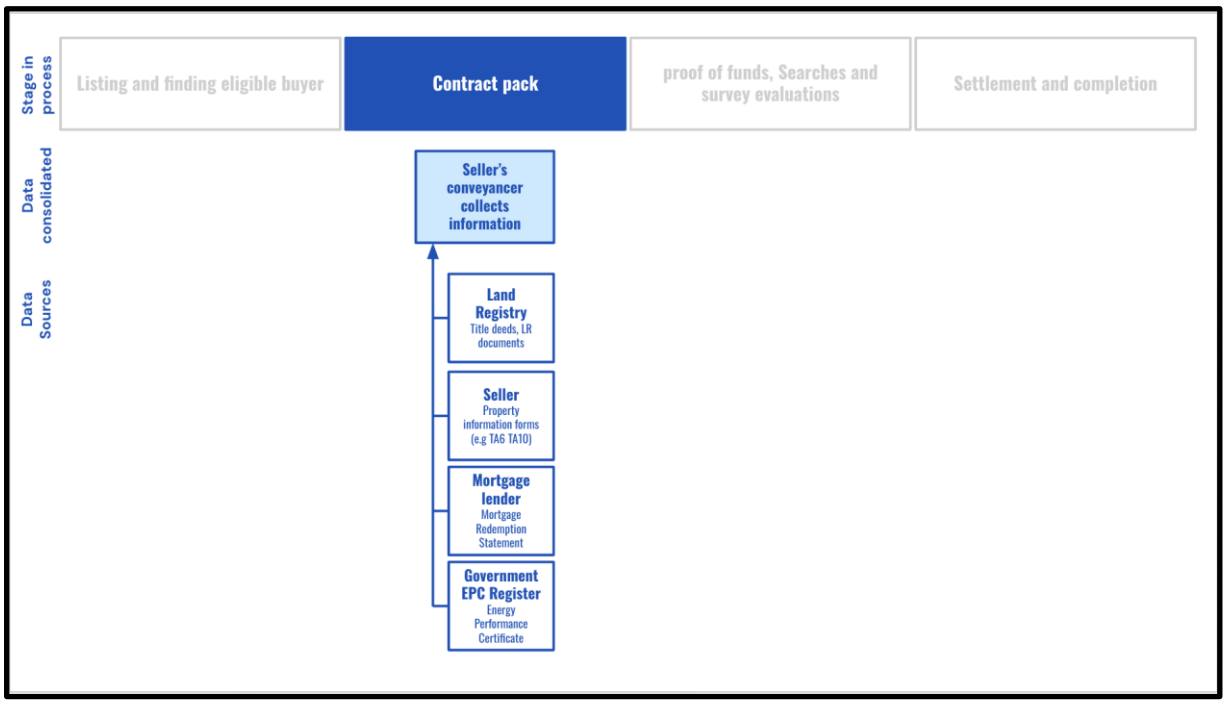
Emerging opportunities

While estate agents who have signed up to the professional body can provide additional assurances that the information they provide is accurate, a large portion of agents do not sign up to higher standards. Even then, since agents are not statutorily regulated, the information they provide is perceived not to be enforced to the degree other parties will trust the data collected. If it were to be seen as stricter, parties such as the seller's solicitors would be less likely to duplicate the data collection, as they would trust that the estate agents collected it accurately the first time.

Further legal requirement or requirement from property platforms for up front material information to be collected before listing. It is possible that having upfront material information would bring several benefits, such as.

- allowing the potential buyers to make a more informed offer
- speeding up the process as material searches can commence whilst other searches are also underway, rather than in a staggered approach
- higher completion rates or failing faster, as surprises down the process are headed up much earlier

Stage 2 - Compiling the Contract pack



Current process:

- Seller's conveyancer collects
    - Title Deeds, Proof of Ownership, Property Title & Land Registry Documents, from the Land Registry
    - Relevant Law Society TA forms completed by the seller, as well as leasehold information gathered if required.
    - mortgage lender provides a Mortgage Redemption Statement
    - Energy Performance Certificate (EPC) from the Government EPC Register

Current standards / services / governance widely adopted

Law Society's TA forms are designed to capture standard sets of information about a property that are important in relation to its sale[11]. Through their mandated use as part of the Law Society's Conveyancing Quality Scheme Accreditation, many of the TA forms have become de-facto standards for the capture of property information through the transaction process.

[11] https://www.lawsociety.org.uk/topics/property/transaction-forms

HMLR title services HMLR runs a number of services which make copies of property titles documents available to different types of users, from web portals for public users, to the Digital Registration Service, and Business Gateway APIs for conveyancers. Many software providers have integrated these services into their products, meaning conveyancers can order copies required with little effort and for a standard cost.

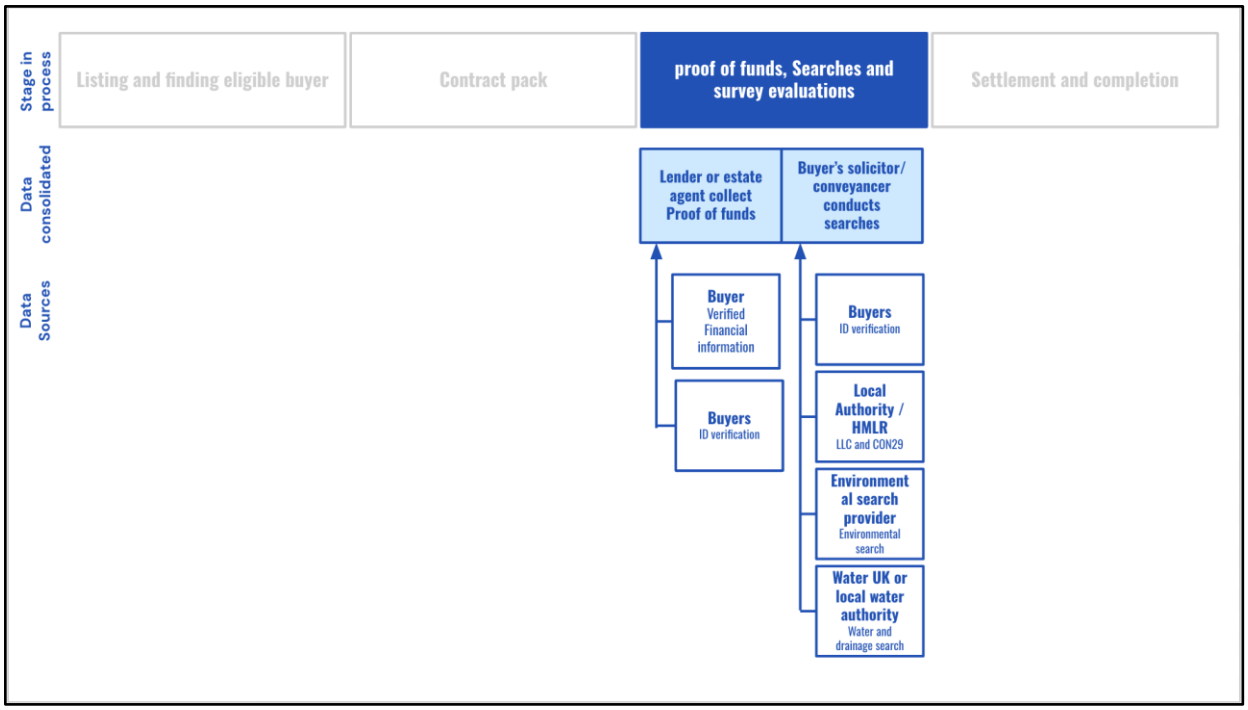
Current standards / services / governance less widely adopted

Law Society leasehold forms. These are used to structure responses about leasehold information that a seller needs to gather from the freeholder, management company or resident's or tenant's association for their property. While these forms provide some degree of standardisation, they do not support the sharing or re-use of the information held within them. And beyond the forms, owners of authoritative information on leasehold properties still vary greatly across a complex landscape. This can lead to duplication of information, inconsistent costs and timelines, and challenges pinpointing critical information.

Emerging opportunities

Structured and standardised title documents data. While title register documents may be digitised, the information held within is not structured in a standard format, meaning that conveyancers must often review lengthy documents to identify any relevant details, for instance the existence of charges or restrictions on a property. Extracting data from these documents in a machine-readable, structured format which used widely agreed terms would vastly increase the speed of access to key information. Furthermore, the detail of the property's boundary is also not digitised, which means checks further along the process on the property's spatial relationship to any local land charges must be made in a more manual way.

Stage 3 - Proof of funds, searches, and survey evaluations



Current process:

- ID verification, from the seller
- Buyers Local Authority local land charge search (LLC), ordered directly from the local authority, from HMLR, or a private search provider.
- Buyers Local Authority search (CON29), ordered directly from the local authority, or a private search provider.
- Environmental Search, ordered from an environmental search provider
- Water and Drainage Search, from local water and sewerage provider
- Any other specialist searches required, e.g. mining risks or chancel repair, from authoritative source or private search provider.

Current standards / services / governance widely adopted

Law Society's CON29 form formats (**standard).** The majority of the searches at this stage follow the format (e.g. CON29, CON29O, CON29DW, CON29M). Though the information gathered may be from a multitude of sources depending on the provider, it is usually shared as a completed, pdf version of the form. This means that many of the required question fields are standardised, but the data itself is not shared in a machine-readable format.

HMLR Local Land Charge service. The HMLR LLC programme has quality assured and standardised data from over a third of local authorities which is made available to both the public and business users through separate services. Users of the service can get immediate access to authoritative data for a consistent fee by ordering an official search, and the request for a report can be integrated into other systems. However, the cost of an official paid for search means private search providers make use of HMLRs free Search Local Land Charges on GOV.UK in order to reduce their costs. Some data is also published without charge by the relevant local authority through The Ministry of Housing, Communities and Local Government's (MHCLG's) open digital planning project via planning.data.gov.uk.

Data Services from the Environment Agency Shoreline Management Plans, Reservoir Flood Maps, and Flood Plan Explorer may contribute to information provided by intermediate search providers on environmental risks such as flooding. All these services provide open data via APIs.

UK Finance Mortgage Lender's Handbook. This sets out lender-specific requirements for conveyancers to follow, which can include things like the types of searches conducted for a residential property transaction. Conveyancers that fail to comply with the terms of the handbook can be subject to claims for breach of contract or professional duty. As such, the handbook and its requirements play an influential role in defining the processes that are followed throughout a transaction.

Building Societies Association Mortgage Instructions (also referred to as the BSA Handbook). The instructions provide mandatory guidance for conveyancers for all property transactions involving a mortgage. They are split into two sections: a core set of mortgage instructions; and specific requirements setting out individual lenders' policies. Conveyancers that fail to comply with the terms of the handbook can be subject to claims for breach of contract or professional duty. Majority of building societies use these instructions and are integral to the homebuying transaction process.

INSPIRE. This sets legal requirements for European member states to publish geographic information in a consistent format and was brought into UK law in 2009 and it has been well adopted by systems with a geospatial component, with for example local land charge data and property titles reporting INSPIRE IDs and support searching by them.

GDPR. Data Providers need to abide by the requirements of GDPR on the basis of legitimate interest, legal obligation or consent, and for Local Searches companies The Local Authorities (England) (Charges for Property Searches) Regulations 2008.

Current standards / services / governance less widely adopted

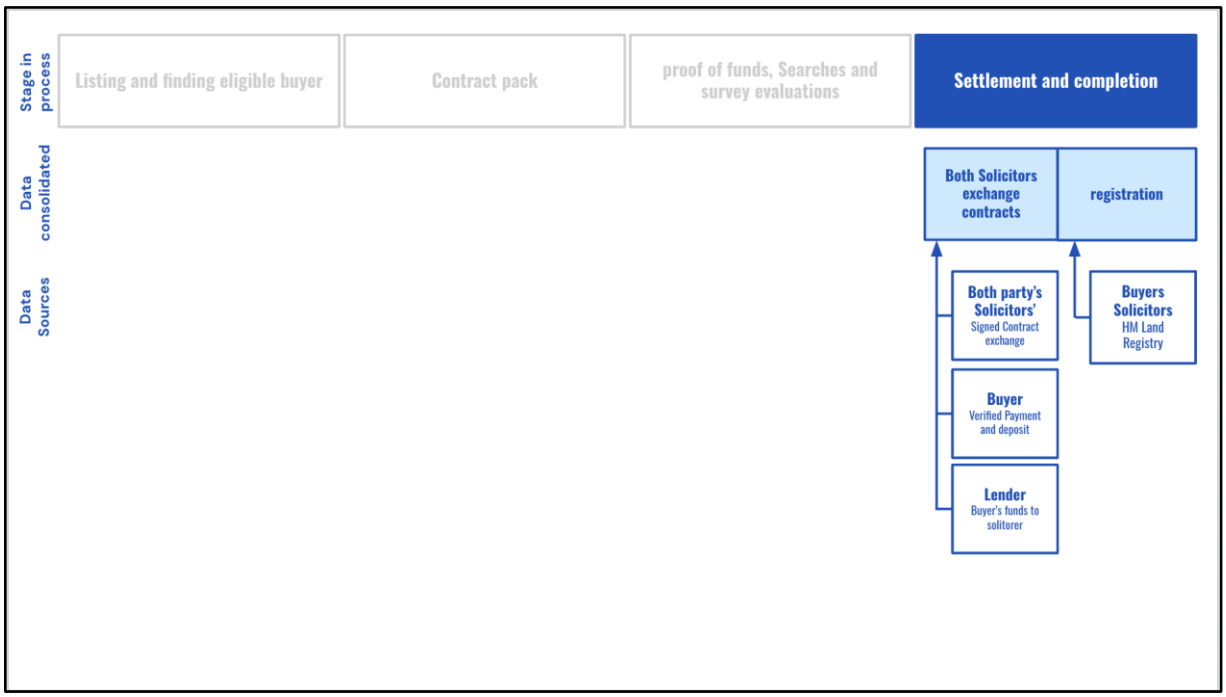
Open digital planning data specifications. MHCLG is funding and supporting 73 local authorities to publish open planning data to consistent FAIR standards. The programme has started with 8 key datasets and will expand to cover more local authorities. This is making more data that is required through the transaction process more accessible through services which support open standards.

Regulated search practices (The Search Code / Council of Property Search Organisations (CoPSO) / The NLIS Regulator)
Regulated search companies that adhere to The Search Code under CoPSO follow strict quality and compliance standards to ensure accurate and reliable property search data - this function is carried out by the Property Codes Compliance Board (PCCB). Some of these companies are also licensees of Land Data, the NLIS regulator, granting them access to operate as an intermediary for customers requesting and returning official local authority searches through the National Land Information Service (NLIS).

Environmental Information Regulations 2004.
The Environmental Information Regulations 2004 (EIR) are UK legislation that grants public access to environmental data held by public authorities, ensuring transparency and accountability in environmental governance. They require that such information be proactively disclosed and that specific requests be fulfilled within set timeframes, enabling informed public participation in environmental decision-making.

Mortgage Deed signing and Gov UK One Login. The Gov UK One Login system significantly enhances the mortgage deed signing process by providing a secure, centralized authentication method for accessing government digital services. This streamlined access not only simplifies identity verification but also expedites the completion of legally binding property transactions, ensuring greater efficiency and security.

Stage 4 - Settlement and completion



Current process:

Legal representatives or buyer

- Exchange of Contracts, by both parties
- Payment of deposit and remaining funds, by the buyer
- Transfer of Title and Registration with HM Land Registry, by buyers' solicitors typically through HMLR's DRS and Business Gateway

Current standards / services / governance widely adopted

Electronic Contract Exchanges such as e-conveyancing and Netanomics
Electronic contract exchanges enable the digital signing and secure transfer of property contracts, streamlining the conveyancing process by reducing delays and paperwork. This digital approach enhances security, improves efficiency, and ensures a more seamless transaction experience for buyers, sellers, and legal professionals.

Anti-Money Laundering (AML)
Anti-Money Laundering (AML) regulations are designed to prevent criminals from disguising illegally obtained funds as legitimate income by requiring financial institutions and professionals to conduct due diligence. In property transactions, AML measures ensure that buyers, sellers, and intermediaries undergo identity verification and source-of-funds checks to reduce the risk of fraud and financial crime.

BACS and CHAPS BACS: (Bankers' Automated Clearing Services) and CHAPS (Clearing House Automated Payment System) are two key payment systems in the UK. BACS is used for slower, cost-effective transactions such as payroll and direct debits, typically taking up to three working days. CHAPS, on the other hand, enables same-day, high-value bank-to-bank transfers, commonly used for property transactions and large business payments, ensuring immediate fund clearance.

TR1 form: The TR1 form (Transfer Deed) is a legal document used in the UK to transfer ownership of a property from one party to another, typically during a sale or transfer of equity. It must be completed, signed by the seller and buyer, and submitted to HM Land Registry to officially register the change in ownership.

Land Registration Act 2002: The Land Registration Act 2002 is a key piece of legislation in the UK that modernized the land registration system. It aims to simplify property transactions by ensuring that all land ownership details are accurately recorded and accessible in the Land Register, providing greater transparency, security, and efficiency in property dealings.

Current standards / services / governance less widely adopted

Conveyancing (Electronic Transactions) Act 2002, The Conveyancing (Electronic Transactions) Act 2002 is UK legislation that permits the use of electronic signatures and digital communication in property transactions. It ensures the validity of electronic signatures and digital documentation, aligning with the eIDAS Regulation (electronic Identification and Trust Services), which sets standards for secure electronic transactions within the EU. This legal framework, along with Practice Guide 82, provides guidance on how to meet the necessary requirements for electronic signatures and digital conveyancing, ensuring that these methods are legally recognized and enforceable in property dealings.

Gov.uk One Login
Gov.uk One Login could be used to streamline access to government services by providing a secure, centralized authentication method for individuals and businesses involved in property transactions. This would simplify identity verification and improve the efficiency of processes such as mortgage applications, land registrations, and electronic contract exchanges.

Standardisation lessons from other countries

Insights and learnings from other countries

Blockchain enabled transactions and property logbooks

Alongside HMLRs Digital Street research several other countries have adopted blockchain technology in property logbooks to enhance security, transparency, and efficiency in real estate transactions. Sweden's Lantmäteriet has trialled the use of peer to peer blockchain technologies to reduce transaction times from months to days, while Georgia and Estonia use it for fraud prevention and as a tamper-proof ledger of records.

Providing a tamper proof, permanent distributed ledger where no single party bears the whole cost for its maintenance and support is one of the biggest theoretical benefits to the use of peer-to-peer technologies, protecting against a service hosting a properties logbook from being abandoned by the organisation responsible for it. However, in practice the

governance and evolution of these networks still require consolidated control; though more radical models such as bitcoins Proof of Work consensus model are possible, their benefits to the property market are less clear, and consensus through more traditional means is likely significantly easier to manage.

Other benefits of blockchain are alleged to include faster transactions, lower costs, improved public trust, and smart contracts but challenges remain, such as legal barriers, slow adoption by banks, and privacy concerns. Countries with complex land laws or long history of imperfect data collection methods have struggled. India has a complex land ownership system, with multiple land records across different states. Blockchain requires a unified system, but different state laws make this difficult. Andhra Pradesh and Telangana started pilot programs to record land transactions on blockchain. However, lack of coordination between local and national authorities slowed progress. A significant challenge was that many historical land records are incomplete, and blockchain can't fix past errors in ownership disputes. Private companies can resist, such as in America where a Vermont pilot project tested blockchain for land records, but title insurance companies resisted, fearing job losses.

Some blockchains are building on developing open standards, such as the W3C verifiable credentials standard or competing standards from the Decentralised Identity Foundation (DIF) both of which support secure signing and resolution of identity and attribute claims through either the web or via blockchains through decentralised identifier (DIDs) standards. These standards are being adopted to varying degrees by vendors in the blockchain space including through open source blockchain toolkits, though it was not possible to verify if any deployed or trialled solutions implement these standards.

In a blockchain model user identity with any associated claims or verified credentials such as signed certificates proving accreditations or verified information such as an individual being over 18 can be stored securely on a distributed blockchain meaning access to the information can be kept in perpetuity, or at least so long as there is a network of nodes supporting it. As trust, security and verifiability are central to all blockchains, they can be thought of as a mechanism to implement a trust framework, though hybrid models can also be adopted.

Digital logbook (general)

There are two main approaches to digital logbooks. Government run, or government enabled but privately run. Most countries we have looked at are Government run, including Germany, France, Netherlands, and Finland. Countries have chosen government-run digital property logbooks to ensure legal certainty, fraud prevention, and long-term stability. A centralized system guarantees that ownership records are legally binding, reducing disputes and making transactions more secure. Governments have different incentives than private companies to provide reliable, long-term data storage, ensuring property records remain accessible for centuries. These systems also help enforce zoning laws, property taxes, and inheritance regulations, maintaining legal compliance across the country. Additionally, government logbooks speed up transactions by reducing paperwork and offering cheaper or free access to verified property records. Public access to these logbooks increases transparency, allowing buyers and legal professionals to verify ownership details instantly.

Norway has chosen to have private companies provide digital property logbooks alongside the government-run land registry for several reasons. This approach allows for greater flexibility and innovation, as private companies can quickly adopt new technologies and offer user-friendly services tailored to market needs, such as mobile apps and customizable logbook features. The involvement of private companies fosters competition, which can lead to improved customer service and lower prices for property-related services. While the government maintains control over legal property records to ensure their accuracy and security, private firms focus on enhancing the user experience and adding value with additional tools like property management and maintenance tracking. This model reduces the government's financial burden, enables more efficient services, and encourages innovation, offering a balance between state oversight and private-sector efficiency.

Industry and government collaboration

Norway’s approach to digitising its property system involved a government-led process of creating a digital land registry, making land records available online for greater transparency and efficiency. Open data policies allowed private companies to access property data through APIs, fostering innovation in the real estate sector. The collaboration between government agencies and private tech companies led to the development of digital platforms that facilitate property transactions, streamlining the process for both buyers and sellers. Legal and privacy regulations were put in place to ensure that data was shared securely and transparently. As a result, private companies used this data to develop innovative applications for property management, market analysis, and transaction processing, creating a more user-friendly and efficient real estate environment. This shift in Norway can be seen as a progression of digitisation (digitising land records), digitalization (using APIs and open data to enhance services), and digital transformation (collaborative efforts between public and private sectors to innovate and improve the entire property transaction process).

A specific example in Norway was the introduction of a platform called Altinn, a digital service platform that connects both public agencies and private users. Altinn allows for easy submission of property transfer documents, ensuring secure and efficient transactions. Through this platform, buyers, sellers, and professionals (such as notaries and banks) can quickly handle legal formalities and update property ownership records. Norway’s digitisation of its property system involved close collaboration between several government departments, private companies, and tech providers.

The Norwegian Mapping Authority (Kartverket), which is responsible for managing the official land registry, played a central role in digitising property records and creating a digital land registry (Grunndbok). Kartverket worked with other government entities, such as the Norwegian Data Protection Authority (Datatilsynet), to ensure privacy and data security while enabling secure access to property data. The Altinn platform, a government digital service, played a critical role in facilitating online property transactions by providing a central hub for document submission.

The Norwegian Ministry of Local Government and Modernization provided the overall strategic direction for the country’s digital transformation, ensuring that property services were aligned with broader modernization initiatives. Private companies, including tech firms

like Visma, Pexip, and Digipost, collaborated with the government to integrate property data into user-friendly digital platforms. These companies developed applications for property listings, transaction processing, and real estate management, making the system more accessible and efficient for consumers. Financial institutions such as DNB and Sparebank 1 worked together to incorporate mortgage data into the digital platforms, streamlining property financing.

The collaboration involved workshops and consultations where stakeholders defined technical requirements, shared feedback, and worked together to ensure a seamless digital experience. Legal frameworks and open-data policies allowed for the secure sharing of property data via APIs, enabling private companies to innovate while ensuring the accuracy and security of information. This collaborative effort resulted in a streamlined, transparent, and efficient property transaction process, benefiting all involved parties.

Norway has two robust and mature systems for Digital Identity and signatures in the form of MinID and BankID. BankID provides the highest assurance of digital signatures under eIDAS along with identity support to financial and other transactions, and they are widely used across Norway. We were not able to ascertain the nature of their use in property transactions.

Up front material information that is trusted, creates momentum, reduces wasteful activities, and increases capacity for handling more transactions

Across countries there are various levels of upfront information required before the point of listing. Most require a bare minimum of tenure and energy performance. Some countries go significantly beyond this and include large amounts of information done through searches on the seller's side, such as physical, structural, financial and legal aspects. The information being present at the beginning also gives a buyer greater trust in the value of the property and speeds up the process once a buyer is engaged in the transaction. Governments such as in Australia mandate a greater range of material information to be required before listing, and this is endorsed by the major property platforms who in turn require this information before being listed on their platforms. Estimates range from 2.5% failure to complete after an offer is accepted in Australia, compared to 30-35% in England. Of note, a major reason for failure to complete after an offer is accepted in England and Wales is survey results. A secondary benefit is that because of the up-front investment by the seller, non-committal sellers are less likely to engage in the process. If this practice is not standardised, it is likely that the market will not move to adopt up front material information, as there doesn’t seem to be an incentive (beyond possibility to speed up the sale and reduce chances of fall throughs) for the seller to invest before a buyer has indicated an interest.

Trustworthiness of land registry details facilitates quicker transactions

Having a consolidated and government backed database that is trusted by all parties to have up to date information can dramatically speed up transactions. Norway's Kartverket’s Digital Services geospatial data is updated in a matter of days, if not in real time. It also provides access for free to citizens, allowing timely verification of details. Along with availability and accessibility, this facilitates faster searches, financing, and completion, by removing the need

for clarification and back and forth communication between parties to verify if information is accurate. Investment is required in data management in order to facilitate digital transformation. To ensure data standards facilitate the best possible reuse of data, decision-makers must have a clear understanding of how the data they collect could be utilized by others. This means they need to consider potential uses beyond the original purpose for which the data is being gathered and stored. Scotland has identified this as a potential barrier in their move towards greater digital transformation.

Regulations require frequent enforcement to build trust between parties.

The question of responsibility, liability and enforcement is common across many countries in matters of accuracy of data provided. For example, in many countries including Germany and France, even though estate agents are technically regulated, conveyancers will still regularly conduct their own due diligence in countries where there is a belief that those regulations are seldom enforced. This leads to duplication of work and in turn, a loss of potential efficiency in the process at the early stages. Some countries have circumvented this issue by making up front material information a requirement before listing, which in turn brings in solicitors/ conveyancers into the process earlier and reduces the potential for duplication between them and estate agents. Regulation alone doesn't necessarily build trust but also requires enforcement and monitoring.

Market dominance and interoperability Issues

Supporting single private organisations can lead to the potential for monopolisation.

Disincentivising Gazumping and Gazundering

In countries like Australia, Germany, and France, strong legal frameworks and binding commitments at the offer stage significantly reduce the likelihood of gazumping. Similarly, in places where transparency and buyer protections (e.g. escrow accounts, reservation fees) are emphasized, sellers are disincentivized from gazumping.

General observations

Within countries, there can be significant variations in efficiency across regions because of processes and capacity. Some states or regions mandate using technology over paper, others still use paper-based documents for both transactions and data storage retrieval. There are also slower processes simply because the capacity of professionals in the region is not enough to handle spikes in demand for their services.

Speeding up the time between accepting an offer and completion reduces the risk of gazumping, breakdown, and chain failure. Because of slow movement of data and documents, there is an increased length of time between sale agreed and exchange, which increases the window of gazumping and chain breakdown. This in turn has a multiplier effect on the delays of multiple sales.

Standardisation lessons from other sectors

Smart Data Schemes and Open Banking

Open Banking is usually considered to be the first smart data scheme and was initiated by the Competition and Markets Authority investigation into retail banking in 2017[12]. It has since been regarded as a successful market intervention, having led to the active participation of 330 firms under the initiative, with 77% of end users finding it easier to track spending[13]. Following this success the government has looked to apply the same smart data approach in other sectors. The Smart Data Roadmap[14] published by the Department for Business and Trade (DBT) in April 2024, has road mapped exploring the use of smart data in the property market through pilot projects and other sectors such as energy.

The primary value propositions of Open Banking were to enable current account owners to:

1. Increase the ease with which they can move between bank account providers; by automating the secure transfer of their money, direct debits and associated standing orders.
2. Support the secure sharing of customer data, with their consented request with Authorised Third-Party Providers (ATPs). ATPs provide extra services to Open Banking users such as money management tools, or automating loans and lending decisions via brokering services, that otherwise may have required access to current account statements.

Following an analysis of Open Banking's governance, we identified the following lessons that could be learned and applied to the property transaction process:

Consolidation of governance following government intervention

Following an intervention by the Competition and Markets Authority (CMA) after their investigation into retail banking, the Open Banking Implementation Entity (OBIE) was formed as a limited company which was initially funded by the nine largest banks and building societies in the UK (the CMA9).

The nine banks covered the costs associated with the development and operation of the OBIE, which was later renamed Open Banking Ltd (OBL). The OBL was responsible for ensuring that the required open standards, trust framework, governance and compliance monitoring were developed and established.

The early governance of the OBIE was not without problems, and in 2020 following complaints from a whistle-blower an independent investigation and report was commissioned by the CMA which led to a lessons learned review being published in 2022. It

[12] GOV.UK Corporate Report on Open Banking

[13] The Smart Data Roadmap: action the government is taking in 2024 to 2025

[14]

is notable that once these issues came to light that the CMA was still able to intervene and apply corrective measures.

In spite of these problems the consolidation of standard setting into one organisation, with sufficient funding and agency to solve the issue at the required level of assurance has led to market innovation, increased competition and many of the intended outcomes benefiting consumers in the banking sector.

Bake-in trust, choice, and consumer focus into the standards themselves

The four pillars of Smart Data Schemes are:

1. **Trust**: Ensuring consumers can trust that their data will be handled securely and responsibly.
2. **Consent**: Consumer data access should always follow their consent, with the ability for them to withdraw access to their data at any time.
3. **Consumer Choice**: Ensuring consumers have choices across a healthy and competitive eco-system of suppliers.
4. **Support and Redress**: That adequate mechanisms for customer support, complaint resolution and remediation exist within the eco-system.

The Open Banking eco-system and its supporting standards and services such as the Open Banking register have been designed together from the outset to ensure these pillars are themselves embedded in the implementation, rather than just being within the governance of it. For example, the Open Banking directory is the trust framework that sits at the centre of the open banking architecture, and from a user's perspective represents the technical side of the Open Banking "App Store."

Authorised Third Parties (ATPs) following certification and conformance testing, are listed in this directory with accompanying digital certificates, granting them access upon consent to a user's trusted data. This directory check, which is built into the underlying protocols themselves ensures that ATPs can be quickly withdrawn from the whole ecosystem should they no longer be deemed trustworthy. Similarly, the Open Banking protocols ensure that a user's consent is explicitly obtained before any of their data is shared with the third party.

The management of entities in the open banking directory, therefore, connects the governance mechanisms of the OBL, directly to the standards and the eco-system itself, enabling a high degree of automation and trust.

Develop a suite of extensible interoperable open standards services and tools

Open Banking developed a large suite of standards, with extensive accompanying guidance, developer documentation, along with software tools for conformance testing, and hosted development environments to help developers build, test and integrate their services and products with the eco-system.

In order to enable interoperability in a trust framework, many levels of standardisation and services are needed. Open Banking uses the XML based ISO 20022 messaging standard,

which is bespoke to financial services, though not directly applicable to the property market its design and role is instructive to this domain.

This standard defines the structure of messages in the financial space and is built around a standardised but extensible Unified Modelling Language (LML) concept model, which helps ensure all messages sent and received can be unambiguously understood by the appropriate party. A domain model specified in the UML forms the heart of ISO 20022, that specifies the key entities in the domain (e.g. Banks, Accounts, Payments and Securities) and the properties they may have (e.g. a “credit card number”, an “expiration date” or a “first name”), and the data-types, structure and meaning of those properties.

An important feature of ISO 20022 is that by being built on XML it leverages both namespaces and extensibility as important features. This allows implementers and future iterations of the standard to more easily adapt to changing requirements. Other standards such as the US specific MISMO standard for mortgages follow a similar approach, using both UML and XML to achieve the same flexibility. More modern approaches these days might prefer to leverage JSON/LD alongside core vocabularies and ontologies written in RDF, to express and define classes and properties with a formal semantics and a more developer friendly syntax. It is notable that the W3C verified credentials standard has adopted this approach and is also being adopted by GovUK One Login: whilst competing standards from the Distributed Identity Foundation support extensibility through other mechanisms such as credential manifests and schemas.

Beyond the extensible standards, Open Banking also leverages dozens of other API, cryptographical, and connectivity standards. The most notable of these for this report are:

- **OpenID Connect (OIDC)** with **OAuth 2** - These are common open internet standards for authenticating users against other systems (e.g. their email account, social media or GovUk OneLogin), and granting access to use the service.
- **OpenAPI v3** (formerly Swagger) to provide developers with a schema, structured documentation, and tooling for Open Banking web service APIs.

Transparency and fairness for third party provider participation

Third Party Providers (TPPs) are typically fintech’s operating within the Open Banking ecosystem, and not only must they meet regulatory and compliance requirements to the FCA in order to be listed in the Open Banking directory, but the Account Servicing Payment Service Providers, (ASPSPs - i.e. banks) granting access are regulated to guarantee equal access to all TPPs who are listed in the directory, and are therefore prohibited from excluding fintech’s to preferred partners.

These fairness rules incentivise fintech’s to invest and compete in the ecosystem knowing they are operating on an equal footing with others and will not unfairly be prohibited from participating. The governance and legislative frameworks established by key players such as the CMA, OBL and FCA help provide these critical assurances.

Applicability of Trust Frameworks and Smart Data to the Property Market

One success factor specific to Open Banking that is not present in the property market, is that the consumer banking sector was already heavily standardised. Most consumer banks accounts are commodity products, providing familiar features such as debit cards, standing orders and direct debits. Accounts differentiate themselves from each other in relatively few ways, such as the size of permitted overdraft, or the interest rates and charges on the account.

As Open Banking was initially mainly concerned with consumer accounts, providing access to that financial data, and supporting moving accounts across suppliers this comparative simplicity with the existing high level of standardisation meant defining technical standards to facilitate the sharing and portability of data was relatively easy, when contrasted to the complex, multi actor, unstandardised state of the property market in England and Wales.

Relatively few kinds of actor interact with the Open Banking system directly:

- **ASPSPs** (Account Servicing Payment Service Providers - i.e. banks)
- TPPs (Third Party Providers) these are the FinTech's and service providers that participate in the ecosystem, they are subdivided into two kinds:
    - **AISPs** (Account Information Service Providers) services that are granted read access to financial information (e.g. budgeting apps)
    - **PISPs** (Payment Initiation Service Providers) payment services that initiate bank to bank payments, e.g. GoCardless provide API access to subscription payment services over direct debit infrastructure.
- **Customers** - Account holders

Open Banking use cases are arranged around the needs of these actors, with open banking's trust framework being centralised around the management of a single directory controlled and governed by OBL.

A comprehensive trust framework for the property market would likely need to include Estate Agents, Conveyancers, Surveyors, Lenders and Buyers and Sellers, or technology providers representing them by proxy. A smart data scheme applied to the property market would therefore present a greater challenge than Open Banking, and may require a different model, potentially partially federated or more fully peer-to-peer and distributed.

No established trust framework or smart data scheme follows a peer-to-peer model though there are standards emerging to support this, such as W3C's verifiable credentials standard, which is currently a candidate for recommendation status, and the OPDA's Property Data Trust Framework.

The need for trust applies to various aspects of property data:

- **Data integrity** How to ensure data hasn't been altered and is 100% accurate
- **Data standardization** Agreeing on a common language for storing and sharing information across different platforms
- **Digital identity** Establishing a "seal of identity" on the data to assure its authenticity

If the entities about which claims are stored are properties not people, then it would also be possible to use a trust framework to enable property logbooks.

Trust Frameworks require good governance, financial grade security and specialist skills

Good, transparent governance of standard setting organisations require an understanding of stakeholder needs, and sufficient understanding of the foundational legal implications for all parties in order to craft appropriate terms and conditions for engagement.

Additionally, the development of standardised trust frameworks that meet the required security and assurance grades for financial and property transactions are expensive and technically demanding, particularly as they need to adopt approaches such as mTLS (Mutual Transport Layer Security) in order to provide enhanced cryptographic authentication of peers in the network. Techniques such as mTLS enhance security and the guarantees the trust framework can give but add extra architectural complexity in terms of certificate and key management through public key infrastructure (PKI). Aligning the cryptographic system and governance framework with organisational and user capabilities and the required amount of security is a key part of designing a trust framework. It is however detailed technical work that requires specialist skills and typically enhanced peer-review and audit processes to ensure correctness and effective risk mitigation and management.

Developing such systems should not be undertaken lightly, as it requires substantial investment, specialist technical skills and commitment.

Open finance and mortgages

Mortgages are not as of March 2025 part of Open Banking's supported financial products, however the OBL have publicly stated intentions to extend open banking principles through open finance, to mortgages, pensions, investments and savings.

Additionally, the means already exist in Open Banking for mortgage lenders to become an Account Information Service Provider (AISP), in order to securely access transaction history in order to assess the status of finances to support a lending decision. The barriers to doing so are likely rooted in legacy systems, and a lack of desire to make changes to the current lending journey. Doing so however would in theory expose consumers to far less financial risk, as it would remove some of the need to share sensitive financial information through weakly secured channels.

The rise of Government Identity and One Login

A relevant standardisation opportunity and innovation occurring in government in the UK, and also in Australia, the US, Europe and beyond, is the rise of standardised digital identity systems. This complex set of related standards are being rapidly adopted and developed by industry, government, enterprise (e.g. through Microsoft Entra), and crypto startups.

Gov UK One Login is one effort, cherry-picking standards from this Cambrian explosion of standardisation and innovation; it launched in 2021 and is the latest iteration of the UK government's digital identity system, whose roots go back to Government Gateway in 2001,

and Gov.UK Verify in 2016. As of October 2024, One Login supports integration with 50 government services from across the central government and has issued over 6.2 million identities. Supported services include drivers' licences, with passports planned for later in the year (2025). In 2018 the first digital mortgage deed was signed using the service, and this capability has grown to support remortgaging, over 10 lenders, and is supported by a handful of large conveyancing organisations.

The mortgage deed signing service is managed, controlled, and integrated with HMLR and the title register, though the One Login service sits within DSIT.

One Login is compliant with the governments Digital Identity Attribute Trust Framework (DIATF) the Information Commissioners Office eIDAS (Electronic Identification, Authentication Trust Services) legislation and provides the following core features:

- A familiar single account and sign in process through the OpenID Connect and OAuth open standards, that enable users to use the same username and password to sign in to integrated digital services, and grant restricted information exchange to specified scopes. The W3C verified credentials standard is used to provide extensibility and support a growing set of verified attributes.
- Identity checking compliant with the government Good Practice Guide (GPG) 45 guidance on proving and verifying identity. At the time of writing supported levels of identity confidence are from none to medium. Higher levels of assurance are planned. This is achieved via the Vectors of Trust open standard (RFC 8485) which defines a simple data format for creating and interpreting trust vectors with some minor extensions to other standards including Open ID Connect and OAuth to facilitate the exchange.
- The ability for users to prove their identity at the above levels of assurance through evidence submission. The details of this are specified in GDS guidance on identity profiles.

Higher levels of assurance would be required to support property transactions in order to meet safe harbour requirements through HMLR's practice guide 81, as One Login currently only meets the lower Advanced Electronic Signature (AES) requirement set out by the eIDAS regulation. The higher level Qualified Electronic Signature (QES) with conveyancer verification would likely be required to support property transactions and digitally signing transfer forms; this higher level of assurance would likely also remove the need for witnesses.

User journeys currently include checking identity via:

- Gov UK ID Check App
- Document checks on the web
- In person post office checks
- Bank account or building society checks

A discussion of how this could be further adopted occurs in the section on barriers and opportunities.

How the Government successfully implemented accessibility standards

In the UK, at least 1 in 5 people have a long-term illness, impairment, or disability, and many more have a temporary or situational disability. As the government works on the behalf of citizens it was a moral, legal, and practical requirement for the government to ensure that they weren't excluding anyone from digital services.

The Technical standards supporting accessibility features in the HTML web standards pre-date much government policy in this area, and their origins are less in legislation, and stem from Tim-Berners Lee's leadership of the W3C, and his early recognition that the internet should be accessible for everyone. In 1997 the W3C started the Web Accessibility Initiative, which integrated accessibility support into HTML and was subsequently used to inform later legislation.

The enforcement of these standards, to ensure their adoption and integration into services came later. The accessibility regulations came into force for public sector bodies on 23 September 2018 via the Public Sector Bodies (Websites and Mobile Applications) (No. 2) Accessibility Regulations 2018. The regulations stipulate that public bodies must make their website or mobile app more accessible by making it 'perceivable, operable, understandable and robust.' This built on the accessibility regulations existing obligations for people who have a disability under the Equality Act 2010 (or the Disability Discrimination Act 1995 in Northern Ireland). The regulation also covers web and app content that has been outsourced to a supplier.

Lessons from GDS's own implementation of accessibility standards on GOV.UK

There are several lessons from the implementation of GOV.UK that may be helpful when thinking about how data standards could be embedded into the sector. The foundation of the success was a connection with their users that went beyond theoretical access-needs. GDS also supported government departments with clearly written guidance, workshops, community building and education. Finally, to ensure compliance, their standard was backed up with enforcement.

- **Identifying real user needs:** They found that not all the accessibility issues were solved by the WCAG standards. This required user research and observing citizens iterating with the website to identify hidden needs.
- **Included from the beginning:** Accessibility is a user need and when building services, creating components/templates and content, accessibility needs to be considered from the onset.
- **Automation:** They used data analysis to flag accessibility issues as manual processes missed repeat content or complex problems. Their Data Labs Team created a tool that looked through all the GOV.UK pages and identified pages that had specific accessibility problems.
- **Collaboration & Education:** They worked cross-government to other departments identify issues through reports and guided creators on how to address issues. They also ran workshops focused on creating accessible content, and a course on implementing access-needs.
- **Legislated in law:** Clearly written legislation that signposts where to look for further information.

- **Public updates ahead of time**: GDS Blog that informed the public about upcoming key dates for the legislation
- **Practical guidance:** The government helped directorates implement the changes:
    - A well-written strategy guide that helps organisations comply with the legislation.
    - A practical guide to implement the accessibility guidelines.
    - How to publish in HTML instead of PDF
- **Enforcement:** The legislation is enforced by the Government Digital Service (GDS), who monitors public sector bodies' compliance on behalf of the Minister for the Cabinet Office.
    - The EHRC and ECNI can use their legal powers against offending organisations, including investigations, unlawful act notices and court action.

Current process, barriers to change, and opportunities

As mentioned above, there are significant opportunities and a strong willingness across a broad range of stakeholders to adopt standardization and governance. The section below outlines these opportunities in detail, along with the existing and potential barriers to their implementation.

Current Process	Barriers to change	Impact	Opportunities
Duplication of effort on data gathering and searches	- A lack of verifiable information - Liability - Low trust in data collected from other parties due to lower assurance requirements, capability, and incentive concerns	- Slowing speed of transaction (from initial offer to completion) - negative user experience - poor practices and value to users to the service	- Greater visibility on data provenance (e.g. Data Trust Framework) - Greater use of digital signatures and verifiable information - Increase degree of enforcement or incentives on parties earlier in the process collecting data accurately (e.g. estate agents) - Verifiable digital signature to validate that information meets a standard of accuracy - Expansion of safe harbour incentive when assurances are met - Making forms attribute centric, allowing information to be accessible
Sequential approach to transactions / Parallel processes under utilised	- Lack of incentive of party e.g. estate agents to list up-front material information	- Slow transaction speed (from initial offer to completion) - Reduce rate of completion / fall throughs	- Encourage up front information at listing - Use of property logbook
Seller waits for buyer to engage before conveyancing starts	- Risk aversion to wasting money on searches	- Slow transaction speed (from initial offer to completion)	- Encourage up front information at listing
Sharing copies of documents (email/electronically or via the postal service) rather than via digital channels such as APIs	- Unstructured data, often in documents - lack of trust in digital formats, such as digital I.D for lending,	- Slow transaction speed (from initial offer to completion) - Increase risk of fraud and data breaches	- Increase adoption of digital services that facilitate data sharing - Greater adoption of digital signatures - Data standardisation

Current Process	Barriers to change	Impact	Opportunities
	particularly from legal professionals and lenders		- Data trust framework
Repeat manual transcription across documents and forms	- Unstructured data, often in documents	- Slowing speed of transaction (from initial offer to completion) - Increasing rate of completion / fall throughs - poor practices and value to users to the service	- Increased use of identifiers and services to resolve them - Increased use of data standards and formats - Increased use of service standards
Inconsistent personal data sharing	- Unstructured data, often in documents	- Increase risk of fraud and data breaches	- Reduce email use for sharing information - Using security assured systems with strong digital identity - Increase GDPR awareness and enforcement
Barriers to innovation	- Technical barriers to innovation such as a lack of availability of open data - Uncertainty of how government will impact the market (perceived risk of loss of investment should Government direction change)	- Maintenance of the status quo	- Government make clear their plans - Suitable Government owned data being made more open and accessible

Horizontal Challenges & Opportunities

Limited Secure Data Sharing

Insecure data sharing presents several risks, particularly within the property sector. These risks span from legal issues to financial losses and can affect various stakeholders.

Examples of risks that may arise from insecure data sharing:

- **Legal Issues:** Inaccurate data can lead to legal action if a buyer makes a decision based on incorrect information, such as whether a property is in a flood risk area. Estate agents and sellers could face legal issues if the data they share is not reliable.
- **Financial Losses:** Three in ten property transactions fall through, costing consumers around £1 billion, in part due to manual sharing and collection of information. Lack of trust in the data exchanged can lead to extra validation steps, increasing costs.
- **Fraud:** Weak identity verification standards contribute to fraud within the property sector. If identity isn't properly verified, there is a risk of people posing as someone else.
- **Data breaches:** Data breaches in property transactions could have significant consequences.
- **GDPR Violations:** Asking for unnecessary personal information can create GDPR risks.
- **Inaccurate data leads to poor outcomes:** Mistakes or misleading data lead to poor decisions and outcomes. Increasing buyer remorse. Poor quality data can lead to skewed results if used by people, algorithms or AI.

Barriers to secure data sharing

Data access barriers include fragmented data sources, outdated formats, and lack of digitisation across various stakeholders in the property sector.

- Multiple organizations hold different pieces of property data, making it difficult to access a complete picture.
- Many data sources still use PDFs or other non-machine-readable formats, hindering easy access and integration.
- Local authorities often lack skills and resources for digitising and maintaining property data.
- Some data, such as from utility companies, is not readily available for licensing or sharing.
- Statutory obligations and commercial interests can prevent some organizations from openly sharing their data.
- Lack of interoperability between different systems and data formats creates access challenges.
- Historical records may still be in paper form, requiring manual digitisation efforts.
- Competitive concerns in the industry can lead to reluctance in sharing valuable data.

These barriers create significant challenges in accessing comprehensive property data from authoritative sources. Overcoming them requires addressing technical, organisational, and commercial factors to enable more open and standardised data sharing across the property sector.

Opportunity to secure data sharing

Trust Frameworks Smart Data and Gov UK One Login

There is a lot of potential for leveraging an increasing role of Gov UK One Login, with it potentially becoming a piece of a larger trust framework, with public and private components. One Login currently supports a large number of government services, and it may therefore be a natural point to track life events across government relevant to property ownership such as the death of a joint proprietor. Failure for events such as this to be reflected on the register of titles can cause unexpected delays in property transactions.

For example, One Login could in principle be used by property professionals such as conveyancers, though we were not able to find any examples of One Login currently being used to authenticate professionals from industry. If this were possible however, it could potentially speed up the submission and signing process of transfer forms such as land registries TR1. This would speed up the process of gathering signatures and remove the possibility of error from three fields that cause half of all requisitions (Names, Execution e.g. missing signatures, and ID Evidence). Support for the higher level, Qualified Electronic Signatures at a minimum would be required to enable this.

If electronic signatures can be supported on HMLR transfer forms then it should then be possible to identify legal owners on the register of titles by an identifier rather than just a name, and by connecting to One Login there may be less barriers and more incentives for owners to maintain up to date contact information on the title register / address for service; potentially benefiting other cases, around beneficial ownership, and official correspondence with landlords and property owners.

Additionally, there may be a role for a trusted identity and signing system such as One Login to identify individuals, and ensure they have the appropriate credentials to carry out their duties, signing, certifying and sealing documents for professionals throughout the transaction process.

One Login makes use of many well adopted open standards such as Open ID Connect and OAuth, however it also uses W3C verifiable credentials as a mechanism for authorities to assign credentials to users and allow them to prove them via a presentation in a tamper proof and cryptographically secure manner. W3C verifiable credentials is notable in that it is agnostic about the topology of the trust framework; therefore, it is possible that One Login leveraging this could either form the heart of a centralised trust service or participate in a federated or fully peer to peer or “blockchain like” one.

If One Login couldn’t be used trust could in principle either be delegated to professional associations representing the major actors such as the law society for conveyancers or RICS for surveyors. So that their members can prove their professional certifications and

licensed status, or these processes could be more fully decentralised through a peer to peer or federated network.

In principle these trust frameworks could be established by profession ensuring certifications and accreditations amongst members are current and in place; whilst ensuring SLAM (Starters, Leavers, and Movers) processes on professional members are applied which may increase trust and help minimise fraud, for example prohibiting struck off members from facilitating transactions. Such an approach could be supported by the existing standards (W3C Verified Credentials, Open ID Connect etc) and could be assisted through a steering group such as the DPMSG.

Though it's worth noting that peer to peer models are relatively unproven in this domain, proof of concepts do exist and there are attempts to create specialised standards in the form of the OPDAs Property Data Trust Framework (PDTF). Trials of privately backed approaches, which have claimed to be block-chain based and may implement aspects of this framework are ongoing; though we were not able to verify this or exactly what was being trialled.

If material information were to be shifted left as far as possible through property logbooks it is worth noting that trust frameworks could play a key role there too. For example, if a property owner were to make changes to their building, for example by building an extension, a tradesmen or surveying party could in principle certify the work and provide guarantees upon completion through a QR code shared with the owner. This could trigger a user journey to attach the signed guarantee to the owner's digital property. The trust framework to support this would work similarly to one login, except that the entity the credentials are assigned to would be a building not a person. The European Commission provides guidance on digital building logbooks, which includes details of the technical standards and implementation expectations.

Complex emerging standardisation space for claims and credentials

A potential barrier to adoption is that there is a plethora of developing and emerging standards in this space. Efforts at consolidation and compatibility are ongoing and are largely driven by two overlapping standardisation communities:

- The W3C Verifiable Credentials suite of standards being produced by the Verifiable Credentials Working Group.
- The work of the Decentralised Identity Foundation's (DIF) claims and credentials working group

These standards are intended to be integrated into online services, mobile wallets, and biometric authentication mechanisms.

W3C verifiable credentials are currently adopted by Gov UK One Login, whilst the DIF are a more industry driven standardisation attempt focussed largely on addressing compatibility issues across implementations and identifying areas where new standards are needed. Beyond the main standards we have highlighted there is a complex web of related standards

at various stages of maturity, and understanding this fast-moving space is a recognised challenge for all involved.

Lock in, licensing and commercial interests

Several organisations in the property market have been able to establish key standards or services in aspects of the transaction process that are hard or impossible for buyers and sellers to avoid.

In some cases, these de facto standards and their role in the process are a source of revenue for the organisations responsible for setting those standards.
Further efforts in standardisation may benefit by adopting an existing and widely understood licence such as those approved by the Open-Source Initiative or Creative Commons.

Open licences may be combined with test suites, conformance and certification testing and trademarks, and standard setting organisations should be clear with adopters, implementers and working groups what the expectations are around this. The W3C for example openly licence their standards and do not provide conformance or certification testing; though they do also provide access to their test suites such that developers can ensure compliance with the standard.

Other standard setting organisations such as the WiFi alliance, provide free and open standards and test suites, but charge implementers for certification and use of their brand.

Limited adoption of Open Data

Where Open Data exists it is well used, for example Energy Performance Certificates are widely adopted and published through multiple services with updates of all certificates available from MHCLG. Open Data such as EPCs often leads to unintended benefits to other sectors, for example EPC registrations are often used as an indicator of housing completions.

In spite of these successes, commercial and paid-for access to proprietary data occurs with many services in the property purchasing process. In some scenarios this data may be a required part of the purchase process, as with paying for access to HMLR title deeds, which may occur multiple times for the same property in the same transaction as conveyancers, surveyors and lenders perform their checks. Whilst in other cases it may be mandated by circumstances, such as a lender requiring certain paid for environmental, coal authority, or underground asset search reports.

Organisations such as Ordnance Survey licence access to their Mastermap data, postcode data and associated lookup services like AddressBase which translate between addresses and UPRNs.

It is notable that many of the organisations involved in property transactions have monopolies over proprietary mandated data and may currently be unwilling to open that data for the public good due to their reliance on that income.

Inconsistent level of skills of parties

Education plays a multifaceted role in transforming the property market, encompassing consumer awareness, industry training, and change management. It is essential for the successful adoption of new technologies, data standards and processes, ultimately leading to a more efficient, transparent, and trustworthy property transaction system.

Educating buyers and sellers

Consumer education is crucial for empowering buyers and sellers to navigate the complexities of property transactions. Many people are unaware of the role of conveyancers. Increasing consumer awareness would enable people to make informed decisions, understand their rights and responsibilities, and actively participate in improving the system.

Challenges in consumer education:

- **Lack of awareness** Consumers often lack a clear understanding of the steps involved in the property transaction process, the roles of different professionals, and the key information they need to make informed decisions.
- **Information overload** the sheer volume of information available can be overwhelming, making it difficult for consumers to identify what is most relevant and trustworthy. As one group discovered, there can be as many as 200 questions that need to be answered about a property before it is purchased.
- **Complexity** Legal and technical jargon can be difficult for consumers to understand, hindering their ability to engage effectively with the process.

Strategies for consumer education:

- **Providing clear and accessible information** the government's "how-to guides" aim to rectify this and ensure everyone across the industry points consumers to the same information.
    - The Ministry of Housing, Communities and Local Government via /the Home Buying and Selling Council have created guides on buying and selling but it's questionable how well publicised and they are in PDF format, which requires downloading. GDS has stated that government content should be published in HTML
    - "*PDF is harder to find, use and maintain. More importantly, unless created another with sufficient care PDFs can often be bad for accessibility and rarely comply with open standards*"
- **Raising awareness of material information** Educating consumers about the importance of material information, such as property defects or legal restrictions, can empower them to ask the right questions and make informed decisions.
- **Promoting early engagement** Encouraging consumers to instruct conveyancers early in the process can ensure they receive timely advice and guidance.

- **Explaining technical concepts** for example, it is important to explain what smart data and digitisation mean to people, so they do not automatically think it means they are going to lose their job.

Educating industry professionals

Industry training is equally important for equipping professionals with the knowledge and skills they need to embrace new technologies, data standards and processes. This includes conveyancers, estate agents, lenders, and other stakeholders involved in property transactions.

Challenges in industry training:

- **Change** Some professionals may find it difficult adopting new ways of working, particularly if they perceive it as a threat to their existing business models or roles.
- **Digital skills gap** A lack of digital skills and maturity among some professionals can hinder their ability to effectively use new technologies and data standards.
- **Siloed working** A lack of communication and collaboration between different professions can create barriers to adopting a more integrated and streamlined approach.

Strategies for industry training:

- **Promoting data standards** digital skills vary between Conveyancers, so it is important to provide information to them about the value of right first-time applications.
- **Upskilling the workforce** Providing training and resources to help professionals develop their digital skills can enable them to embrace new technologies and data standards.
- **Encouraging collaboration** Creating opportunities for professionals from different disciplines to work together and share knowledge can foster a more integrated and collaborative approach.
- **Demonstrating the benefits** Highlighting the benefits of new technologies and data standards, such as increased efficiency, reduced risk, and improved customer satisfaction, can encourage wider adoption.

Traditional ways of working

Many professionals are still relying on traditional paper-based or digital document formats like PDFs and Word documents, despite the availability of more efficient digital solutions. There is a general distrust and slow adoption of digital tools, with many professionals still viewing PDFs and Word documents as the "digital equivalent" of paper forms. They feel more comfortable with these familiar formats, and they are struggling to move away from these legacy document-centric workflows, as they are deeply ingrained in the industry.

Actors in the sector are described as being "addicted to PDFs" and resistant to adopting more streamlined digital processes. Attempts to digitise processes often involve creating digital versions of paper forms, which still maintain the look and feel of traditional documents.

This is done to provide a sense of familiarity and comfort for users, even though it does not fully leverage the benefits of digital tools.

The use of outdated document formats and workflows is seen as inefficient and frustrating, especially for clients who expect more modern, user-friendly experiences. Professionals acknowledge the need to move towards simpler, more customisable digital solutions that better meet the needs of all stakeholders.

The limitations of PDF, Microsoft Word, and other closed formats

Leaders in digitisation are frustrated with the prevalence of PDFs and scanned documents in the property and legal industries, which hinders the ability to effectively utilise digital data. Much of the existing data is in the form of analogue documents rather than structured digital data, making it difficult to leverage modern digital systems and tools. There is a desire to move away from the reliance on PDFs and scanned documents, and instead provide data in a more machine-readable format that can be easily integrated into digital workflows. The key challenge appears to be breaking the "addiction to PDFs" among lawyers and other professionals in these industries.

The Government Digital Services (GDS) have stated that public bodies should avoid using PDFs, as "*Compared with HTML content, information published in a PDF is **harder to find, use and maintain**. More importantly, unless created with sufficient care PDFs can often be **bad for accessibility and rarely comply with open standards***." This issues with PDFs are:

- They do not change size to fit the browser.
- They're not designed for reading on screens. A PDF document that was created for offline use will not suit the context of the web and is likely to result in a poor user experience
- More carbon is emitted supporting attachments such as PDF. A 2Mb PDF emits an estimated 0.561g of CO2e every time someone views it versus 0.395g for the HTML version.
- It's harder to track their use than content viewed in HTML.
- They cause difficulties for navigation and orientation.
- They are **not likely to meet accessibility standards**. Even if this work is done according to best practice, there's still no guarantee that PDF content will meet the accessibility needs of users and their technology.

Financial barriers and incentives for data sharing

There is a lack of financial incentive for some parties to share data and information in the property market. Some industry players are seen as being unwilling to collaborate on common standards, which may pose a threat to their business model. The overall sentiment is that the lack of financial incentives and the polarized nature of the industry are hindering the development of a more transparent and collaborative industry.

Proptech organisations also recognised their own resistance to common data standards where they have worked hard **to get data from a wide variety of sources, perceiving change that opens up common data standards to all to impinge on their projected benefits.** These are understandable viewpoints and represent the challenge in corralling a sector more diverse than in open banking around common standards.

Limited Governance

Governance improvements are needed across multiple areas to enhance the property market. These include regulation of property agents, standardization of processes, and establishment of data trust frameworks.

Challenges on governance in the sector

- Complex and varied parties
    - Likely to be hard to fully jump to a centralised / “hub and spoke” model - decentralised / federated model may be more appropriate

- Limited authority
    - Central government has limited ability to enforce changes of practices on Local Authority if deemed that chances would incur local authority investment

- Danger of State aid or encouraging monopolisation
    - Avoid disproportionately favouriting some private companies in the sector

- Incentives and pressure can vary
    - e.g. local governments receive pressure from constituents to maintain services. Downtime can be required for shifting practices

Adherence to the rules, regulations, and standards set by governance bodies is enforced through various mechanisms, including regulatory oversight, compliance audits, professional standards, and legal consequences.

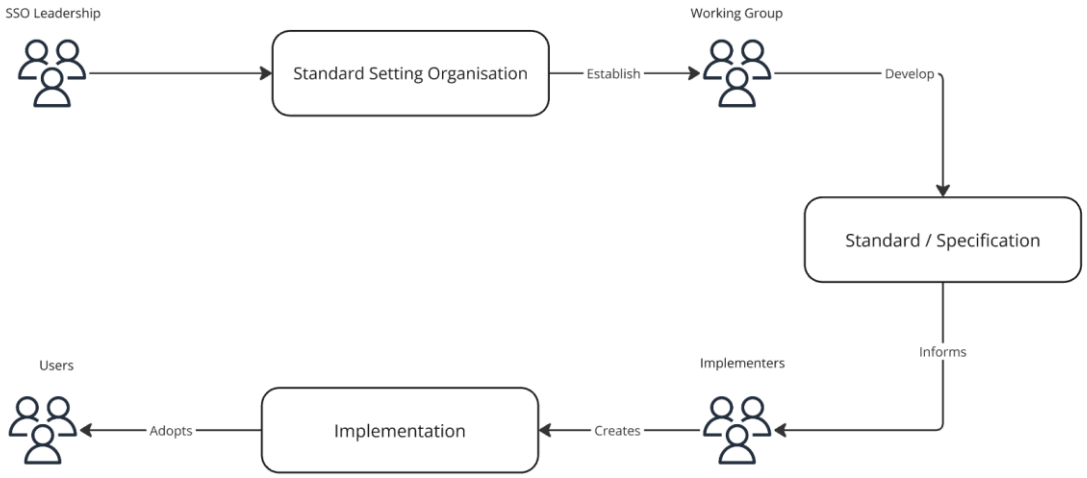
Due to significant variations in the ability and likelihood of enforcement across different governing bodies, there is a lack of trust between parties that standards will be consistently upheld. This lack of confidence leads to inefficiencies, as one party may end up duplicating work already done by another to mitigate potential liability. If parties trusted that earlier stages of the process were handled properly, fuelled by a genuine fear of enforcement, transactions could proceed more swiftly and with less redundancy. A common example of this is conveyancers conducting their own research into properties, even though estate agents have already submitted information. This often occurs because conveyancers doubt that estate agents will be effectively penalisedfor providing inaccurate information, thus reducing the incentive for estate agents to ensure their data is reliable from the outset. This problem is compounded by the high number of parties. Furthermore, to a greater extent in England than in Wales, the high number of providers in each party reduces the importance of reputation, again reducing the incentive to ensure high quality of practice.

The Governance of standard setting organisations

Broadly speaking, standard setting organisations are either concerned with a specific vertical or industry, such as law, or the property market or are horizontal and industry agnostic. The horizontal groups, such as the ISO, W3C and IETF typically aim to establish broad cross-industry standards focussed on generic concerns such as interoperability, security, and foundational technologies such as HTTP and HTML. Whilst the vertical groups will be more focussed on the needs of their industry.

Shared challenges and a recognition that stakeholders need to work together to overcome them for a collective benefit is the starting point for most industry led standardisation efforts. There is broad consensus on many of the shared problems with the property market in England and Wales; but currently little consensus on the best approach to resolving them. Most agree that the obligations and responsibilities of parties across a transaction need to change; but there is a fear that this will lead to unremunerated risks and costs, and present opportunities for vested interests to unfairly exploit their market position.

Trust is therefore a central issue for any property sector led standardisation efforts to address by establishing a clear and transparent governance process. In order to give a flavour of some of the issues that can arise it is useful review a general standardisation process; where a standards setting organisation establishes a working group to create a standard or specification which is then used to inform a group of implementers to build implementations, which they hope will be adopted by a group of users.



A generic standardisation process

For standards to be adopted their benefits also need to be understood and promoted to a broader audience of stakeholders. Therefore, this is a role for education and marketing around standardisation, this may happen within SSO's but also often. curs through the formation of satellite groups.

At each phase there are many basic governance questions that may arise:

The SSO and their leadership

- Who forms the SSO Leadership or board, and what rules govern their membership and behaviours?
- Is too much power consolidated in a small group of individuals, and are there appropriate checks and balances in place with opportunity for independent scrutiny and challenge?
- How are SSO leadership incentives aligned to the needs of implementers, users, and the wider eco-system? Are they representative of the membership, implementers, or users?
- How is the SSO funded?
    - Open Banking was initially funded by the nine largest UK banks and building societies (the CMA9) following a mandate by the Competition and Markets Authority.
    - The W3C is funded by membership fees, with different fees levied depending on the organisation's type and size.
    - The ISO is funded by (amongst other things) selling access to specification documents and certification.
    - Selling access to compliance testing services and test suites.
- Who can participate within the SSO as members, and what rights do they have to form working groups to develop and change standards?
- SSO's should be clear on their brand and trademark, and whether it can be used in relation to implementations or not.

Working group governance questions

- How do working groups ensure they have the skills necessary to form a standard?
    - Typically, with technical standards working groups will consist of a subset of implementers.
    - W3C working groups require a standard has at least two working implementations before it can become a recommendation
- How can working group members profit from their investment in the standard? Standards need to leave room for innovation and commercial exploitation.
- How transparent is the standardisation and consensus process?
- What mechanisms resolving disputes and fostering consensus exist with the working group?
    - The IETF who have set thousands of important internet standards emphasise a belief in "rough consensus and working code."
    - The W3C have a documented process, describing roles of participants, and voting.

Standard / Specification governance questions

- How can the implementers be sure that the IP developed in the standard is unencumbered from proprietary IP e.g. patents, copyrights?
    - Typically, an SSO will require working group members to sign a contributor agreement, to ensure contributions can be licensed by the SSO appropriately and be unencumbered by working group background IP.

    - If other standards are built on, are they also sufficiently open and royalty-free to avoid unexpected IP risks downstream?
- Who can access the final standard or specification? Open standards should provide free public access to the standards specification; though in the standards space the definition of open can be cloudy. For example, the ISO will often charge to access the specification but may not require implementers to license their standard (e.g. ISO8601).

Implementation / Implementer governance questions

- Are implementers required to obtain a licence or pay a royalty to use the standard? With most open standard definitions, they are expected not to.
- Are implementers required to pay for access to any conformance test suites?
- Do implementers need to pay the SSO or a licensee of it, to certify their implementation is conformant, and to use any trademarks related to the standard?

The Open Data Institute publishes guidance on creating open standards that may help standard setting organisations address questions like these head on and avoid early governance issues.

Challenges & Opportunities by Actor

Estate agents

Role of estate agents

Estate agents' business is centred around convincing property owners to use them to sell their properties. Thereafter, they need to market the property to and convince buyers to make an offer. Once the sale is made, many estate agents expect the solicitors to take over the process.

Challenges

Providing Material Information

In addition to the sales roles, estate agents are required to gather and display material information about the property they are listing. The Consumer Protection from Unfair Trading Regulations (CPR) 2008 makes it an offence for estate agents to omit or hide material information, or to provide it in a manner that is unclear, unintelligible, ambiguous, or untimely. The National Trading Standards Association released guidance for estate agents entitled Material Information in Property (2023). This is based on the Consumer Protection from Unfair Trading Regulations of 2008. Estate agents are required to ask the seller/owner for identity, title documents and information salient to the sale of their property.

- Tenure: If a home is freehold, commonhold or leasehold, this must be stated clearly, as should how much of a percentage homeowners would have in a shared ownership property.
- Council tax or property rates.
- The asking price or rent.
- Energy Performance Certificates.
- Non-standard features that could determine someone's choice to purchase a home such as parking, construction, and utilities options.
- Information that may or may not impact a person's choice to purchase a home such as conservation area inclusion, listed status, easements, building safety and flood plains.
- Broadband coverage.

Our understanding, from a small number of interviews with experts, is that **estate agents do not feel that it is their role to obtain this information**. They are incentivised to get the property on the market as soon as possible. Agents that comply are at a **competitive disadvantage** over those that don't follow the guidance. **Estate agents lack the financial incentive, know-how, sufficient staff and tools** (software & processes) to undertake gathering material information in advance to listing a property. Obtaining this information could take a long time, **which is likely to put-off sellers** who are able to list their property quickly with another agent that doesn't follow the guidance.

In Norway, estate agents are regulated and trained to do the work that conveyancers undertake. This leads to properties being listed with all required verified information. Therefore, searches are unnecessary, and properties can be sold and completed within days if necessary.

Estate agents are not setup to gather this information, nor do they see it as their role to obtain up-front material information. For various reasons **non-compliance cannot currently be effectively enforced**. There are no consequences to failing to comply with the guidance, but rather **a negative competitive penalty** for following the rules.

Gazumping and complaints about estate agents

In 2017 the Department of Business and Industrial Strategy published the report about buying and selling (Research paper number BIS/283). They reported:
*Anecdotal examples were given of **misleading and aggressive practices** designed to close a deal; **agents encouraging gazumping** by continuing to market properties after offers have been accepted and encouraging 'ghost gazumping' (BBC) where the seller demands a higher price between offer and exchange.*

Property Ombudsman figures show that consumers continue to complain typically about communication failure (20%); misleading sales details or advertising (12%); a failure in the agent's duty of care (10%) and commission fees (9%). Nevertheless, in general satisfaction with estate agents was reported to be high (81% among buyers and 84% among sellers).

The BEIS report found significant issues for buyers. Nearly **four in ten buyers** reported that they withdrew their offer either because of personal or financial circumstances or they

encountered issues with the home following a survey or problems with the leasehold. The remainder lost the property due to the actions of others either because they were **gazumped** (13%), the seller withdrew without explanation (10%), or the **chain collapsed** elsewhere (9%).

In short, the issues with some estate agents are:

- A failure to gather up-front material information
- Misleading and aggressive practices
- Gazumping
- Inconsistent ways of working:
    - Poor communication
    - Failing to give guidance to their customers

Poor enforcement of existing regulations

The enforcement of the regulation of estate agents has been widely discussed by the industry for years. This topic also came up repeatedly in our research.

Estate agents *are* under a form of conduct, specified under the Estate Agents Act 1979 (EAA 1979). **However, they are not currently required by law to be licensed or qualified**. In Scotland, where property law is different, a solicitor will manage much of the property sale. In England, Wales, and Northern Ireland, unless an estate agent is also a qualified chartered surveyor, they will liaise with other professional bodies. See Regulation of estate agents Research Briefing Published Monday, 05 September, 2022.

Since 1 October 2008 all estate agents in the UK who engage in residential estate agency work are required to belong to an approved redress scheme, either The Property Ombudsman or the Property Redress Scheme. This is a requirement of the Consumers, Estate Agents and Redress Act 2007.

As the lead authority the National Trading Standards Estate and Letting Agency Team (NTSELAT) have opportunities with stricter enforcement.

Trading standards have a 'Property Agent Checker" which allows the public to know whether an agent is correctly registered. Estate agents that aren't registered may be fined up to £5,000 and have their licence revoked if they have not joined a redress scheme. It's doubtful there is widespread public knowledge of the checker or use.

From the Regulation of estate agents (2022) report the Government's response was:

- More needs to be done to **inform consumers** about how to complain.
- We also acknowledge that the responses from some respondents **who felt that the current complaints process is not 'worth it.'**
- We will continue to work with industry, ombudsmen, and the regulator to **encourage estate agents to share their code of conduct. Training** on this issue may also feature in our mandatory qualifications to work as an estate agent.

These measures may have some impact, but **without stronger measures the widely reported issues are likely to continue**. Given that estate agents may be ill-equipped and feel that it's not their role to collect material information, what can be done to make it easier for them to comply? Could an initiative be set up to **automatically populate their case-management systems with digital information via a third-party service**?

Up-front Material Information is seen as an essential part of the solution to reducing fall-through rates and fraud. Therefore, helping estate agents to access this information within their current workflow is of high importance.

Opportunities

- Becoming Propertymark accredited or a member of RICs
- Using upfront information as a competitive advantage
- Adopting smoother processes facilitated by PropTech CRM platforms

Solicitors & Conveyancers

Solicitors and conveyancers face numerous challenges, including stress, heavy workloads, backlogs, and difficulties in communication and trust. Many of these issues arise from the complexity and inefficiencies of the home buying and selling process.

Challenges

A risk-adverse industry

The industry is cautious and risk-averse due to the litigious nature of the professions involved, where large sums of money are at stake and the fear of being sued is prevalent. Solicitors and conveyancers are trained to be cautious and look for potential mistakes, which they tend to carry over into their professional practices. This caution and risk aversion can lead to a focus on the legal aspects of transactions rather than providing a more comprehensive service to clients.

This has implications for introducing change. Everyone in the industry will be concerned how new ways of working will affect their liability.

Other challenges that solicitors and conveyancers face are:

- **Enormous variation in the sector:** The fragmented nature of the conveyancing industry, with multiple trade bodies, different types of specialisation, and practice-size makes it impossible to produce software solutions and standardised ways-of-working.

- **Heavy workloads and stress.** Conveyancing can be a stressful business with practitioners often feeling misunderstood. They are often chased by estate agents, brokers, and lenders, leading to frustration. Many are overworked

- **Multiple inefficiencies.** The complexity of long chains**,** lack of consumer education, and issues with accessing up-front information have a significant negative impact on solicitors' workload.

- **A doubling of complexity**. Since the 1980s there has been a significant increase in the legislation and processes that has been placed on solicitors' shoulders.

- **Acting as tax collectors.** In the UK, conveyancers also act as tax collectors for the government.

- **Need for continuous learning.** Conveyancing is a constantly evolving field, and conveyancers need to stay updated on new regulations and issues.

- **Communication issues.** A lack of communication among all parties involved in the property transaction can cause delays and inefficiencies. Conveyancers often have to spend time chasing different parties for information.

- **Lack of trust.** Solicitors and conveyancers may not trust all the information coming from other parties involved in the transaction, such as estate agents. They rely on cross-correlation to ensure data provenance. They check multiple sources to build a comprehensive picture. For example, Google Earth, GasSafe register and the FENSA website.

- **Training and experience** There are concerns that younger conveyancers may not be adequately trained or experienced to handle complex transactions. One source notes that some volume-conveyancers may train inexperienced people for only six months to a year before designating them as qualified conveyancers.

- **Protecting competitive advantage** Some may be fearful of change and want to protect their competitive advantage.

- **Risk and liability.** Solicitors are very nervous about their liability and are aware that in times of market downturns lenders may pursue them for perceived failures in following instructions.

- **Lender requirements and portals can be time-consuming**, with some lenders not accepting digitally signed mortgage deeds and a lack of standardisation.

- **Differing lender requirements** Lenders may have differing requirements, and conveyancers must be aware of each lender's specific criteria. Some lenders may use outdated technology. For example, a lot of lenders won't accept a digitally signed mortgage deed. Dealing with analogue ways of working further adds to solicitors' workload.

- **Implementing software services,** such as InfoTrack, don't always fit into the wide variety of workflows from small to large legal firms. Smaller firms often lack the time, money, and expertise to digitise their practices.

Opportunities

Maintenance of Property logbooks

Several of the experts we talked to felt that a digital property logbook, potentially with Land Registry's involvement, would streamline gathering information and significantly increase efficiency. Nevertheless, there are some challenges in implementing logbooks.

Upskill estate agents so they can work on an equal footing with solicitors

They also suggested that **estate agents should be further regulated**. The purpose would be to have agents that are qualified to undertake some of the tasks that solicitors currently take on. A more professionalised estate agent sector would improve collaboration between agents and conveyancers.

One expert suggested that sceptical solicitors could be convinced of the potential for digitisation by **demonstrating the real-word benefits using pilot programs**.

Government should make it easy for solicitors to digitise their workflow

Software services can help reduce the burden on solicitors, but smaller companies may need help finding the right solution and integrating it into their workflow. This coupled with the gradual adoption of new practices by younger professionals entering the field will eventually lead to a more efficient conveyancing process.

Property-Tech software vendors

Role of prop-tech software vendors

Proptech plays a crucial role in modernizing and streamlining the property transaction process. Proptech solutions can potentially **provide trustable data sources**, ensuring reliability and reducing errors in property information. Proptech can drastically **improve communication** and prevent fall-throughs by enabling digital document sharing in a sharepoint-like system. Real-time data sharing through PropTech solutions is vital for **improving speed, reducing fall-throughs,** and ensuring Material Information requirements are met.

Challenges

- **Complexity and diverse stakeholders** the real estate industry is complex with many stakeholders who all need to buy into technology simultaneously, making adoption difficult.
- **Unclear responsibility for investment** It is often unclear who should pay for PropTech solutions.

- **Navigating the market** with many PropTech companies, it can be difficult to navigate what each one does and who to work with, as there aren't always clear winners.
- **Integration difficulties** Smooth integration is required, but the problems that PropTech are trying to solve are not always clearly defined. PropTech need to understand exactly what problem they're solving and why they should invest in integration.

- **Traditional market attitudes** The property market is generally traditional and conservative in its adoption of change. Change management expertise is often lacking.
- **Lack of understanding** There can be a lack of understanding of the potential and benefits of technology, as well as worries about the risks.
- **Demonstrating value** Proptech is sometimes seen as a "nice to have" rather than a necessity if it is not matched to a specific business problem.
- **Need for education** There needs to be more education about what technology can do, especially in the buying and selling process.
- **Concerns about job losses:** People may resist digitisation because they believe it will lead to job losses, so education about what digitisation means is important.

- **Data issues:** Data exists in diverse formats, is not always interoperable, and has issues with maintenance.

- **Resource capabilities of smaller companies such as lenders:** Smaller lenders may lack the development resources to implement PropTech solutions.

- **Industry-wide adoption:** Even if membership bodies create something that would see tangible improvements, there's no guarantee that all professions everywhere would adopt it, which is really the only way you can have full-on market-wide improvements.

- **Risk aversion:** Professions are risk averse, and everyone is nervous about who risk is placed upon.

Opportunities

- Profit opportunities for solving systemic and localised issues with technology particularly in the areas of:
    - Trust and verifiable information
    - Providing more up front information
    - Converting data into actionable information
    - Automation and reduction of manual processes in a property transaction

Lenders

Lenders, including banks and building societies, have a significant influence on the property market. They play an important role in property transactions by setting requirements for conveyancers and valuation firms.

Role of lenders

- **Mortgage approvals and affordability**: Banks were already using online systems for mortgage approvals and loan applications. They assess the affordability of an applicant.
- **Property valuation**: Lenders determine property valuation using automated valuation models or physical surveys or a hybrid of data and a desk-based appraisal.
- **Risk assessment**: Lenders assess the suitability of a property to secure a loan. For instance, Nationwide has a property risk hub that assesses the suitability of a property as well as the affordability of the applicant.
- **Insurability**: Lenders check if a property is generally insurable.
- **Conveyancing requirements**: Lenders provide instructions to conveyancers about what they need to be informed about. They require conveyancers to lodge a certificate of title stating there are no problems from a lending perspective. Lenders may also specify that conveyancers must use the most up-to-date Law Society forms.
- **Digitalisation**: Many lenders are trying to become more digital through the use of portals.

Lenders' requirements can differ, so conveyancers must check each lender's specific requirements. Building societies, regulated by the Building Societies Association, may also have slightly different requirements.

Challenges

Litigious practices when the market crashes

Market crashes can have significant impacts on the property market and legal processes related to property transactions.

- During market downturns, lenders may scrutinize past lending files to identify potential shortfalls and pursue solicitors for not following instructions fully.
- There is a perception among solicitors that lenders may try to recover losses from them and their insurance when the market crashes.
- This fear of liability makes solicitors, especially less experienced ones, more cautious and prone to seeking additional indemnity policies or information.
- The threat of lenders pursuing solicitors in market downturns leads to a culture of solicitors trying to cover themselves legally.
- Market crashes can result in property valuations being lower than the value provided upon origination (the date of the original valuation) which could be under greater scrutiny when a loan loss is likely, which lenders may use as a basis to pursue solicitors/surveyors for perceived shortcomings in following lending instructions.

Market crashes create a climate of uncertainty and caution in the property market. Solicitors, particularly those with less experience, become more risk-averse, often seeking additional insurance policies and information to protect themselves from potential legal action by lenders. This perception of vulnerability to lender scrutiny during market downturns significantly influences the behaviour of legal professionals in property transactions.

Other challenges for lenders

Lenders like banks and building societies face several challenges, including varying levels of digital maturity, data standardization issues, and the need to manage risks effectively.

Specific challenges for lenders include:

- **Digital Maturity**: Lenders vary in their digital capabilities, especially in areas following the initial mortgage offer. Some lenders may still rely on outdated methods such as wet signatures and fax machines.
- **Data Standardisation**: A key challenge is the **lack of data standardisation**, which affects how data is shared and trusted. Lenders must often rely on conveyancers to flag issues with a property, highlighting the need for reliable and quick access to upfront information from trusted sources.
- **Increased Scrutiny**: Since the 2008 financial crisis, lenders are **identifying more issues** due to increased asset control by developers, creating new problems.
- **Fraud and Risk**: Lenders need to **manage fraud risks** and ensure data provenance so they can trust the information they receive. They also need to balance the risks of lending against the need to provide mortgages.
- **Conveyancer Relationships**: Lenders have to rely on conveyancers for information, but conveyancers may be nervous about liability and potential lawsuits from lenders in case of a market crash.
- **Standardised Processes**: There is a **lack of standardised processes** across different lenders. Each lender may have different requirements, making it difficult for conveyancers to manage. Building societies, for example, operate under the Building Societies Act and may have different obligations.
- **System Integration**: New banks have found existing systems difficult to use, sometimes setting up their own systems rather than integrating with established ones.
- **Coordination and Communication**: Lenders can be stuck "in the middle" of communications between different parties such as estate agents, mortgage brokers, and conveyancers, leading to inefficiencies.

Opportunities

- Standardise mortgage deeds and mortgage processes through open finance in a similar way to MISMO in the US.
- With support from the Bank of England there is an opportunity for PropTech such as PEXA, and lenders to establish settlement standards, governance.
- Work with HMLR to increase use of electronically signed Digital Mortgage Deeds.

Surveyors & Search providers

Surveyors and property search companies play key roles in the property buying and selling process. Surveyors assess property conditions, while property search companies gather crucial information about land and property.

Role of Surveyors

- Surveyors perform a wide variety of tasks across the built and natural environment, including land use, construction, valuation, buying and selling properties, property maintenance and management, and building surveying.
- Surveyors provide **technical information about a property**
- Surveyors offer **different levels of surveys**.
- Surveyors can conduct **physical surveys** of properties to identify issues, but are only for the applicants/buyers use. In Scotland a Home Report is provided.
- Surveyors' reports are categorized to show what needs fixing urgently, what needs fixing but is not urgent, and circumstances in which it may not be worth buying the house.
- Surveyors may provide **valuations**, where required as part of a survey if they are qualified to do so.
- **Insurers use software products** from surveyors to calculate the reinstatement value (how much it would cost to rebuild a property if it was destroyed).

Role of Property Search Companies

- Property search companies act as a **conduit between law firms, property purchasers, and lenders**.
- Property search companies produce reports on land, property, infrastructure, underground assets, and environmental issues.
- Property search companies gather data from various sources, such as local authorities and Land Registry.
- In Scotland, it’s the norm for search firms that specialize in efficiently gathering information from the different data sources required to prepare reports for solicitors.
- Property search companies provide crucial information like planning history and whether a property is listed, which impacts loan to value rate.
- **Information from property search companies can help potential buyers** make informed decisions before making an offer.
- Property search companies may offer digital tools for conveyancers, such as client onboarding, searches, and Land Registry interactions.
- Some search companies are building databases of information like road schemes by extracting data from council websites weekly.

Challenges

- **Inconsistent processes among estate agents** can make it difficult for other professions involved in property transactions.
- Some professions are unwilling to be involved early in the property transaction process.
- **There can be a lack of trust between conveyancers and estate agents**.
- Lacking or delayed access to upfront information leads to inefficiencies.
- Lenders' requirements can vary, causing confusion and extra work for conveyancers.
- **A significant challenge is interoperability**, where different sectors or even individuals within the same sector use different systems that do not communicate with each other.

- **Local authorities are often gatekeepers** of crucial property data. The Land Registry's digitisation of local land charges registers has improved some aspects, but challenges persist in standardizing and accessing data across different sources. Responses to searches can vary from 24 hours to 90 days depending on each local authority's digital capability and staff levels

Opportunities

- **Digitalizing property information** and using data standards can improve the efficiency and accuracy of property transactions. Having data to a data standard would enable case management systems and Land Registry to update information and be interoperable. A database of property information that can be uploaded during the sales process would be a significant step forward. **Digital technology can help bridge communication gaps** in the property buying process

HM Land Registry

HM Land Registry is the government agency responsible for the maintenance and integrity of the the legal record or 'register' of property and land ownership for England and Wales. HMLR supports the conveyancing process by providing the legal certainty necessary to support property transactions and proof of ownership. HMLR case workers provide fraud protection and ensure transactions and changes to the register are legally valid.

Challenges

- As one of the oldest land registration systems in the world HMLR faces substantial complexity in modernising land records and evolving the register and associated services to cope with the demands of a digital economy.
- England and Wales has a fragmented land and property system with responsibilities and governance split across other government agencies such as Ordnance Survey, Local Authorities, Coal Authority and MHCLG
- A large backlog of applications awaiting processing
- Requisitions of applications often due to small errors in documents that need to be clarified and corrected long after the property transaction has completed.

Opportunities

- Increase digitisation and access to the title register
- Provide expertise and governance as a key stakeholder and member of the Digital Property Market Steering Group particularly around the formation of data standards, services, and governance.
- Improve the efficiency and innovation of the property market particularly around property transactions by continuing the role out of digital services such as Local Land Charges and increasing the quantity of open data they publish.
- Improve transparency and openness of land ownership as a means to improve upfront information in the buying and selling process.

Conclusion

There are numerous opportunities for improvement, with significant activity across both the public and private sectors to enhance various aspects of the property transaction process. Beyond the overarching goal of systemic and interoperable advancements, key priorities include:

- **Increased trust** – This will particularly facilitate decreasing the prevalence of duplication of effort and double checking throughout the transaction process.
- **Greater digitization** – While immediate benefits include fewer manual errors, the real value lies in enabling transformative innovations such as AI and fully automated systems.
- **Better incentives** to move work in parallel rather than sequentially, to innovate, and to adopt innovation from other parties and governments. This will facilitate greater interoperability between parties, which will speed up individual processes as well as making subsequent tasks and activities more efficient and trustworthy.

We have included actionable recommendations that our research suggests will support improving on these three qualities.

Standards recommendations

Moving information up front is widely seen as beneficial however incentives, governance and co-design by stakeholders may need to occur to ensure it happens.

- Existing attempts have had limited adoption and a more thorough analysis of the reasons affecting adoption should be explored with relevant stakeholders.
- Data and statistics could be sought or gathered to identify the fields of upfront information whose absence is most likely to cause late-stage transaction failure; this may then support a more targeted approach to upfront information focussed on reducing late-stage transaction failures that waste time and effort for all parties.
- Explore partitioning upfront information into smaller reusable pieces, schemas should be changed from being monolithic to being more granular and attribute and field centric.
- Property logbooks have the potential to move upfront information acquisition to the point at which the property had a meaningful change, for example a loft conversion. Logbooks may require governance and intervention earlier in the process, and a deeper exploration of regulation, enforcement and incentives around building standards and other relevant factors affecting properties and land.

Standardisation lessons from smart data schemes with their strong consumer focus, should be applied to the property market:

- Transparency and fairness for third party providers and implementers of standards is key to successful governance.

- Principles for smart data schemes indicated by currently unpublished work by DBT are a good basis to apply to standardisation regardless of whether a smart data scheme is being implemented
- Extensibility in data standards for data exchange around an agreed upon and extensible domain model expressed and managed in either UML or RDF may be useful in agreeing common vocabulary terms and mapping them directly into technical standards. This model has been successfully used in Open Banking, MISMO and other standards, and is also supported through W3C verified credentials.
- The role of standardisation via trust frameworks and smart data schemes should continue to be explored. To some extent the terms trust framework and smart data scheme are synonymous.
- Digital Identity for buyers and sellers should continue to be explored
- Digital Identity for accredited and professional membership organisations should be furtjer explored to enhance trust in professionals

Service recommendations

- GovUK One Login may play a key role in identity assurance and signing throughout the property transaction journey. Exploring the potential of One Login with DSIT for buyers, sellers and potentially professionals in the property process should be considered.
- Promote opening up more government data and services in support of the property market:
    - Title Data
    - Mining Remediation Authority Data
    - Ordnance Survey Data
    - Highways Data
    - Local Land Charges (continuing)

Governance recommendations

- Existing governance models are insufficient, the DPMSG has a role to play here in facilitating constructive dialogue and progress towards key indicators.
- Industry specific standardisation efforts should be clear on their licensing and governance model, and how those standards can be implemented and adapted. A clear separation needs to exist between the standards specification, implementation, conformance testing and accreditation.
- Clarity of licensing around information gathering approaches should be sought, in particular adoption of recognised and compatible open licences as a basis for this should be explored across all stakeholders.
- Given licensing constraints opportunities to partition information requirements into smaller reusable and combinable pieces should be explored.
- The DPMSG should develop contacts involved with Open Banking and Open Finance in order to promote the development of relevant standards for mortgages

and ensure they align with Digital Mortgage Deed initiatives. This may remove the need to maintain a list of MDRefs and mortgage deed templates at land registry.

- Trials of the Property Data Trust Framework are interesting and opportunities for the DPMSG to co-design a trust framework with government and industry governance could be explored with the OPDA.