

# Creating a Pensions Dashboard

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## Pensions Finder Alpha White Paper

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## Executive Summary

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*“HMT should challenge the industry to make a pensions dashboard available to consumers by 2019, bringing together industry and consumer representatives to help them set direction and drive progress.”*

HMT and FCA, 2016

Pensions provision is changing and individuals must increasingly take more responsibility for planning ahead to ensure their financial well-being in retirement. For many, automatic enrolment is providing the means to do this, but more needs to be done to support the shift towards a more saving-oriented culture and to enable better long-term financial decisions.

For those more involved in the other end of the savings journey, the new pension freedoms introduced in 2015 have provided people with greater access to their pension savings and more flexibility in their choices of how to take retirement income.

Against this backdrop of change and increased complexity in the choices consumers must make, the ability for individuals to view all of their pension savings, alongside their State Pension entitlement, in one place, is essential. Engagement with financial services is increasingly digital in nature with more people accessing financial information and services online, so delivering a pensions dashboard with the interest of consumers first and foremost, represents an opportunity to transform the relationship people have with their pensions savings.

Interested organisations and companies had already formed a Project Team in early 2016 and started exploratory work, so welcomed the Government's challenge. The purpose of this White Paper is to report on the progress so far and to discuss the key challenges the Team has identified, explore some solutions and provide recommendations for the next phase of the Project.

## Background to the Project

In 2015 a discovery project (OIX, 2015) with participants from industry, consumer bodies and Government was undertaken to address the problem of 'lost pension pots'. Previous modelling commissioned by the DWP (Johnson, P. et al, 2010) shows that on average, individuals will work for 11 employers during their working life, meaning that going forward many individuals will acquire multiple pension pots.

That earlier project tested the hypothesis that “consumers will take action and make informed choices when they are provided with information and data about their pension savings.” The findings demonstrated that matching people with their defined-contribution pension pots and presenting the results in a dashboard were important to consumers and could lead to changed behaviour when engaging with pensions.

Out of this work was born the next phase of the project or the 'Alpha Phase' as it has become known.

## Alpha Phase

The Alpha Phase officially started in February 2016 with 14 organisations representing the views of consumers, the financial services industry and the Government.

This phase concentrated on aggregating a comprehensive picture of people's accumulated pension savings including defined-benefit pensions and defined-contribution pensions alongside the State Pension.

The core project focused on the following areas: consumer journeys; consumer research; architecture and data standards; and policy and governance. Each of these elements is explored more fully in the relevant sections, but briefly summarised in the discussion below.

## The Pensions Dashboard Model

One of the foundation blocks of the project was creating a definition for a Pensions Dashboard. The Pensions Dashboard is a free-to-consumer online resource that enables people to find and check their pension savings. The resource comprises three core components:

- **Digital Identity (ID):** The identification technology that verifies the user's identity before they can access their data.
- **Dashboard User Interface (UI):** the set of screens, menus and commands through which the user views their information and may carry out tasks based on it.
- **Pension Finder Service (PFS):** The technology that facilitates finding an individual's pension savings, collects information from pension providers (and DWP for State Pension) and delivers it to the User Interface.

The core consumer journey will consist of a combination of Digital ID, Dashboard User Interface and Pension Finder Service. More information on all three elements of the Dashboard can be found in Section 3.

There are three options for the way a Dashboard User Interface can be provided to consumers. The identified options are:

- **Option 1: single destination model.** There would be a single Dashboard User Interface and this would be accessed through one source which could be a consumer guidance brand.
- **Option 2: white-labelled model.** Again, there would be a single Dashboard User Interface, but this could be white-labelled and accessed through multiple financial services brands (such as banks, pension providers, financial advisers, fintech startups and not-for-profit organisations).
- **Option 3: federated model.** This would allow for multiple Dashboard User Interfaces, so that each provider could customise the interface and user experience to suit its own customers.

Section 4 explores each option in more detail and reviews their comparative advantages and disadvantages.

## Consumer Research

During the Alpha phase consumer research was conducted to further validate the concept of the Pensions Dashboard and to dig deeper into different aspects of the consumer journey.

When the idea behind the Pensions Dashboard was introduced, respondents were overwhelmingly positive. Younger participants found it a particularly appealing proposition. Even though they are further from retirement many recognised that the Dashboard has the potential to prompt more active management of their pension savings. Some pointed to the role that mobile banking apps have played in helping them to manage their money and believed a Pensions Dashboard could have a similar, positive effect.

Actions that respondents said they might take after using the Pensions Dashboard were:

- Seeking financial advice.
- Increasing their pension contributions.
- Being more proactive in managing their pensions.

In the research consumers showed a clear preference for the single destination model described above, as there was an anticipation or implicit assumption that any single destination model would be run by the Government or a government-backed service. Respondents said they would have a greater level of trust in a service run in this way rather than by private-sector providers, because of expectations that the Government would not use personal data for commercial gain.

However, the white-labelled model was seen as a potential alternative by some respondents – particular those who are already users of online banking and would value the ability to check the status of their pensions while checking their bank accounts. More details of the research findings can be found in Section 5. An explanation of the methodology can be found in Appendix II.

Further consumer research, digging deeper into preferences and usability of each ‘layer’ of the Dashboard will be essential in the next phase of the Project.

## Architecture

Defining the architecture for the Pensions Dashboard remains one of the most challenging aspects of the Project.

As mentioned, the Dashboard consists of a Digital ID, a Dashboard User Interface and a Pension Finder Service. The Pension Finder Service is the technology that facilitates the ‘find and collect’ element of the Dashboard. The Pension Finder Service must retrieve data from providers and deliver it to the Dashboard User Interface and will therefore need the ability to interact with a combination of pension providers, pension schemes (including public-sector schemes) and Government to access the State Pension.

The Alpha Phase of the project identified key technical challenges and decisions that impact on the final design of the architecture. This has led to the adoption of one set of principles for architecture and one for open standards to guide future decision making.

As well as the agreed principles, Section 6 of the report looks at the high-level architectural layers that make up the Pensions Dashboard and the specific architectural decisions for the Pensions Finder Service that need to be investigated further to overcome the challenges of integrating with different pension providers’ administration systems.

## Open API and Data Standards

Data standards ensure that a common format and meaning are used by all participants to enable the straightforward flow of data up and down the architectural layers. Open APIs<sup>1</sup> based on the agreed data standards will facilitate communication between the Pension Dashboard layers and any organisation fulfilling the role of a Dashboard User Interface provider, Pension Finder Service provider, Integrated Service provider or pension provider. All parties will need to be able to interact with the Open APIs.

At this stage no decisions have been made on the granularity of the Open APIs but Appendix III outlines the proposed data set that may form the basis of new data standards, distinguishing between the State Pension, defined-benefit schemes and defined-contribution schemes. Further work will be required for more complex types of pension, such as Self-Invested Personal Pensions (SIPPs) that have multiple asset classes, and these are likely to be phased in at a later stage of the project.

## Governance

To instil trust in the service it will be essential that a robust and overarching Governance structure is implemented from the outset. This new function will oversee operation, viability and standards applied to the Pensions Dashboard.

The Governance function will be responsible for setting the overarching strategy for the Pensions Dashboard by developing a plan to achieve its long-term objectives with a clear mission statement.

The strategy requires the support of the industry and consumer groups, as well as the Government and regulators. Certain features, such as the regulatory framework and the need for legislation, can only be decided by the Government and regulators, but key factors to consider are discussed in Section 7 of this paper.

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<sup>1</sup> Open API: An open standard is developed and maintained collaboratively and transparently, and can be accessed and used by anyone.

The Governance body needs to determine the strategy and establish the capability to embrace future changes, with sufficient scope to expand its role to accommodate different stages of implementation, respond to market changes and advances in technology. The supervision role will also need to include deciding, in particular, whether and when to allow alternative Dashboard User Interfaces to use data. A vision for how the governance structure might work is contained in Section 7.

## **Recommendations and Next Steps**

Consumer research has suggested that consumers value the option of a single destination dashboard above the others for reasons of trust, assurance with their data and simplicity in a complex subject area. Building a single-destination dashboard also offers the benefits of a more controlled environment in which to develop and test a high profile product containing sensitive data, allowing risks to be managed and reputational damage (particularly in terms of data protection issues) to be avoided.

At the same time, the benefits of making the Pensions Dashboard available through other financial organisations where consumers are already engaging in financial matters cannot be ignored, especially as this could have greater reach when trying to engage the population in their retirement planning.

With this in mind, the recommended approach is initially to build a single-destination dashboard that is, nevertheless, capable of, and technically ready to, be white-labelled through approved industry websites (such as pension providers), once the complete Pensions Dashboard service has been fully tested from a security and quality assurance perspective.

In terms of the Pension Finder Service, the practicalities of starting with a single Pension Finder Service outweigh the potential innovation benefits of multiple Pension Finder Services. However, the architecture will be future-proofed to enable evolution to support other models, including multiple dashboards, should demand arise.

The Project is now moving into a second phase of Alpha to build an end-to-end prototype of a Pensions Dashboard service and to develop the cross-organisational governance structure.

The intention is to maintain and build momentum, delivering a first alpha service which is iterated and improved through a private and then public beta in 2017 before becoming a 'live' service.

# 1. Project Objectives

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This project is conducted under the Open Identity Exchange (OIX). OIX is a non-profit trade organisation of market leaders from competing business sectors driving the expansion of existing online services and the adoption of new online products.

The principles of collaboration and transparency are at the heart of OIX projects which focus on the needs of users and to work with willing organisations that want to develop open standard based services.

## Discovery Phase

In 2015 a discovery project (OIX 2015) with participants from industry, consumer bodies and Government was conducted to address the problem of 'lost pension pots'. Previous modelling commissioned by the DWP in 2010 (Johnson, P et al, October 2010) shows that on average, individuals will work for 11 employers during their working life. With automatic enrolment, this will result in more people acquiring multiple pension pots.

The project tested the following hypothesis:

*'Consumers will take action and make informed choices when they are provided with information and data about their pension savings & investments and the associated retirement benefits or income in later life through a secure, easy to use digital service.'*

The findings demonstrated that matching people with their defined contribution pension pots and presenting the results in a dashboard were important to consumers and could lead to changing their behaviour when engaging with pensions. There was agreement to progress to the next phase of the project or "alpha" to deepen our understanding of finding and matching people with their pensions.

## Alpha Phase

The Alpha Phase officially started in February 2016, with 14 organisations representing the views of consumers, the financial services industry and the Government. The project group felt wider engagement was important, and HM Treasury, DWP, FCA and the Pensions Regulator were kept informed of the project; over 50 people attended a show and tell session in April 2016; and eight industry bodies were engaged during the project.

This phase concentrated on aggregating a comprehensive picture of people's accumulated pension savings including defined benefit pensions and defined contribution pensions alongside the State Pension. The State Pension is of particular importance since it is the foundation of many people's retirement savings and makes a Pensions Dashboard universally relevant.

The core project focused on the following areas: customer journeys, consumer research, architecture and data standards, policy and governance.

This OIX white paper reports the findings of its first phase of Alpha.



## 2. Pensions Landscape

Pensions provision is changing and individuals must increasingly take their own responsibility for planning ahead to ensure their financial well-being in retirement. For many, automatic enrolment is providing the means to do this, but more needs to be done to support the shift towards a more saving-oriented culture and to enable informed decisions around planning ahead. In particular, consumers need access to clear and holistic information about their retirement savings.

### The importance of pensions

Over the last 30 years, a number of factors have conspired to increase individual responsibility for retirement decisions and the importance of pension saving. These include:

- **Increasing longevity.** Since the mid-1980s, average life expectancy has risen by approximately two years every decade (ONS, 2015a). While steps have been taken from the early 1990s onwards to address this through equalising and then raising State Pension age, wider acceptance of later retirement is spreading only slowly<sup>2</sup>
- **Demographic bulge.** As the 'Baby Boom' generation born between 1945 and 1965 (ONS, 2015b) reaches retirement, this puts cost pressure on both the State Pension and private defined benefit schemes.
- **Shift to defined contribution schemes.** Apart from the factors above, others, such as increased regulation, a low interest-rate environment and volatile equity markets, have triggered the closure of many private-sector defined benefit schemes with a shift instead towards defined contribution schemes (ONS, 2015c).
- **Pension Freedom and Choice.** This change in policy (Pension Schemes Act 2015; Taxation of Pensions Act 2014) has opened up wider options for individuals in the way they can use their pension savings, including for purposes other than retirement income.

As a result, individuals have had to start taking greater personal responsibility for making adequate saving to fund the retirement lifestyle they would like. However, behavioural traits, such as, myopia and hyperbolic discounting<sup>3</sup> (DWP, 2009), tend to work against such forward planning and, to tackle this, 2012 saw the start of a new policy of automatic enrolment into workplace pension schemes. This places a duty on employers to enrol eligible workers into a workplace pension and contribute something towards it on their behalf, although eligible workers have the choice to opt out.

Surveys suggest that automatic enrolment is proving successful, with an additional 6.2 million starting to save for retirement between 2012 and April 2016 (TPR, 2016). Overall, 56 per cent of UK adults are now deemed to be saving adequately for retirement compared with 46 per cent in 2012 (Scottish Widows, 2015 and 2012). However, one in five UK adults are still saving nothing towards retirement and a further 12 per cent are '*seriously under-saving*' (Scottish Widows, 2015, p.11).

While the take-up of automatic enrolment is good news, it creates a different problem, with many of the new savers likely to build up multiple small pots or pensions as they move from job to job. Previous modelling commissioned by the DWP (Johnson, P. et al, 2010) showed that the average individual has 11 different employers over his or her working life. The government previously has estimated that this could contribute to an estimated 50 million dormant defined contribution pension pots by the middle of the century, with around 12 million being worth less than £2,000<sup>4</sup> (DWP, 2012).

To address these issues of under-saving and multiple pensions, there is a pressing need for consumers to have a straightforward way to assess whether they are saving enough for the retirement they want and an accessible method of keeping track of pensions from multiple sources.

2 For example, an annual survey by Scottish Widows (2015) found that UK adults of all ages still typically want to retire at age 63, though would be prepared to work until age 67 if 'absolutely necessary' (p.5).

3 Myopia is the tendency to focus on short-term gains regardless of long-term costs. Hyperbolic discounting can cause preferences between options many years ahead to reverse when the same options are presented in the short-term.

4 In 2012 money terms.



## Consumer engagement with pensions

There is some evidence that, since the introduction of automatic enrolment, many consumers have become more realistic about their pension goals with a fall in average target retirement income of around £2,000 (Scottish Widows, 2015).

However, there is a divide between those who are saving enough and have a pretty good idea of the pension pot they need and those who are not saving enough and greatly underestimating the scale of the task (Scottish Widows, 2015). This is borne out by a survey for Aviva (2015) which found that more than half of people aged 55 and over underestimated the pension pot that would be required to replicate the state pension with 15 per cent thinking that £25,000 would be enough against the true figure of around £218,000.

Currently, the main way in which individuals are kept informed about the size of their pension pots and likely pension income is through benefit statements. However, the provision of these and the information they provide varies:

- **State Pension statements.** These are available on request by phone, post or online. They show the amount of State Pension the individual may get based on their current National Insurance record. In the six months to May 2016, 400,000 people had requested a statement, double the rate for the previous year. In addition, in February 2016 a new online service called “Check your State Pension” was introduced in beta on GOV.UK. This service allows working age individuals to view their State Pension statement. As of April 2016, there have been 300,000 unique page views of the forecast page (DWP et al, 2016).
- **Defined contribution scheme statements.** These must automatically be issued annually to active and deferred members. They show, amongst other information, the size of the pension pot built up so far. In addition, these schemes must issue an annual Statutory Money Purchase Illustration (SMPI) to all members with pots over £5,000 which shows the amount of pension (in today’s money) likely to accrue to the member built up so far based on specified assumptions. (Occupational and Personal Pension Schemes (Disclosure of Information) Regulations 2013, article 17 and Schedule 6)
- **Defined benefit scheme statements.** These must be issued to active and deferred members on request (Occupational and Personal Pension Schemes (Disclosure of Information), Regulations 2013, article 16 and Schedule 5). In practice, most schemes issue statements annually to active members. Often, these are just a record of years of membership in the scheme and the member needs to visit the scheme website to use an online tool that translates this into possible pension (expressed in today’s money).

There are some publicly available, independent tools (for example, Money Advice Service 2016, Age UK 2015) that enable individuals to enter the data gleaned from their benefit statements and explore whether they are on track for their retirement income goal and how changing the goal, retirement age and/or amount saved may improve the situation. Many, but not all, providers and schemes offer their own tools which allow an individual to monitor one specific pension and may offer the facility to transaction online. However, take-up relies on consumers actively finding or being signposted to such tools.

There is no automatic signposting to forecasting tools on benefit statements. Pension providers and schemes dealing with requests under Pension Freedom and Choice are required to signpost to the government’s public guidance service, Pension Wise (FCA, no date, COBS 19.4.5; TPR 2015), but this site does not include interactive tools.

Perhaps unsurprisingly then, a recent survey (Which? 2016) found that 47 per cent of personal pension scheme members aged over-50 are not confident about their pension savings and more than 20 per cent have never checked the value of their pension pot. In addition, 37 percent of respondents said they found it hard to keep track of their pensions.

Consumer expectations are changing, with more people accessing financial information and services online. The take-up of online banking and bill-paying might indicate ability and willingness also to engage with pensions online. The most recent Ofcom (2016) survey shows two-thirds of UK adults bank and pay bills online, although take-up reduces with age. Seventeen per cent of 55 to 64 year olds say they never use the internet, compared with just 5 per cent for the under-55s. British Bankers Association World of Change Report (2015) reveals there is widespread growth in online personal banking with 9.6 million daily log-ins to internet banking, with 10.5 million banking app logins with £2.9 billion was transferred each week using banking apps alone (BBA 2015).

## Recent developments in pensions policy and the market

The UK has a strong focus on delivering financial services through competitive markets and central to this are capable, engaged and active consumers.

The UK is also a world leader in promoting financial capability and has had a national financial capability strategy since 2006 (FSA, 2006). The current strategy (Money Advice Service, 2016), overseen by the Financial Capability Board, places ease and accessibility of financial services high on the capability agenda and it is here that the Pensions Dashboard proposals sit.

However, enhancing the nation's capability in the area of retirement planning is a challenge, given multiple demands on household finances and the behavioural traits, mentioned earlier, that tend to make us all prioritise today over the future. Automatic enrolment was introduced to override these barriers, through the use of behavioural nudges, and so raise the priority of retirement saving particularly at earlier ages.

Although the evidence suggests that automatic enrolment has been successful in raising the number of people now engaged with pension saving, challenges remain, in particular:

- Reducing the level of opt out among employees working with smaller employers. The average level of opt-out has been running at 9 per cent but rose slightly in 2014 as medium-sized employers started to be included (DWP, 2015). Other research (ACA, 2015) predicts that opt outs could rise as high as 20 per cent when employees of small employers are automatically enrolled. Opt-outs tend to be higher among younger employees and those on a low income (DWP, 2015).
- Encouraging those who do save to save more. The average contribution (employer and employee combined) to defined contribution schemes has fallen since automatic enrolment started, suggesting that new savers are tending to benefit only from the minimum required contribution rates (DWP, 2015). This makes it all the more important to provide savers with information, if it may prompt increasing their own contributions.
- Reaching those outside the scope of automatic enrolment, particularly the self-employed and those who work part-time (often women) and so are more likely to have income below the automatic enrolment earnings threshold.<sup>5</sup>
- Tackling the problem of multiple, small pension pots. The previous Coalition Government had intended to introduce a policy of 'pot follows member' so that small pension pots (say, below £10,000) would automatically be transferred to a new scheme when an employee changed employer. Enabling legislation was included in the Pensions Act 2014 (section 33 and Schedule 17). In autumn 2015, the policy was put on hold given the priority of implementing automatic enrolment, the new State Pension and the pensions freedoms (Altmann, 2015). The Pensions Dashboard offers a way to encourage members to consolidate their pension pots.
- Increasing savings overall – despite automatic enrolment, household savings rates in the UK have continued to decline and have now hit a fifty year low of 3.8pc (ONS 2016).

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5 £10,000 a year in 2016-17.

Engagement with retirement planning increases with age, reducing the need for nudge-type policies, Pension Freedom and Choice lets individuals make their own choices about how to use their pension savings when they reach the decumulation stage of retirement planning. This puts the emphasis back on ensuring that those approaching retirement have good financial capability and ready access to the information they need to inform their decisions.

Consumers also need access to guidance and advice if required. However, at present it is often difficult for savers with modest means to find face-to-face regulated advice at a price they are willing to pay or that it would be economic for regulated advisers to provide (HMT and FCA, 2016). Technology may provide the solution through the development of online automated advice services (so-called 'robo advice') and the Pensions Dashboard will tend to support these developments by enabling comprehensive, standardised data to be transferred directly (with the individual's permission) to automated advice services.

The Government has given added impetus to the Pensions Dashboard project by announcing in Budget 2016 that it should come on stream by 2019 (HMT, 2016).

The 2016 Budget (HMT, 2016, paras 1.108 – 1.112) also announced a new savings initiative: the Lifetime Individual Savings Account (ISA). This provides an alternative incentivised method of retirement saving for individuals under age 40. Consumers are already tending to view retirement saving through a portfolio approach, with a blurring of the lines between pensions and other forms of saving (PLSA, 2016). This includes residential property, with one in six people who have not yet retired saying that they plan to sell or rent out property to help pay for their retirement (Barings, 2014). It follows that, ideally, the Pensions Dashboard technology should be developed with sufficient scope to eventually cater for alternative forms of saving as well as pensions.

### 3. Pensions Dashboard Model

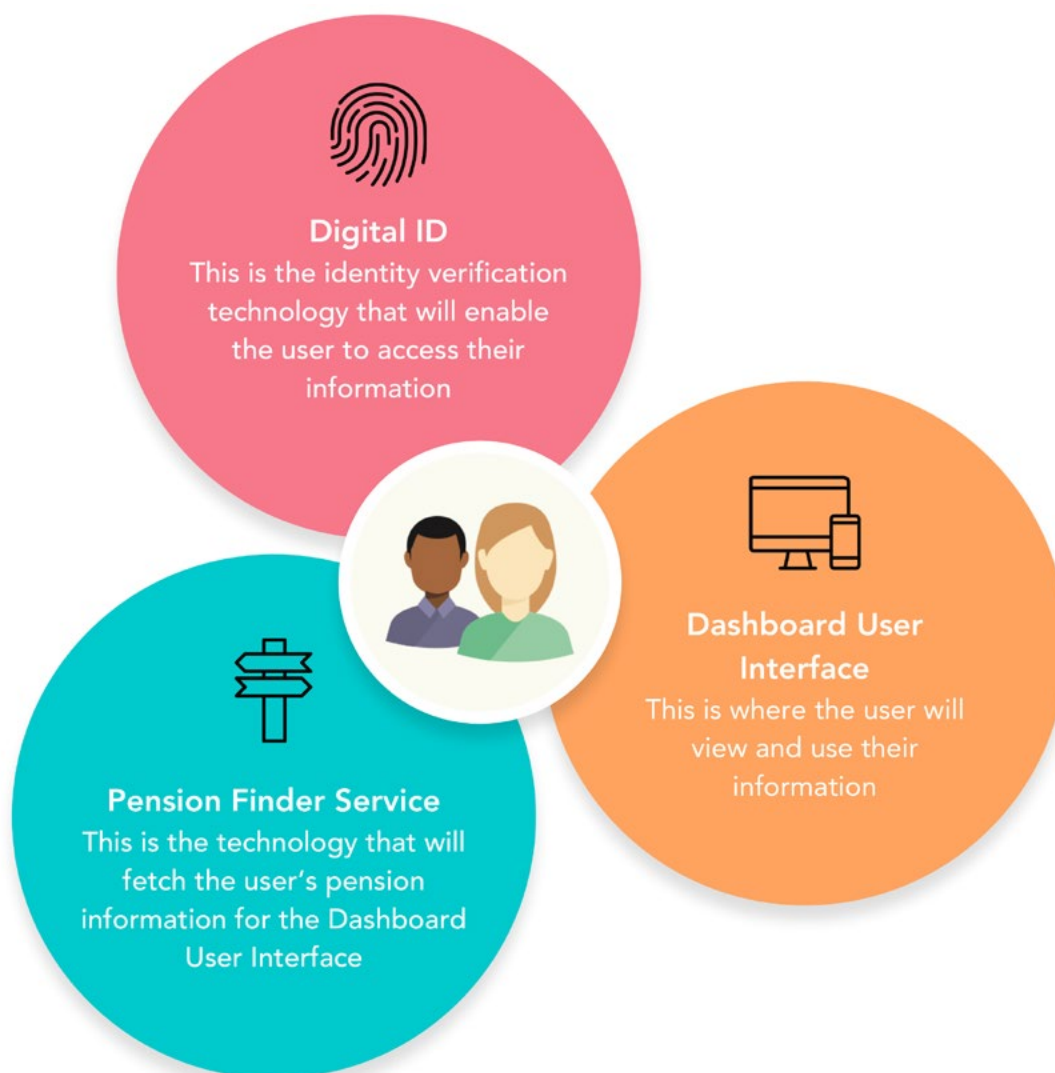
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When we talk about a Pensions Dashboard, we are referring to free-to-consumer online resource that enables people to check their pension savings. The aim is to help them ensure they have enough income to live on when they retire and to easily keep track of multiple pensions.

The resource comprises three core components:

- **Digital Identity (ID):** the identification technology that verifies the user's identity before they can access their data.
- **Dashboard User Interface (UI):** the set of screens, menus and commands through which the user views their information and may carry out tasks based on it.
- **Pension Finder Service (PFS):** the technology that facilitates the find and collection of information from pension providers and delivers it to the User Interface.

**Figure 3.1: Core components of the Pensions Dashboard**



## Digital Identity (ID)

The Pension Dashboard will require a secure identity verification solution, such as GOV.UK Verify. This is a new way for people to prove who they are online, enabling quick and easy access to government services like filing a tax return, viewing driving licence details or checking their State Pension. It was launched in beta in 2014 and became a live service in May 2016. People accessing public services through GOV.UK Verify are now able to create a secure 'Digital ID' with one of eight different companies certified to government standards. Once a user creates a verified identity account with their chosen certified company, they can use it to access an increasing range of government services.

The expectation is that a Digital ID - like that offered by GOV.UK Verify - will be used as a means for people to securely login to the Pensions Dashboard and provide their personal details in order to access their pensions data. Anyone wanting to use the Pensions Dashboard will either need to go through the process of creating a secure Digital Identity or use an existing one from previous dealings with government services. Work to align the login mechanisms of existing pensions providers with the new Digital IDs created to government standards has not been conducted as yet.<sup>6</sup>

Maintaining the trust and integrity of Digital IDs is of greatest importance. GOV.UK Verify has been designed in consultation with the Privacy and Consumer Advisory Group (PCAG), a forum of experts set up to provide independent advice to the Government on personal data and privacy issues (Cabinet Office, 2015). The PCAG has developed a set of principles against which digital services can be aligned. The Cabinet Office is working with organisations in the private sector, including financial institutions, to consider the practicalities of private sector re-use. Any controlled expansion of GOV.UK Verify beyond the public sector will be designed around people's needs and in consultation with the PCAG.

Unlike the other two components, Digital ID relies on separate, third-party software utilised by, but not created for, the Pensions Dashboard and, aside from the technical considerations for integration, the Alpha Phase has not played a role in developing the Digital ID service. This is a crucial dependency for future Pensions Dashboard development and needs to be properly integrated into the programme of work.

## Dashboard User Interface (UI)

The Dashboard User Interface is where consumers will be able to view their pensions data through mobile and desktop devices and carry out tasks using it.

The user experience that consumers receive through the Dashboard User Interface will play a key role in gaining their trust, fostering engagement and helping them to understand a complicated subject matter area. Therefore, it is vital that consumer needs are placed at the heart of the interface development.

There are three options for the way the Dashboard User Interface can be provided to consumers. These are explored in Section 4 below.

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<sup>6</sup> An important aspect of the user experience of the white-label journey is Single Sign-On, which means a user who is already logged into their pension provider or bank website, will be able to access their dashboard without having to complete a second login process. In practical terms, to enable a Single Sign-On experience, providers hosting a white-labelled version of the Pensions Dashboard will either need to adopt Verify Digital ID for their identification and verification process or the provider login solutions are validated (and accredited) to provide the same service. This will be an area of investigation for the next phase of this project.

## Pension Finder Service (PFS)

The Pension Finder Service<sup>7</sup> is the component that will provide a request for pension providers to search their records to match their pension data to the user, retrieve their pension information, and deliver it for display through the Dashboard User Interface.

The challenge for the Pension Finder Service is to facilitate the matching of users with all their pensions (State Pension and private pensions, both defined benefit and defined contribution), based on the personal details obtained through their Digital ID and additional details entered by the user. Where, due to incomplete or changing details, a match is not exact but is a close match, there will be a process facilitated through the Pension Finder Service to acquire additional information in order to confirm an actual match.

The other challenge for the Pension Finder Service is to orchestrate pension valuation requests in order to provide consumers with the values of their pensions on their dashboard.

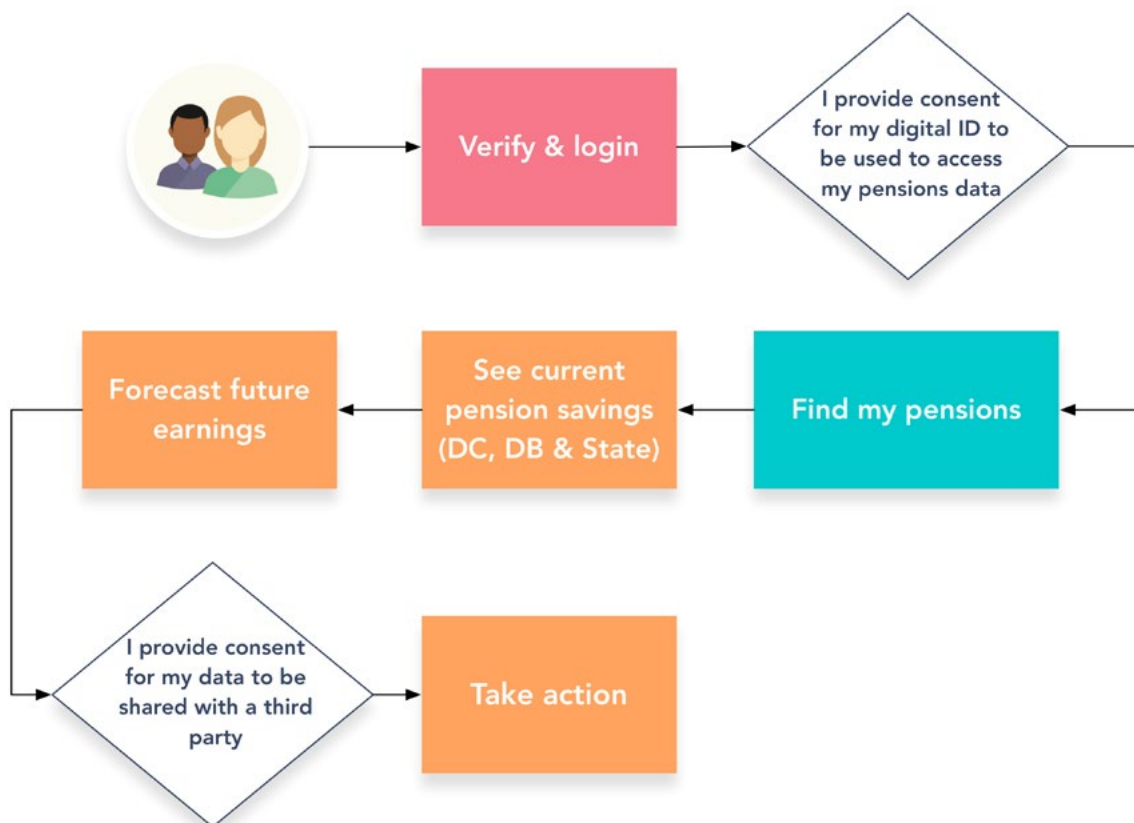
The viability of the Pensions Finder Service will be determined by its ability to securely share data across a number of organisations, which will require well managed governance around open standards (formats that support the sharing and re-use of data) and data protection.

There are different architectural options for the Pension Finder Service, with some relating to the different Dashboard User Interface options, while others concern the way data is remembered, along with data protection and governance matters. These options are discussed in Section 6 below.

## Core Consumer Journey

The combination of Digital ID, Dashboard User Interface and Pension Finder Service will enable consumers to complete the high-level journey shown in Figure 3.2.

**Figure 3.2 Core consumer journey**



<sup>7</sup> This should not be confused with the current Pension Tracing Service, which is the Government free service for finding the contact details of previous pension schemes.



Digital ID will be used for the login and identity verification process. The Pension Finder Service will use details of the user to find and present their pensions information. The Dashboard User Interface will enable users to interact with the Pensions Dashboard to instigate the 'Find my pension' process, see their pensions information and forecast future income.

Any resulting actions from using the Pensions Dashboard are likely to be taken with pension providers, independent financial advisers and/or guidance services outside the Pensions Dashboard.

Within the core journey are a number of sub-journeys for specific tasks. Currently these include:

- **Within Find my pensions:**
  - **Close matching.** The user is invited to supply additional information to determine whether a non-exact match is an actual match.
  - **Trace a pension.** If a pension the user had expected to see on their dashboard has not appeared, the user can provide information to enable the Pension Dashboard to search for the pension.
- **Within See current pensions:**
  - **View details on each pension found.** The summary details will include the name of the scheme, value of defined benefit pensions and value of defined contribution pots. 'View details' will expand on this, for example, including an estimate of the amount of pension a defined contribution pot might provide.
- **Forecast future income.** This will enable the user to explore the effect of combining different pension age, target retirement income and level of saving in order to eliminate any shortfall between the retirement income they can expect and the income they have as a goal.
- **Export and/or share my data.** This is where the user can give permission to share their data from the Pension Dashboard, for example, with a provider or financial adviser.



Figure 3.3 Sub-Journeys

Find pensions journey



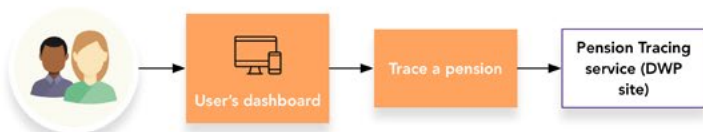
View pension details



Close match journey



Trace a pension journey



Share data journey



Add a pension



Forecast my future income journey



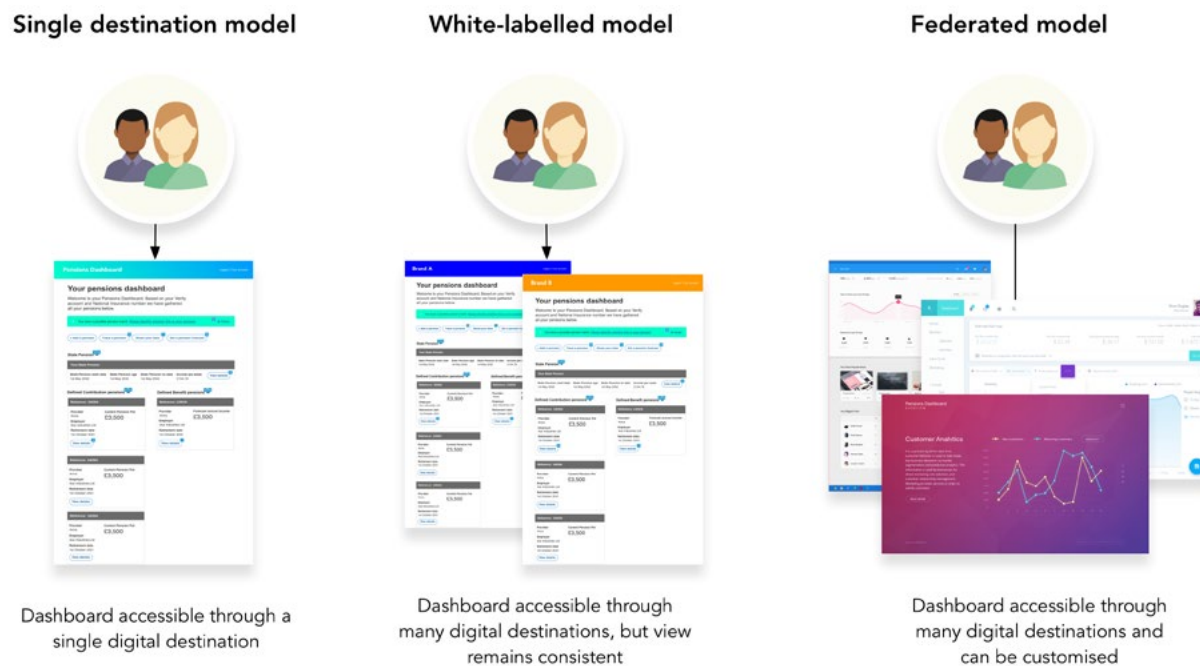
## 4. Dashboard User Interface Options

As indicated in Section 3 above, there are three options for the provision of the Dashboard User Interface. This section explores each option in more detail and reviews their comparative advantages and disadvantages in terms of user experience and business benefits.

The identified options are:

- **Option 1: single destination model.** There would be a single Dashboard User Interface and this would be accessed through one source which could be a consumer guidance brand.
- **Option 2; white-labelled model.** Again, there would be a single Dashboard User Interface, but this could be white-labelled and accessed through multiple financial services brands (such as banks, pension providers, financial advisers, fintech startups and not-for-profit organisations).
- **Option 3: federated model.** This would allow for multiple Dashboard User Interfaces, so that each provider could customise the interface and user experience to suit its own customers.

Figure 4.1 Dashboard User Interface options



## Option 1: Single Destination Model

With this option, the Pensions Dashboard would only be accessible through one website, operated by one organisation. The organisation could be an independent, not-for-profit body set up specifically for the task. Alternatively, it could be managed by one of the existing (or proposed) consumer guidance bodies.

### Advantages

- **Trust.** Perceived levels of trust amongst consumers are likely to be higher for an independent rather than commercial organisation (for example, ‘they won’t try to sell me something’).
- **Consistent user experience.** Consistent branding and user experience may provide reassurance and build confidence amongst consumers when dealing with a complex subject area.
- **Ease of governance.** This would be simpler and regulation overheads are likely to be lower than for multiple user-interface options.
- **Controlled development.** Provides a controlled environment for building and testing, without compromising on quality and risking reputational damage through data breaches.

### Disadvantages

- **Consumer awareness.** Marketing costs for user acquisition could be higher, particularly if delivered through an organisation with low or no consumer brand-awareness.
- **Ease of funding.** It may be difficult to develop a method of apportioning funding that firms find acceptable when development and running costs are centralised.
- **Competition and innovation.** The centralised model rules out competition and so limits innovation and commercial viability.

## Option 2: White-labelled Model

In this scenario, consumers would be able to access the Pensions Dashboard through a variety of organisations, ranging from their bank, pension provider or financial adviser.

However, the information and layout of the Pensions Dashboard would be consistent regardless of the website used to access it, and the hosting organisation would not have access to the individual's data being displayed on their dashboard, unless the user chose to share their data with that organisation to make use of services they provide.

### Advantages

- **Customer awareness.** Distribution through destinations already frequented by consumers dealing with their money matters provides a cost-effective alternative to promoting a single destination brand, resulting in reduced marketing costs.
- **Consistent user experience.** Consistent layout and information on each dashboard, helps consumer confidence and reassurance when dealing with a complex subject area.
- **Ease of governance.** Governance remains simple, with centralised control of the information that is being displayed on the Dashboard User Interface.
- **Competition and innovation.** The host sites would be able to innovate the customer journey with additional value-added tools that would complement the white-labelled dashboard.
- **Controlled development.** Since the development is controlled from a central environment, it results in lower development and running costs for UI providers.
- **Reduced marketing spend.** There will be reduced marketing costs for Option 2 since the dashboard is integrated into known consumer brands.

### Disadvantages

- **Trust.** There are potential trust issues amongst consumers if they are not clear on the relationship between the organisation (bank, pension provider) through whose website they are viewing their Pensions Dashboard and the data being provided.
- **Ease of funding.** As with Option 1, this model still depends on a centralised organisation for development and management of the white-labelled user interface product, which may make it difficult to develop a method of apportioning funding that firms find acceptable.
- **Ease of use.** If consumers are required to login twice (once through the financial service provider's login and then through the Digital ID) it would be detrimental to the overall experience. This is dependent on whether a Single Sign-On experience can be provided (discussed later in this paper).

## Option 3: Federated Model

This option would allow individual organisations to create bespoke versions of the Pensions Dashboard to meet the more specific needs of their target audiences, albeit with some level of governance and rules on how the data is displayed and described. Architecturally, the key difference would be individual Dashboard User Interfaces with providers utilising their own digital infrastructure and their own methods of integrating Digital ID verification.

### Advantages

- **Competition and innovation.** This model enables open competition and the freedom to adapt is more likely to drive innovation in dashboard presentation, potentially leading to better dashboard experiences that resonate with difficult-to-engage audiences, such as younger savers.
- **Ease of funding.** Development, running and marketing costs are distributed across the different Dashboard User Interface providers in line with demand from financial service organisations that want to have a Pensions Dashboard.

### Disadvantages

- **Lack of consistent user experience.** Lack of consistency between different dashboards could hamper consumer confidence and further complicate an already complex subject area.
- **Ease of governance.** Higher governance overheads required to ensure dashboards do not omit important information that would otherwise prevent a user from making a detrimental decision.
- **Trust.** Consumers may have issues with trust, suspecting the motives of the companies involved and unwelcome access to their personal data.

## 5. Consumer Research

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*“I just keep them in a drawer. I actually wanted to do it online so that I could maybe get more sense of it and get more insight into it, but it’s just something I’ve not got round to yet. [...] I do banking online, so I, kind of keep a tally of what’s going on there. So maybe if that were online I could maybe explore it a bit better and make more sense of it”*

Glasgow, 38, squeezed

During the Discovery Phase, the project team commissioned consumer research to test the concept of the Pensions Dashboard. To build on the initial findings, further consumer research was carried out during the Alpha Phase. The main results are discussed in this section and further details of the methodology can be found in Appendix II.

The aims of the consumer research were to further validate the concept of the Pensions Dashboard and to dig deeper into different aspects of the customer journey, in particular:

- People’s views about their need for, and the potential benefit of seeing all of their pensions savings (including State Pension) in one place.
- Individuals’ trust and confidence in different Dashboard User Interface options.
- Reactions to different levels of data consent and data sharing.
- Reactions to the core journey and sub-journeys, such as pension matching, tracing a pension and getting a forecast, including a phased build-up of the dashboard.
- Actions people might take after using the Pensions Dashboard.

The research consisted of 24 one-to-one depth interviews, spread across London, Birmingham, Cardiff and Edinburgh. Respondents were split evenly across two segments of the Money Advice Service segmentation model (*Squeezed* and *Cushioned*). To reflect attitudes of people at different stages in their working life, one third of respondents were aged 55-65 and two thirds 30-54. Full details of the methodology and an overview of the Money Advice Service Market Segmentation model can be found in Appendix II.

### Need and potential benefits

*“I think it’s a brilliant idea. I think it’s a very, very good idea. I think it can’t come quickly enough for a lot of individuals, and I’d certainly sign up to this tonight because I think it’s just giving you easy access to something that, at the moment, I think a lot of people are a bit vague on”*

Cardiff 48, cushioned

Despite low levels of confidence regarding the pensions landscape as a whole (pensions are often seen as *‘more complex these days than in the past’*) respondents tended to say they understood their own pension situation fairly well.

Many had at least a vague awareness of the current pension arrangement with their employer, if not a specific idea of the value of their pension(s) or their monthly contributions.

However, there was often some uncertainty regarding the long-term benefit of saving for a pension – many respondents said that they see property as a safer and more lucrative long-term investment than a pension.

General discussions about retirement planning revealed three key findings, regarding the potential usefulness of the Dashboard:

- Respondents' current planning for retirement often takes the form of a relatively passive monitoring process, rather than an active or sophisticated management.
- The Dashboard is most likely to be useful to the young (aged 30-54) who are often struggling to come to terms with how to manage their pension and the complexity of accessing information about it.
- There was often an unprompted acceptance of 'lost' pensions and the idea that these will never be found again, highlighting the importance of including the 'tracing a pension' and 'matching a pension' functions in the final Dashboard.

*"I think it'd be very useful. I think it ticks a lot of boxes in terms of people accessing the basic and even some not so basic, information about where their pensions are. I like the tracing service. Simple. It's online. It should be. It shouldn't be a manual process now."*

Cardiff, 45 squeezed

When the idea behind the Pensions Dashboard was introduced, respondents were overwhelmingly positive. Younger participants found it a particularly appealing proposition. Even though they are further from retirement many recognised that the Dashboard has the potential to prompt more active management of their pension savings. Some pointed to the role that mobile banking apps have played in helping them to manage their money and believed a Pensions Dashboard could have a similar, positive effect.

Unprompted, the aspects that tended to be considered of most use were:

- The ability to view all pensions in one place.
- The tracing and matching facilities, allowing people to find pensions they may have lost.
- The forecasting tool, allowing people to gain a clearer understanding of how their current saving patterns will impact on their retirement.

## Trust and confidence

*"I just probably wouldn't arrange my pension through a bank. So I'd look at that and think – I don't know. I'd think, 'How have they got my information if I'm not, got my pension with them?'"*

Birmingham, 45, cushioned

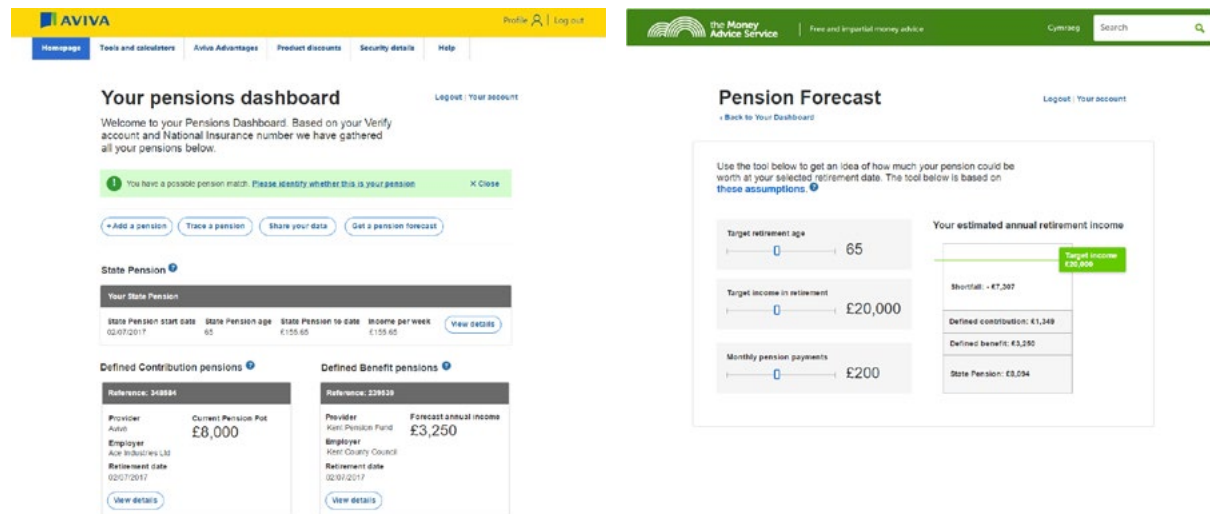
Three different models of the Dashboard User Interface were presented to respondents:

- **Option 1: single destination model** A dashboard accessible through a single website (such as a consumer guidance brand).
- **Option 2: white-labelled model** A dashboard accessible via different websites (banks, pension providers), with consistent layout, wording and information, but different branding.
- **Option 3: federated model** A dashboard accessible via different websites, each with its own layout, wording and branding.

Options 1 and 2 were tested using clickable prototypes, not connected to any real data, that gave respondents an idea of the look, feel and functions that a Pensions Dashboard might offer. Figure 5.1 shows examples of the screens used.



Figure 5.1 Examples from Dashboard User Interfaces tested



There was a clear preference for the single destination Dashboard User Interface model.

There was an anticipation or implicit assumption that any single destination model would be run by the Government or a government-backed service. Respondents said they would have a greater level of trust in a service run in this way rather than by private sector providers, because of expectations that the Government would not use personal data for commercial gain.

Individuals believed a single destination dashboard would be more likely to encompass all of an individual's different pensions. Many felt that a dashboard accessed via a provider website would show only pensions held with that provider.

The white-labelled model was seen as a potential alternative by some respondents – particularly those who are already users of online banking and who would value the ability to check the status of their pensions while checking on their bank accounts. However, there were still underlying concerns about data privacy, which would need to be addressed through the user experience.

More respondents expressed scepticism regarding the white-labelled model than for the single destination model. They struggled to accept that the provider offering access to the dashboard would not be able to view the information contained within the dashboard, despite reassurances to the contrary.

The third option of a federated model was widely disliked. The anticipated inconsistency of format was seen as a hindrance to facilitating greater understanding and ease of management. One respondent suggested that this model would lead to greater innovation, but this was a minority view.

*“There are disadvantages if you got all the different platforms and then they’re all build in different ways. It could be complicated as to how you walk around it”*

London, 44, cushioned

*“I think it’s better to have consistency with something like that, because it is a personal thing, your pension, so I’m not sure if each of them having different ways of presenting the same information would be a good option, to be honest with you...”*

Cardiff, 45, squeezed

## Data and consent

*“It’s pretty standard. Even silly sites like Amazon you have to verify everything and have your passcode”*

Birmingham 59, cushioned

The proposed registration process was widely seen as straightforward, reasonable and in line with customer expectations.

Respondents were happy to enter their National Insurance number and didn’t believe this to be an inconvenience. In fact entering the National Insurance number actually helped understanding of how the Pensions Dashboard might work by giving an idea of how their pensions data would be retrieved (even though the National Insurance number is not in fact used by every pension provider).

Consent was not an issue for any of the respondents, with the main concern being that their personal details should not be passed onto other organisations for marketing purposes. This concern was mitigated by the consent text.

*“That’s fine. If it’s not shared and not sold on to people that are going to start phoning you.”*

Glasgow, 38, squeezed

## User experience: core journey

*“That looks okay to me. Obviously there’s a lot of information being shown straight away. You’ve got your occupation and everything, but yes, it’s just the setup of the pages, it’s near enough the same as a bank statement really.”*

Birmingham, 54, cushioned

In general the main dashboard page met expectations. After an initial central view of the dashboard, respondents were introduced to a detailed view containing more information for each individual pension (see Figure 5.2).

Figure 5.2 Example of detailed pension information in the Pension Dashboard

The screenshot shows the 'Pension Details' page of the Money Advice Service. At the top, there is a green header with the Money Advice Service logo, the text 'Free and impartial money advice', and a search bar. Below the header, the page title 'Pension Details' is displayed, along with links for 'Logout' and 'Your account'. A link to 'Back to Your Dashboard' is also present. The main content area features a table with pension details for a specific plan (Reference: 348584). The table is organized into three columns: Provider, Date of birth, Current Pension Pot, Employer, National insurance no, Forecast annual income, Scheme type, Marital status, Valuation date, Retirement date, Membership date, and Additional details. At the bottom of the table, there are three buttons: 'Contact provider', 'Export your data', and 'Share your data'.

Reference: 348584		
<b>Provider</b> Aviva	<b>Date of birth</b> 02/07/1953	<b>Current Pension Pot</b> £8,000
<b>Employer</b> Skyor	<b>National insurance no</b> QW 25 75 89A	<b>Forecast annual income</b> £430
<b>Scheme type</b> Defined Contribution	<b>Marital status</b> Married	
<b>Valuation date</b> 03/04/2016	<b>Retirement date</b> 02/07/2017	
<b>Membership date</b> 17/5/2004	<b>Additional details</b> Guaranteed annuity rate (GAR)	

Buttons: [Contact provider](#) [Export your data](#) [Share your data](#)

For many, the detailed view was useful, although it often prompted more questions than answers. In particular some respondents had concerns regarding the definition of key terms such as 'valuation date', 'GAR' or 'State Pension to date'. It will be important to provide further information regarding unfamiliar terms when the dashboard is developed further.

Respondents also tended not to notice the difference between the different pensions in terms of figures displayed – i.e. per week, per year and total value of pot. Ideally, consistent values would be provided although the challenges of estimating DC income were understood by those respondents with a better understanding of pensions.

### Phasing

*"I don't mind waiting, do you know what I mean, I've got 40 odd years, I can wait. If it's going to happen then that's fine, I don't mind I've got plenty of time to wait."*

Glasgow, 38, squeezed

When the possibility was raised that the launch of the Dashboard and underlying data may well be phased, meaning that people may not be able to see all their pensions from day one, reactions tended to be positive. Many were not surprised by the fact that information may be added at different times and saw it as a necessary part of any website launch.

The majority view was that they would not be concerned by their information being missing initially, as long as this is clearly labelled and explained.

## User experience: sub-journeys

Respondents were also asked their views about the sub-journeys that the Pensions Dashboard could include to address particular aspects of keeping track, forecasting retirement income and sharing data.

### Matching

*“See if you give your National Insurance number [...] I would have thought it would be pretty accurate if you put your National Insurance number in in the first place.”*

Birmingham, 45, cushioned

Respondents struggled with the matching concept, having the expectation that all their pensions would be automatically matched up. The fact that a level of manual intervention was required created mistrust amongst respondents.

Of the two matching mechanisms tested - online and telephone (see Figure 5.3) - older respondents felt more comfortable with the telephone option, whilst younger respondents tended towards the online mechanism.

Security is important here and with the online mechanism, respondents both welcomed and expected to answer a series of questions to help match them up with their pensions.

**Figure 5.3 Example of the matching process**

The screenshot shows a green header bar with the 'the Money Advice Service' logo, the text 'Free and impartial money advice', the word 'Cymraeg', and a search bar. Below the header, the main content area has a title 'Pension match' and a link 'Logout | Your account'. A link 'Back to Your Dashboard' is also present. The main text states: 'We have a pension that is a close match, but would like you to confirm some additional details to verify the record.' Below this, it says: 'To add this pension to your dashboard choose one of the the following options'. There are two options presented in boxes: 1. 'Enter the postcode you lived at in March 1993' with a house icon, a text input field, and a 'Submit' button. 2. 'Contact your pension provider using the contact details below' with a telephone icon, the text 'Aviva - Tel: 0800 068 6800', and 'Please quote this reference number: QSR34994'. The word 'or' is placed between the two options.

### Exporting and sharing data

*“It’s just about security. Yes, once you are sharing something, you’re putting something else into the mix then, aren’t you? There’s another strand. Export data, yes, but share your data? Not so sure.”*

Cardiff, 45, squeezed

There were mixed views on the exporting and sharing data features. Often the options elicited diametrically different views in younger and older people.

The ability to export data was viewed positively by many older people and did not prompt concerns – in particular this group liked the idea of being able to have their information on paper so they can refer to it later without going back to the website.

The sharing function elicited more cautious views among older people who often expressed reticence about sharing their pension information especially when accessing the dashboard from a bank’s website.

Conversely, younger people appeared more open to the idea of sharing data through the dashboard and often did not see any reasons for exporting data if the sharing function is available.

The main concern that emerged about sharing pension information, especially when the journey is conducted on a bank or pension provider’s website, is that people may become the target of sales calls or other offers.

*“‘Share your data’ – I don’t know what that means, where’s it going? Who are you’re sharing it with? Is it somebody who’s going to be writing to you nearer your retirement age to say ‘Do you want to buy an annuity now that this pensions coming to fruition?’ [...] I wouldn’t click it.”*

Cardiff 55, cushioned

### Forecasting tool

*“I really like the pension forecast. Yes it does what you said it’s supposed to do, and that’s all I want really. I didn’t know I wanted this until I came here, but I do.”*

London, 31 squeezed

The ability to view a forecast of annual income was valued by people as the most practical piece of information contained in the Dashboard and what would ultimately help them make informed decisions about their pensions. For many, this was the most valuable part of the customer journey.

However, from a user-experience perspective there was some confusion about the tool. The text detailing the assumptions on which the forecast is based was rarely looked at or read unprompted and, if read, was rarely examined in detail or understood. Many respondents felt they understood the overall principle that the forecast is liable to change, but were confused by the details.

However, there was a clear understanding among respondents that the income calculated by the dashboard would not be definitive, given fluctuations over time, the effects of inflation and other variables. Positively, this did not decrease confidence in the tool or discourage usage.

## Actions people might take

*“[I would think about] consolidating, maybe upping my contributions because, yes, right now, I mean, I don’t know what I’ll have at retirement age. So, yes, I might discover that I’m not putting in nearly enough, or less than I thought, and so up my contributions, look at other ways to get money for retirement.”*

London, 33, squeezed

The Dashboard was welcomed as an innovation to help people manage their pensions more actively – especially those who are younger and further from retirement expect it would facilitate a significant shift in their interaction with pensions. The Pensions Dashboard was compared to the arrival of online banking, which transformed consumers’ engagement with their money management.

Actions that respondents said they might take after using the Pensions Dashboard were:

- Seeking financial advice.
- Increasing their pension contributions.
- Being more proactive in managing their pensions.

## 6. Pension Finder Service Architecture

The Pension Finder Service is the technology that facilitates the find and collection of information from data providers and delivers it to the Dashboard User Interface. It will interact with a vast array of pension providers to access the State Pension and different defined benefit and defined contribution schemes.

In this section we will look at the high-level architectural layers that make up the Pensions Dashboard, the specific architectural decisions for the Pensions Finder Service that need to be investigated further to overcome the challenges of integrating with different pension provider administration systems and the architectural principles that have been agreed so far.

Figure 6.1 shows the Pensions Finder Service as the central component between the Dashboard User Interface and pension providers.

**Figure 6.1 Pensions Dashboard architecture**

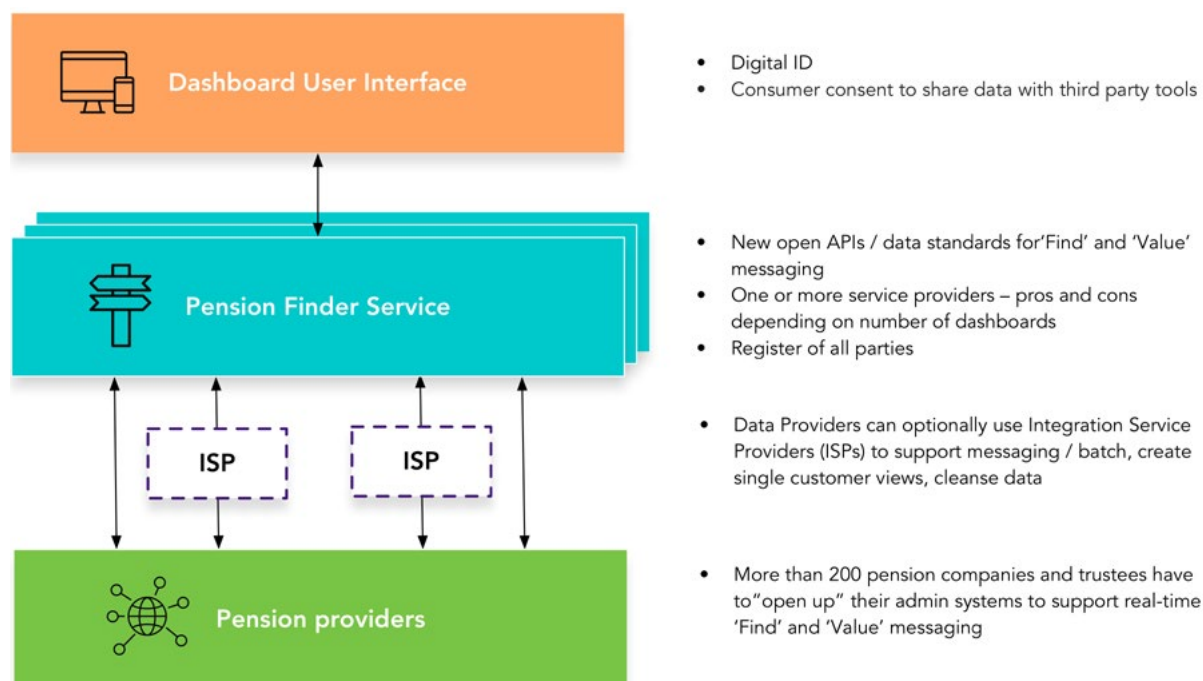


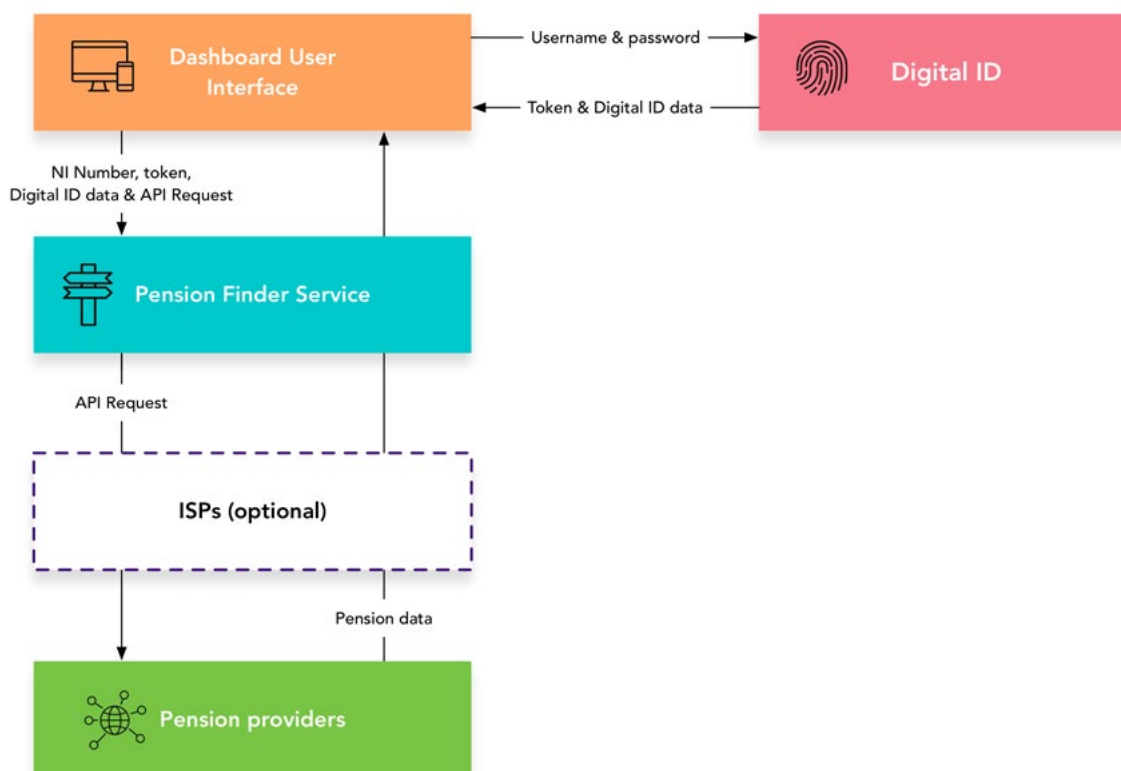
Figure 6.1 also shows an additional optional layer of architecture between the Pension Finder Service and pension providers. These are Integration Service Providers (ISPs). To enable the Pension Finder Service to directly access the data they hold, many pension providers would need to invest in changes to their IT systems. ISPs could be used by pension providers who do not wish to do this.



The term 'Integration Service Provider' (ISP) is very specific to the Pensions Dashboard project and describes technology companies that offer a variety of approaches to integrate pension providers' existing IT systems and data with the Pension Finder Service. To help understand the flow of data through the architecture, Figure 6.2 provides a simplified illustration of the interactions taking place:

- User clicks to login to the Pensions Dashboard using their Digital ID username and password.
- After successful login, Digital ID returns a token and personal data that confirm the user's identity and so clears them to start the dashboard session.
- The Dashboard User Interface passes the user's National Insurance number,<sup>8</sup> token and Digital ID data to the Pension Finder Service.
- The Pension Finder Service then calls on the pension providers or ISPs where pension providers have opted to use them and requests they search for the user's pensions using the information provided.
- The pension providers and ISPs use the information provided by the Pension Finder Service to search for relevant pensions and return the data to the Pension Finder Service, which in turn passes the data onto the Dashboard User Interface for the user to view.

**Figure 6.2 Pensions Dashboard data flow**



<sup>8</sup> User will be asked to enter their National Insurance number (NINO) to help find and match their pensions. As the number is manually entered, there is not sufficient evidence that the NINO is definitely linked to the authenticated individual, so pension providers cannot trust the entry and use it properly for matching. If NINO can be verified from a trusted source (such as the DWP), this allows for a much better automated matching where providers hold NINO on record.

## Architectural and technical challenges

The Alpha Phase of the project enabled the identification of the key technical challenges and decisions that impact on the final design of the architecture. This has led to the adoption of a set of principles to guide future decision making. These principles, which will be ‘owned’ by the managing governance body (see Section 7) are set out in Box 6.1.

### Box 6.1 Pensions Dashboard architectural principles

1. The Pensions Dashboard must be designed first and foremost with the best interests of the consumer in mind.
2. The Pensions Dashboard should encourage competition where competition is consistent with other architectural principles e.g. with the best interests of the consumer in mind, in support of low-cost efficient services.
3. Controls must be in place to ensure that the Pensions Dashboard data access policy is subject to informed consumer consent to appropriate data at relevant points in the process.
4. The Pensions Dashboard should be designed to support future innovation (e.g. additional plan information, additional product types).
5. The Pensions Dashboard must comply with relevant laws and regulation e.g. the Data Protection Act.
6. The Pensions Dashboard must be compliant with the responsibilities of pension trustees.
7. The Pension Finder Service should be ‘dashboard agnostic’ with the aim of supporting one or more Dashboard User Interfaces.
8. The Pension Finder Service open data standards and architecture should support the requirements of the Pensions Dashboard governance model.
9. The Pension Finder Service must adhere to the principles of consumer consent, open data standards and other minimum standards as determined by the Pensions Dashboard governance model.
10. Pensions Dashboard providers and pension data providers will need to be approved and be authorised through governance processes. The relevant data for this will be maintained in a central governance register.
11. The Pension Finder Service must be designed to the highest levels of performance, availability, security and recoverability with supporting service level agreements (to be defined).

However, there are four key areas where more work is required to reach a technical decision and these will need to be a focus for the team developing the Pension Finder Service in later phases. These areas, each of which is discussed below, are:

- Open APIs and data standards
- Data persistence
- Data protection and consent
- Multiple Pension Dashboard Finder services.

## Open APIs and data standards

Data standards ensure that a common format and meaning are used by all participants to enable the straightforward flow of data up and down the architectural layers.

An application programming interface (API) is a means of accessing data based on a standard. Data accessed via an API made be closed, shared or open data. Open APIs based on the agreed data standards will facilitate communication between the Pension Dashboard layers and any organisation fulfilling the role of a Dashboard User Interface provider, Pension Finder Service provider or pension provider. All the providers will need to be able to interact with the Open APIs.

As noted above, some pension providers will interact directly with the Pension Finder Service, while others (especially those without the resources or motivation to develop their own technology) will engage with ISPs, who will be able to explore older data systems and capture and ‘translate’ the relevant data to make it accessible to the Pension Finder Service.

At this stage, no design decisions have been made on the granularity of the Open APIs. For example should a successful request from the Pension Finder Service to a pension provider generate the return of valuation data for the pension policy, as well as basic details, or should the API for finding pensions be separate from that for valuations?

Appendix III outlines the data that would form the basis of new data standards for valuations, distinguishing between the State Pension, defined benefit schemes and defined contribution schemes. Further work will be required for more complex types of pension, such as Self-Invested Personal Pensions (SIPPs) that have multiple asset classes, and these are likely to be phased in at a later stage of the project.

Responsibility for the description and creation of the new data standards will rest with the Pensions Dashboard governance function and it is assumed standards will be provided in single agreed format and supported with documentation on the data standard, developer features and sample APIs.

The project team has agreed a set of principles for the development of open data standards as shown in Box 6.2.

### Box 6.2 Principles for the development of open data standards

1. The Pension Finder Service must use Open Standards which are free-of-charge and fit-for-purpose. In particular, they must be designed so that they are in the best interests of the consumer and also support low-cost efficient services thereby minimising the cost burden placed upon the industry.
2. The Open Standards must be managed by the Pensions Dashboard governance function with professional and robust controls in place. Governance and controls must include industry-agreed change-management and version-management procedures.
3. The Open Standards governance and controls must cater for different rates of adoption of standards and service functionality by a subscribing organisation.
4. The Open Standards must promote consistent results and not be open to misinterpretation.
5. The Open Standards will be created using modern design principles;
6. Existing industry standards should be re-used where reuse is consistent with other architectural principles e.g. fit-for-purpose, in support of low cost efficient services.

The initial creation of the data standards is understood to be relatively straightforward given the small size of the datasets the dashboard will be dealing with and many common attributes across the defined contribution and defined benefit valuation datasets.

## **Data persistence**

'Data persistence' refers to the ability of the system to remember data and preferences entered from previous uses. It plays an important role in the consumer experience, as users will expect to have to enter their details and consent preferences only once.

Data persistence also provides technical benefits in terms of a reduced workload on IT systems below the Dashboard User Interface level, especially given the expected significant volumes of new and returning users.

Enabling data persistence requires the creation of a local data store, which can be referred to as a 'cache'. Future work is needed to determine the architectural layer in which the cache is located, how data will be protected and the most appropriate technical solution for caching the data. These areas are explored in more detail in Appendix IV.

## **Multiple Pension Finder services**

The topic of having multiple Pension Finder Services has been explored during the Alpha Phase. The key advantage is the potential to create competition and innovation, which could lead to lower costs.

However, at this stage, it is difficult to see how multiple Pension Finder Services would provide benefits to consumers and there is also the prospect of greater complexity caused by different organisations doing the same job.

Feedback from pension providers during the Alpha tended to favour a single PFS model, recognising that it would be better for competition to emerge in the Integration Service Providers market.

To allow for future developments, the Pensions Dashboard architecture will be 'agnostic' between the different User Interface models and this has been embedded in the architectural principles (see Box 6.1 on page 30).

## 7. Governance and Funding

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This section outlines governance principles and considers the practical issues of governance and funding that are required to implement this service.

### Principles of governance

Throughout the Alpha Process, project participants have regularly encountered the need for a decision-making body that is independent of Government and of firms' individual commercial interests. It should be collaborative so that it can balance competing interests, accountable and representative so that it can report progress to stakeholders.

It is important that governance is based on a set of principles in which it can effectively deliver its roles and responsibilities. The project team agreed this set of principles as shown in Box 7.1.

#### Box 7.1 Governance Principles

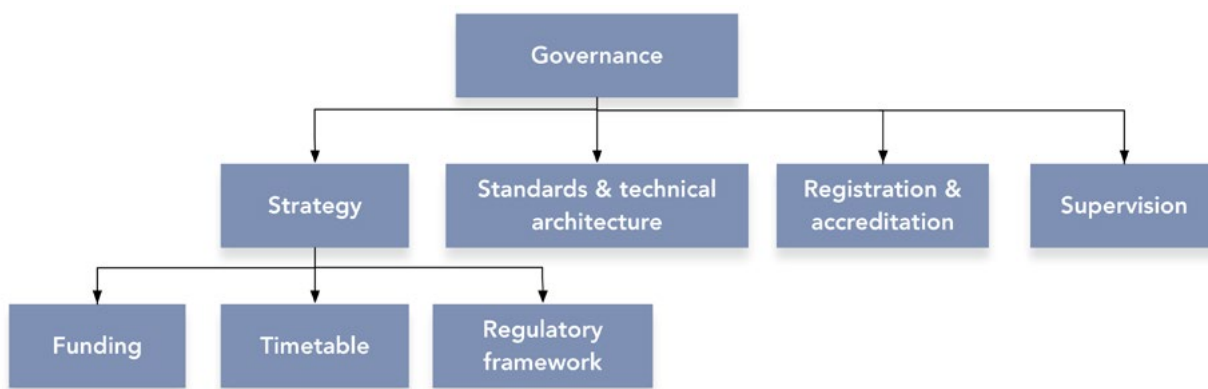
1. Ensure consumer needs are at the forefront of every discussion and decision;
2. Act transparently with clear lines of accountability;
3. Adapt the Pension Dashboard as new technologies emerge and consumer needs evolve;
4. Act with the support of the pensions industry and representative consumer groups;
5. Outline and take steps to mitigate any potential conflicts of interest among participants;
6. Maintain strict cost management procedures at all stages of development;
7. Adopt a risk based approach.

## Governance

There needs to be an overarching structure to oversee the operation, viability and standards of the Pensions Dashboard. Figure 7.1 shows the high-level structure of the governance function, with each area discussed below.

The governance structure should be established with the capability to embrace future changes, such as implementing a white-labelled User-Interface model. This will allow for sufficient scope to expand the role of governance to accommodate different stages of implementation, market changes and advances in technology.

**Figure 7.1 High-level structure of the governance function**



## Strategy

The governance structure should be responsible for setting the overarching strategy for the Pensions Dashboard by developing a plan to achieve its long-term objectives with a clear mission statement.

This will involve setting the timelines for implementation, creating a commercially viable funding model and working on a practical regulatory framework.

The strategy requires the support of the industry, as well as the Government and regulators. Certain features, such as the regulatory framework and the need for legislation, can only be decided by the Government and regulators, but key factors to consider are discussed in Section 8 below.

While the key decisions are to be made at outset, the body should also set and evolve the ongoing strategy for the phasing of implementation, and decide when to make changes on the basis of market feedback and its supervision role – in particular, whether and when to allow alternative Dashboard UIs to use data.

## **Standards and technical architecture**

Section 6 above has raised a range of issues concerning the Pensions Dashboard architecture and outlined a set of architecture principles. These embed open standards for software interoperability, data and documents, which are essential for the functioning of the Dashboard, and also important to ensure transparency. Therefore, regardless of the final architecture, the group believes that open data standards should be employed. Nonetheless, the governance body may also choose to procure a central Pension Finder Service and/or a Dashboard User Interface, as well as enabling a marketplace in these.

Traditionally, de facto standards emerge either by virtue of market adoption or agreement amongst members of a relevant standards committee. However, as the Pensions Dashboard will create an entirely new service, the governance body will be required to establish and maintain a practical set of industry-wide open data standards.

Developing a standard which is practical to implement across the hundreds of pension providers and trustees with tens of thousands of schemes will require careful consideration and wider industry consultation, but, as other industry initiatives have demonstrated, this is feasible and it should be achievable within the HM Treasury's 2019 deadline (HMT, 2016).

## **Registration and accreditation**

An important governance function is the registration and accreditation of all the service providers and data providers involved in the Pensions Dashboard.

As the Pensions Dashboard will use open standards and potentially develop an Open API, at first glance individuals may believe there is no need for a formal accreditation process, since users could be the ultimate arbiters of the accuracy and quality of their data.

However, while embracing an open approach, this must be balanced against the need to protect consumers from those individuals or organisations with malicious intent. The Pension Finder Service must be able to recognise which dashboards are legitimate, and which providers to interrogate. There is a risk of detriment from data errors or misuse by a data provider or by a dashboard. Therefore, there is a need for a due diligence and accreditation process.

The responsibility for undertaking the accreditation procedure could be undertaken by the Pensions Dashboard governance body, or another organisation with sufficient scale and clear regulatory powers, such as an existing regulator. For example, if any new regulated activity is introduced for offering a dashboard, the Financial Conduct Authority (FCA) would need to undertake the authorisation of these services.

The steps involved in an accreditation process should encompass a range of checks to test whether services meet the data standards and any new regulatory standards, alongside an evaluation of whether the services are in the best interests of consumers. These tests will apply to data providers, the Pension Finder Service, the Dashboard User Interface and any ancillary services or third party software supplier looking to use data from the Pensions Dashboard.



## Supervision

Once a service is accredited, we believe there will be a need for ongoing monitoring of service providers to ensure they continue to meet the standards expected.

Security and accountability are particularly pertinent issues when discussing sensitive consumer data. The governance body will be required to establish procedures to monitor accredited services – although these procedures could be assigned to other organisations – to ensure the services meet existing domestic data protection legislation and the incoming European Union General Data Protection Regulations (EC, 2016).

The governance body would also need to establish arrangements between all dashboard services, such as service level agreements or contracts, liability for safeguarding data, and dispute resolution procedures.

Some responsibility for supervision of services could be taken on by another organisation with sufficient scale, such as a regulator. Other regulators will monitor some participants as a matter of course in their existing role, in particular: the Information Commissioner's Office (ICO), the FCA and The Pensions Regulator (TPR) (see Section 8). It would be desirable for the governance body to agree a division of responsibilities or sign a Memorandum of Understanding with the FCA and TPR to avoid gaps and overlaps in responsibility.

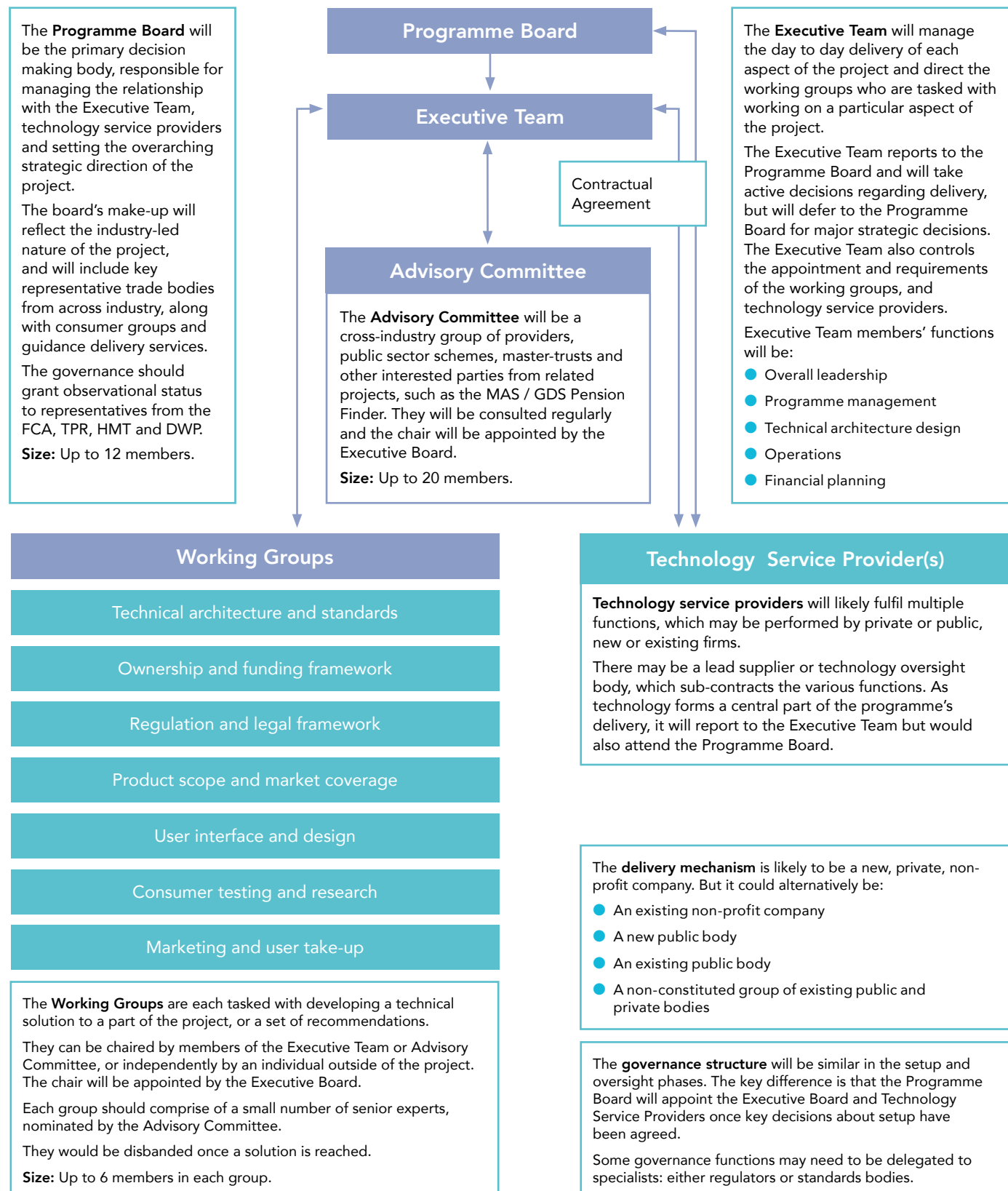
Should a particular service or provider no longer meet the agreed standards or their regulatory requirements, then the governance body should immediately revoke their access to the Pensions Dashboard network. If a legal or regulatory breach occurs, or if an individual or organisation fraudulently claims to be a Dashboard User Interface provider, a Pension Finder Service or a data provider, the governance body would report the action to the relevant authorities. The project group has not discussed what further action might be taken, or what enforcement functions the governance body itself might have.

Each of these roles requires further consideration and development to establish their specific functions, but the project team believes they are not beyond the scope or capability of an accountable and representative industry-led governance body.

## What could the governance model look like?

When looking at the operation of a potential governance model for the Pensions Dashboard, the project team have taken other large scale cross-industry projects into account including the ABI's Flood Re, the Employers' Liability Tracing Office (ELTO) and the Open Banking Working Group. From discussions within the project group, it is proposed that the model of governance shown in Figure 7.2 should be explored.

**Figure 7.2 Pensions Dashboard: proposed governance structure**



Further work is required to establish the specific membership of each board, team and group identified in Figure 7.2, although it is recognised that there are already a number of pre-existing industry groups, with expertise that should be harnessed in the subsequent development phase of the Pensions Dashboard.

However, as the Pensions Dashboard is an industry-led project supported by Government, this should be reflected in the make-up of the governance structure by providing a majority of positions on the Programme Board to representative industry bodies, and granting observer status to interested government departments and regulators.

## What type of organisation should be responsible for delivering the dashboard?

The Figure 7.2 above is agnostic as to the type of organisation, or organisations, that should act as the 'Executive team', the body that would make recommendations to and take direction from the decision-making 'Programme Board', as well as making day-to-day decisions on delivery.

There are several models for this, and each can build on the experiences of those in the project group:

- Private company (limited by guarantee)
- Community Interest Company
- Public body
- Re-use an existing body or organisation.

There are a number of examples of industry-led and funded projects in general insurance established by the ABI, involving a private company limited by guarantee. This type of corporation is typically used for non-profit organisations that require a legal personality (allowing it to benefit from a limited liability, enter into contracts in its own name etc.). The Motor Insurers' Bureau and Medco are both companies limited by guarantee. Medco, an organisation set up to facilitate the sourcing of medical reports in soft tissue injury claims, has a similar governance structure to the diagram proposed earlier. In savings and investments, TISA Exchange or TeX for re-registration of assets was also set up in this way.

Alternatively, the Community Interest Company (CIC) is a relatively new form of organisation, with limited liability but making clear that the intention of an enterprise is to provide community benefit, for example. The Consumer Codes Approval Board operated by the Chartered Trading Standards Institute is a CIC.

The organisation could potentially be a new public body, and the distinctions between public and private may not be obvious. For example, the Personal Accounts Delivery Authority was established in legislation to deliver personal accounts, which led to automatic enrolment; NEST took over from PADA and is a non-departmental public body, and a workplace pension scheme run as a trust by NEST Corporation. Flood Re, a reinsurance company established to provide affordable and available home insurance for homeowners flood-prone areas, was classified a public body by the Office of National Statistics. This was due in part to the way Flood Re is funded (primarily by way of levies imposed by legislation on UK home insurers). There is a chance that if the Pensions Dashboard project was funded by way of a compulsory industry-wide levy set by government, then the income may be deemed public funds and/or the company classified as a public body. This could mean direct accountability to Parliament, a requirement to comply with OJEU procurement rules and other more stringent governance and process. Further analysis is required to determine whether a government-imposed levy may lead to the company being classified as a public body.

An existing organisation could also be responsible for delivery of the Pensions Dashboard. For example, the Origo Options transfer service was set up by industry using an existing organisation to enable pension transfers and has gradually expanded. In the public sector, Pension Wise was set up through legislation which designated existing organisations, specifically the Pensions Advisory Service and Citizens Advice, to deliver it, as well as a new team within HM Treasury.<sup>9</sup> Similarly, after a need for a retirement adviser directory was identified, the Money Advice Service created one in-house in consultation with a challenge panel of stakeholders.

In each case, the choice will depend on the circumstances and the views of stakeholders, but the key factors appear to be:

- The purpose of the project
- Whether it can be delivered by the market
- Whether there is an obvious existing organisation willing and able to do it
- Governance and funding requirements

This project could be delivered by the market and is seen as industry-led, but there are arguments for it to be publicly accountable; there are many organisations that could potentially oversee it, but a collaborative approach is required; and as set out above, the governance requirements are extensive. It will be for the governance body or 'Programme Board' to decide how the body it establishes should be constituted, taking these factors into account.

## Funding

In the Budget 2016, HM Treasury (2016) announced that there would not be any public money available for the project with the costs expected to be covered by the industry. Given the wider industry support expressed among project participants, this is not believed to be an insurmountable challenge provided the funding structure employed is proportionate and commensurate with other industry initiatives.

It is acknowledged that if this is an industry-led project, then a commercially viable and self-sufficient funding model will need to be employed. An industry utility or a public body may deliver some components of the dashboard, and would require funding, though this will not be 'commercial'. The governance body will also need to decide whether it will procure services itself, or facilitate a market in those services.

Nonetheless, funding arrangements should be underpinned by the commercial principles agreed by the project group shown in Box 7.1:

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<sup>9</sup> Responsibility for policy has been moved to DWP since 1 April 2016

### Box 7.1 Commercial Principles

1. Consumers are entitled, and will increasingly expect, to be able to access statement data about their long term savings accounts through digital channels. This will be a cost of business for pension providers and, in the medium term, may be a saving on the way they currently provide this information. Therefore, there should be no cost to consumers in accessing this information digitally, whether directly with a pension provider or through a pensions dashboard.
2. Some third parties wishing to present Pensions Dashboards to consumers will do so for commercial reasons. This may result from selling new products or services to consumers who access their pensions dashboard, or from other means. To create new value propositions they will need to have the consent of consumers and the data controllers to access data held by pension providers. These third parties should therefore contribute to the cost of governance required to facilitate this data flow under a reasonable, cross industry and agreed commercial model.
3. No intermediary should retain customer data or aim to create commercial value from that data without (a) the customer's consent and (b) the agreement of the data controller.
4. Intermediaries will create commercial propositions for their customers.
5. Commercial models should not prevent new propositions being developed by innovative market entrants.
6. A market for trustworthy digital identity will be established on a commercial basis. The rules of this commercial market will apply to Pension Dashboards providers.
7. Certain organisations seeking to participate in the Pension Dashboard service will be required to pay for governance. This need to be determined by the governance body.

### Funding models

The project group have briefly discussed and outlined several potential funding models:

- **Commercial self-funding model:** The core architecture and/or the Dashboard User Interface development costs could be covered by organisations who sign up and provide the initial seed capital, which could then be recouped by charging providers for data processing and access to the service. Preliminary discussions amongst the project group suggested that access and data processing fees must remain proportionate with the expected cost, and should not preclude the participation of new entrants to the market. It is conceivable that providers could be incentivised to self-fund by benefiting from a proportionate reduction in other levies.
- **Levy:** An industry-wide levy set by either the government, regulators or the governance body should be explored as a potential funding model. This could require existing industry levies such as those used to fund the FCA or The Pensions Regulator (TPR), to be expanded to cover the Pensions Dashboard. Although, any levy must be kept commensurate with the material costs and proportionate to the size of pension provider.
- **Membership model:** Participation could require an initial joining fee to recoup the seed capital, followed with an ongoing subscription cost to cover maintenance. The level of both charges would have to be set at a level which does not prohibit access by new or smaller pension providers, otherwise the model could be considered to be anti-competitive under UK competition regulations.

Further thought and analysis is required to understand the scale of costs, and the scope for developing a self-sufficient funding model. It will be important that the costs are spread fairly among industry participants. A key part of the debate is whether the funding should be demand-led (by those who want data) or supply-led (by those who provide data). Those who stand to benefit most from the dashboard and are in a position to develop their own services may wish to supply the initial funding, but this may cause concerns over undue influence. On the other hand, it may be seen as unfair and inefficient to require those firms and schemes that may not stand to gain materially from the dashboard to pay for its development, as well as submitting their data.

In developing the funding model, the governance body will also have to be mindful of competition concerns, by ensuring that the level of fees or charges is not sufficiently onerous to exclude smaller businesses – especially smaller fintech start-ups – from participating. Lastly, funding is closely linked to the strategic decisions on the governance and the regulatory framework: if it is decided that all data providers should pay, this may need to be levied, and the levy may need to be enabled via legislation and collected by a public body.

## Costs

As with the creation of any new service, there is a requirement for initial capital to cover start-up costs. Funding is also required for running and maintenance of the overall service. Digital services are not static. They require constant support as they iterate and evolve in response to changing consumer needs and technological developments.

There would be a range of costs that the industry would incur in delivering a Dashboard, and multiple funding streams for the multiple components. These could be paid for directly through firms' own commercial arrangements, voluntarily through a subscription model, or by an industry-wide levy. It is likely that the main cost for many providers and schemes will be improving their data and enabling it to be submitted to a Pension Dashboard. On an ongoing basis, the most costly is likely to be that of the governance and delivery body.

The costs include

- Providing data
- Pension finder service(s)
- Cost of governance and delivery body
- Development of dashboard user interface(s)
- Maintenance of dashboard user interface(s)
- Identity verification system

It is likely that the main cost for many providers and schemes will be improving their data and enabling it to be submitted to a Pension Dashboard. On an ongoing basis, the most costly aspect is likely to be that of the governance and delivery body.

## 8. Legislation, Regulation and Legal Issues

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While industry has been tasked with designing, funding and launching the Pensions Dashboard (HMT, 2016), the project may nevertheless require support from legislation and regulation.

### Legislation

During the Alpha Phase, the project team has engaged with industry to sound out views on a wide range of issues, including governance. There was a clear preference from some organisations for legislation, in particular, to make clear that submitting data to the Pensions Dashboard was a priority among other expectations and obligations, and to ensure that the whole industry does eventually follow suit.

There was also a strong view from stakeholders that any legislation should only be introduced at the right time and with the right balance of detail. It should not pre-empt design decisions on the Dashboard, and it should not be so prescriptive as to limit innovation. It was generally viewed that if legislation is needed, it should only require providers and schemes to submit data – it should not prescribe what the data standards would be, or how data are transmitted.

It may be that a regulation-making power is sufficient to ensure that action is taken and data is submitted (without statutory regulations actually being made). There are some relevant examples from other industries. For example: the Payment Service Directive 2 specifies that *'Member States shall ensure that a payment service user has the right to make use of services enabling access to account information'* (EU, 2015, Article 67). Ahead of the Directive being transposed into UK law, the Open Banking Working Group (ODI, 2016) developed a report for an Open Banking Standard to fulfil this need.

Similarly, the 'midata' powers contained in the Enterprise and Regulatory Reform Act 2013 have been used to prompt action in energy and banking, but without regulations being made. The power enables the Secretary of State so that he or she *'may by regulations require a regulated person to provide customer data...to a customer, at the customer's request'* (ERRA, 2013, section 89). The same section could be used for the part of the pensions industry that could be described as 'regulated persons' who have customers. Trust-based occupational schemes and their members may fall into this category but the exact legal position is still to be developed.

There are parallels of regulation-making powers in pensions too. The industry code on incentivised transfer exercises (CPIE, 2016) had widespread support at its introduction in 2012. However, the Government was concerned that a voluntary code might not work, and gave itself a regulation-making power to ban such exercises in the Pensions Act 2014 (section 34), with a seven-year sunset clause meaning it will expire if not used.



## Regulatory framework

This section sets out the questions and considerations for regulators in development of the Pensions Dashboard. The potential role of regulators in oversight of the Dashboard is closely linked to the governance questions discussed above, and their roles and interests will partly be determined by the model that is chosen.

Regulators will undertake some supervision of participants in the Pensions Dashboard as part of their existing duties. The ICO, TPR and FCA have duties and enforcement powers around use of data, communication with customers and acting in the best interests of customers and scheme members, and are likely to have decisions to make on the content contained within the Dashboard and the data that flows within the system:

If legislation requires firms and schemes to submit data, the FCA and TPR may need to monitor schemes to ensure that they are submitting data. They would also take action in the event of errors. The existence of the Dashboard and any requirement to submit information to it may expose other regulatory concerns, if there are cases of poor or non-compliant management of data.

For the white-labelled and federated models, where a Dashboard User Interface appears on a firm's website, existing FCA rules would apply to the surrounding content. This may apply whether the firm is regulated or not, if the content constitutes a financial promotion or investment advice (FCA, no date).

For all models, the project group and stakeholders agreed that it is desirable for the data to be dependable for use by others. The Financial Advice Market Review (HMT and FCA, 2016) recommended that “the FCA consult on guidance to provide clarity on the standard types of information required as part of financial advisers’ fact-find process. In addition, the guidance should also set out key considerations for verifying a fact find that has been performed by third parties. Efficiencies in the fact-finding process can be created if regulated firms, including advisers and providers, can re-use data from a Pensions Dashboard with appropriate consent. Guidance bodies should also be able to re-use it, although, given that they are not regulated, they may be concerned about the regulatory boundary. However, Pension Wise standards are monitored by the FCA and guidance organisations may seek reassurance from the FCA that this is possible.

The regulators might also take on new roles:

- Regulators could potentially undertake the role of accrediting participants. The Pensions Regulator and HMRC already register and set requirements for pension schemes, and the FCA authorises the firms it regulates. All have certain standards of competence and/or fitness and propriety that the trustee, administrator or firm must meet.
- For the federated model, HM Treasury could legislate for a new regulated activity of offering a Pension Dashboard User Interface, meaning that Dashboard User Interface providers would need to be registered and potentially authorised by the FCA. This would help to give legitimacy to Dashboard User Interface providers and encourage trust between participants. This would also create a new perimeter, with powers granted over unauthorised Dashboard User Interface providers.
- If regulation is not introduced, the FCA could decide to set out providers’ obligations in relation to those Dashboards – for example, what due diligence would be required by a provider before submitting data.

## Data protection and privacy

Data is at the centre of the Pensions Dashboard, and data security is paramount. Putting customers in control of their own data can empower people to understand their own position and make informed decisions, but it comes with risks. Concerns were raised throughout the project about the ability of a pension provider or scheme to submit data, or for a Dashboard User Interface to display information, in a way that is compliant with data protection law.

More specifically, the following issues need to be addressed:

- What 'consent' means, and what users and data controllers are consenting to
- The need for trustees to give consent for members to access data
- The risks of a security breach
- The risk of firms mining data, and what they might do with that data
- What amount of data storage is acceptable
- Whether a false match is ever acceptable
- What constraints there are on use of the data by third parties.

The project team discussed these issues with the Government Digital Service's Privacy and Consumer Advisory Group (PCAG), which includes, among others, the Information Commissioner's Office. The main implication for this project are that: design choices can increase or decrease the risks above; and these choices, say, around persistence of data and fuzzy matching, often involve a trade-off between usability and privacy risks. The choices need to be justified and alternatives considered. They give added importance to the role of the governance body in accrediting and supervising participants. Further work is required to pinpoint in the data-flow diagrams (Figures 6.1 and 6.2 in Section 6 above) who is a data controller and a data processor, for which data, and at what point they become one.

## International dashboard examples

International examples are also highly relevant – dashboards have been developed in the Netherlands, Sweden and Australia (these findings are drawn from an event by Royal London in May 2016). Common features include joint work between public and private sectors, and a gradual approach to implementation – for example, the Netherlands had full coverage from day one due to legislation, while Sweden has gradually risen to 99% coverage and Australia has exemptions for legacy schemes. The nations also had differences in the lead organisation and where the dashboard appears: the Netherlands has a single site; Sweden has a single dashboard, now accessible from multiple sites; Australia has a government dashboard but which other organisations can adapt within their sites. The Netherlands and Australia legislated, and Sweden recognised that legislation would have delivered their dashboard earlier.

## 9. Recommendations

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Consumer expectations are changing, with more people accessing financial information and services online. The take-up of online banking and bill-paying might indicate ability and willingness also to engage with pensions online. The Pensions Dashboard is the vehicle to facilitate a degree of behaviour change in pensions engagement. As with any new service which needs to be embedded into the consumer consciousness, it will take time for consumers to understand the nature of this resource and adopt it into their retirement planning.

### Dashboard model

Consumer research has suggested that consumers value the option of a single destination dashboard above the others for reasons of trust, assurance with their data and simplicity in a complex subject area. Building a single destination dashboard also offers the benefits of a more controlled environment in which to develop and test a high profile product containing sensitive data; allowing risks to be managed and reputational damage (particularly in terms of data protection issues) to be avoided.

At the same time, the benefits of making the Pensions Dashboard available through other financial organisations where consumers are already engaging in financial matters cannot be ignored, especially as this could have greater reach when trying to engage the population in their retirement planning.

With this in mind, the recommended approach is to initially build a single destination dashboard that is, nevertheless, capable of, and technically ready to, be white-labelled through approved industry websites (such as pension providers), once the complete Pensions Dashboard service has been fully tested from a security and quality assurance perspective.

In terms of the Pension Finder Service, the practicalities of starting with a single Pension Finder Service outweigh the potential innovation benefits of multiple Pension Finder Services. However, the architecture will be future-proofed to enable evolution to support other models, including multiple dashboards, should demand arise.

The architecture design will also allow for multiple Integration Service Providers to work with pension providers who do not have the resources or motivation to develop their own integration technology.

### Phased implementation

The delivery of a pensions dashboard service is a large undertaking. The discussion about Pensions Dashboard implementation coalesced around delivering the Dashboard in small incremental parts or delivering a fully comprehensive dashboard from initial launch. As the project progressed, a consensus has emerged that incremental delivery to 2019 is the most sensible approach, and there is some momentum to deliver ahead of 2019 if possible.

It is agreed that a phased implementation approach is necessary for delivery. The exact phasing structure has not been established.

Phasing could be on the basis of:

- Types of scheme, such as defined contribution initially
- Types of data, such as the existence of a pension
- Types of customer, such as those born after a certain date
- Architecture, from a single destination to syndicated to federated

The initial phase will aim to include the State Pension, and should also include some public-sector schemes and automatic enrolment defined contribution providers.

One of the key challenges with phased implementation is the management of consumer expectations as different data and pensions are introduced onto the Dashboard.

## Governance and legislation

A representative and accountable governance structure is required for successful delivery and running of a Pensions Dashboard Service. The governance structure could initially be established with a coalition of industry representatives and input from consumer bodies. Further work is required to establish whether they would deliver the Dashboard through an existing organisation, or through the creation of a new public or private body.

Initially, the governance should focus on setting strategy, initiating and managing project delivery and setting operating standards, but over time, this role will change into an overarching oversight responsibility as the Pensions Dashboard service is gradually rolled out across the industry.

As the Pensions Dashboard is an industry-led project supported by Government, this should be reflected in the make-up of the governance structure by providing a majority of positions on the Programme Board to representative industry bodies, some positions for consumer bodies and granting observer status to interested government departments and regulators. In practice, we expect Government and regulators to provide a steer where appropriate – as they reserve legislative and regulatory powers if the Dashboard does not progress, or progresses in a way they did not want.

The area of funding is complex and requires more work to establish a suitable model. The funding arrangements should comply with the commercial principles set out in Box 7.1.

## Next steps

The next steps for the project are moving into a second phase of Alpha to build an end-to-end prototype of a Pensions Dashboard service and to develop the cross-organisational governance structure. The intention is to maintain and build momentum, delivering a first alpha service which is iterated and improved through a private and then public beta in 2017 before becoming a 'live' service. The timeline is shown in Figure 9.1.

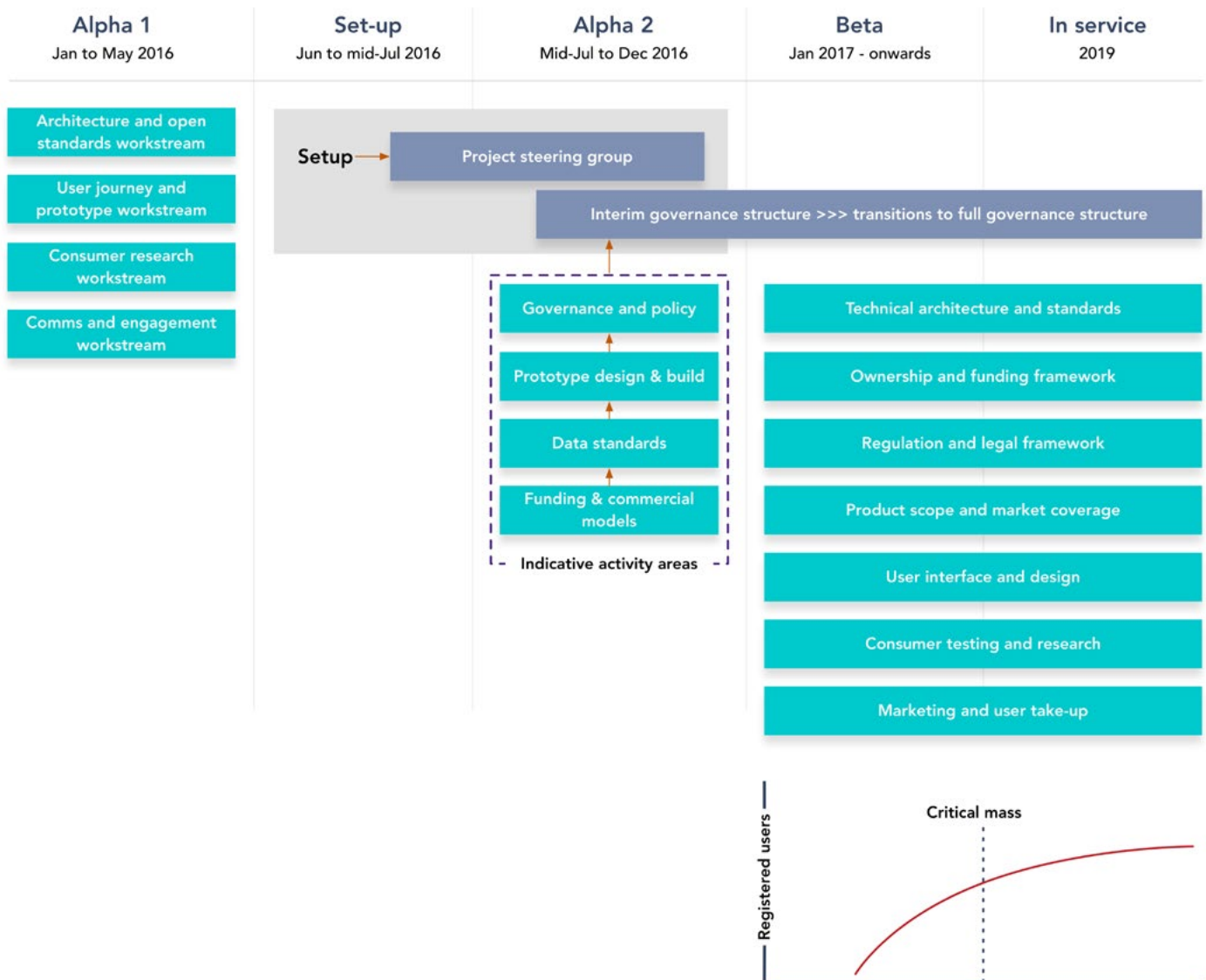
The second phase of Alpha will be open to all organisations who wish to participate. It is the desire to have full representation from all parts of the pensions industry to ensure all views are represented and considered in any further Pensions Dashboard development.

Project participants will be those participating organisations from the previous phase able to commit to the delivery timetable and willing to invest money or provide resources to do so, together with any new organisations who wish to participate on the same terms.

The period from June to mid-July will be establishing the second phase project governance structure and funding. The project governance structure and resourcing will be agreed prior to the commencement of Alpha 2.

Figure 9.1 outlines indicative activity areas for the next phase. This will need to be fully agreed and resourced appropriately during the set up phase. For example, the end-to-end prototype may include the full development of partial matching journey in addition to building on the financial sector best practice in identity verification.

Figure 9.1 Pensions Dashboard timeline



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## Appendix I

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### Glossary

#### **Access token**

An access token contains the security credentials for a login session and identifies the user, the user's groups, the user's privileges and, in some cases, a particular application.

#### **Accumulation Phase**

This covers active or paid-up pensions that have not been annuitised or where drawdown has commenced.

#### **Application Programming Interface (API)**

It is a means of accessing data based on a standard. The data accessed via an API may be closed, shared or open data.

#### **Consumer**

A person with a form of UK pension entitlement who will make use of a Pensions Dashboard.

#### **Dashboard Provider**

The provider of a Dashboard user interface that will use the data generated from the Pensions Finder Service.

#### **Dashboard User Interface (UI)**

The user interface which enables an individual to view their information.

#### **Data Provider**

The provider of data. In the context of the Pensions Dashboard Service this will be the pension companies and trustees who supply data to the service and also the DWP for the State Pension.

#### **Decumulation Phase**

Refers to the stage when a consumer has started to draw income from their pensions.

#### **Defined Benefit Pension**

Pays a retirement income based on your salary and how long you have worked for your employer. Defined benefits pensions include 'final salary' and 'career average' pension schemes. Generally only available from public sector or older workplace pension schemes.

#### **Defined Contribution Pension**

Builds up a pension pot to pay you a retirement income based on contributions from you and/or your employer. Your pot is put into various types of investments, including shares (shares are a stake in a company). The amount in your pension pot at retirement is based on how much has been paid in and how well the investment have performed. Also known as 'money purchase' schemes. Includes workplace and personal pensions, including stakeholder pensions. Might have be run through an insurance company or master trust provider, or through a bespoke scheme set up by your employer.

#### **Delegated Authority**

A Consumer may be able to delegate authority to an adviser or other Third Party to access their Pensions Dashboard. Authorisation to act on behalf of another.

#### **Digital Identity (ID)**

This is the identification technology that will enable users to access their information. The government is working with industry on a private sector digital identity assurance hub.

## **GOV.UK Verify**

A new identity and verification mechanism from Government Digital Services that allows a consumer to prove their online identity for government services.

## **Governance Register**

The new governance model will require a Governance Register of all approved participants. (e.g. pension dashboard providers, pension dashboard UI providers)

## **Identity and Verification (ID&V)**

These checks will be performed on a consumer before access would be granted to their Pensions Dashboard.

## **Identity Assurance**

The ability for a party to determine, with some level of certainty, that an electronic credential representing an entity (human or a machine) with which it interacts to effect a transaction, can be trusted to actually belong to the entity. Proving you are who you say you are to a certain level of confidence.

## **Identity Provider (IDP)**

Private sector organisations paid by the government to verify a user is who they say they are and assert verified data that identifies them to the relying party. The organisations are certified as meeting relevant industry security standards and identity assurance standards published by the Cabinet Office and CESG (the UK's national technical authority).

## **Integration Service Provider(s) (ISP)**

Technology enablers who can provide modern real-time access to data on or from the underlying Pension Provider administration systems.

## **Messaging Hub**

A service that supports the secure transmission of messages based on Open Data Standards.

## **Open API**

A public interface that provides a means of accessing data based on an open standard. The data accessed via an open API may be closed, shared or open data.

## **Open API Standard**

An open standard is developed and maintained collaboratively and transparently, and can be accessed and used by anyone.

## **Open Data**

Data that anyone can access, use and share. For data to be considered "open", it must be: accessible, which usually means published on the Web; available in a machine-readable format; and have a licence that permits anyone to access, use and share it – commercially and non-commercially.

## **Open Data Standards**

Data standards to support specific business processes e.g. for Pensions Dashboards: "Match" and "Value". They are publicly available and free-of-charge, subject to rights of use.

## **Open Identity Exchange (OIX)**

A non-profit trade organisation of market leaders from competing business sectors driving the expansion of existing online services and the adoption of new online products. Business sectors include the internet (Google, PayPal), data aggregation (Equifax, Experian) and telecommunications (AT&T, Verizon).

## **Pension Finder Service (PFS)**

A core architecture component that deals with the aggregated Find (match) of pensions and orchestrating pension valuation requests for data required for a pensions dashboard.

## **Pensions Dashboard**

A Pensions dashboard encompasses three core components: Digital ID, Dashboard User Interface and the Pension Finder Service. It is these three parts working together that create a Pensions Dashboard.

## **Personal data**

Data from which a person can be identified (as per UK Data Protection Act definition).

Note: personal data can be closed, shared with specific people or organisations, or made public.

## **Persistent Identifier (PID)**

A unique identifier which refers to a combination of a user and the identity provider that verified the user's identity. Persistent identifiers are generated by identity providers. They are constructed using pseudo-random values that have no discernible correspondence with the user's actual identifier, for example, their email address.

## **Private Sector Verify Hub**

Private sector equivalent of GOV.UK Digital ID hub.

## **Relationship data**

This means any recorded information that describes (or infers) a relationship between a "Service User", "Identity Provider" or "Service Provider" with another "Service User", "Identity Provider" or "Service Provider" and includes any cookie or program whose purpose is to supply a means through which relationship data are collected.

## **Service Provider**

A supplier of Messaging Hub, Index or other service components.

## **Shared data**

Data that is shared specifically with named individuals and organisations, specifically with groups that satisfy certain criteria, or anyone else, but under terms and conditions that are not open. Named access, group-based access, and public access are three types of shared data

## **State Pension**

A regular payment from government that you qualify for when you reach State Pension age. The State Pension age for men and women is increasing and will reach 66 by 2020. It's due to rise further to 67 by 2028. The amount you get depends on your National Insurance record.

## **Third Party**

An individual or organisation that acts on behalf of the Consumer. This is expected to be a financial adviser although the Pensions Dashboard Service could provide access to other Third Parties e.g. a family member where a Power of Attorney has been granted.

## **User**

A user of (and/or account holder of) commercial products or services offered through digital channels. For the purposes of this report these will primarily relate to financial services propositions.

## Appendix II

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### Consumer research methodology

The research consisted of 24 one-to-one depth interviews, spread across London, Birmingham, Cardiff and Edinburgh. Respondents were split evenly across two segments of the Money Advice Service segmentation model (Squeezed and Cushioned) – See Box II.1. To reflect attitudes of people at different stages in their working life, one third of respondents were aged 55-65 and two thirds aged 30-54.

This range of cohorts enabled us to draw insights from the broad target audience that we would expect to use the Pensions Dashboard and reflected the varying degrees of knowledge and engagement in retirement planning that might be expected from people of different age ranges and backgrounds.

As with the Discovery Phase testing, a clickable prototype of a Pensions Dashboard was created as the reference material during the interviews. The prototype did not connect to any data, systems, software or websites; but was hard-coded with the data of six persona types, allowing us to match respondents with data that reflected their profile (see Box II.2). Entering the name of the persona at the start of the journey triggered the prototype to use that persona's data for the remainder of the journey, helping to make the testing feel more life-like.

To explore individual reactions to the different dashboard options, the prototype was developed with three different ways to progress through the customer journey:

- **Through a money guidance website** (for the purposes of testing the Money Advice Service branding was used). This reflects Option 1 - the 'single destination' model - a single version of the dashboard accessed through one website only, in this case a not-for-profit money guidance body website.
- **Through a pension provider website** (for the purposes of testing the Aviva branding was used). This reflects Option Two - the 'white labelled' model – where the same dashboard with consistent layout and information would be available through multiple organisations.
- **Through a bank website** (for the purposes of testing Barclays branding was used). This also reflects Option Two, but explored the premise that people would be more likely to check their Pensions Dashboard whilst they are using their internet banking.

Each interview began with questions and discussion to gauge the respondent's views on retirement saving and their knowledge of the different types of pensions (defined contribution, defined benefit and State Pension).

The respondents were then introduced to the concept of a Pensions Dashboard and asked whether they would value this as a useful resource, before being shown the prototype.

The choice of journey for each respondent was determined by their initial discussion with the moderator and some guidance to ensure each version of the journey received fair coverage amongst respondents. The moderator also discussed the third option – the 'federated' model – of a customisable dashboard to enable different organisations to create differentiated Pensions Dashboard services.

Following the approach of the Discovery Phase prototype, respondents were assumed to have a Digital ID and to have logged in via the Post Office identity verification page (the Post Office being one of the Verify registered Digital ID providers).

With Digital ID being a separate service utilised by, but not created for, the Pensions Dashboard, the testing did not dwell on this stage of the journey and the respondents proceeded to validate their login details and enter their National Insurance number as an additional point of reference to help facilitate the search for their pensions.

It is at this point that we tested the idea of people giving consent for their information to be used to search through pensions providers (including the State Pension), enabling their pensions information to be displayed on their dashboard.

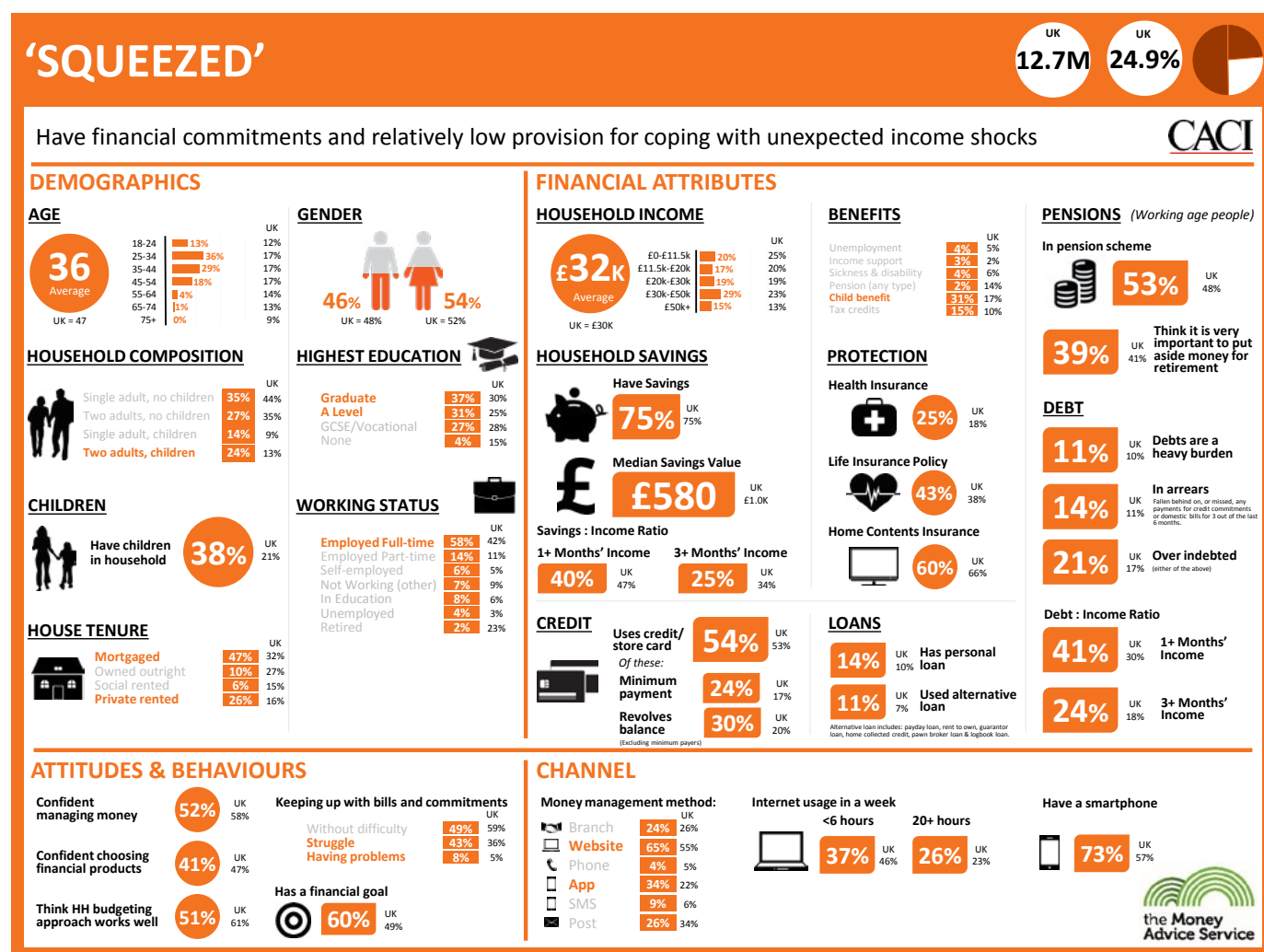
After consent was provided, the respondents were shown the main dashboard page, where they could see an overview of their State Pension and any defined benefit and defined contribution pensions, click through to individual pension pages for more detail and navigate to sub-journeys like pension matching or tracing a pension.

The data displayed on the main dashboard page and the individual pension pages all contained persona-relevant data.

Respondents could also get a pension forecast and consent to share their pensions data with third parties.

At the end of the concept and journey testing, consumers were asked what actions, if any, they might take after using a Pensions Dashboard.

## Box II.1 Segments from the Money Advice Service segmentation model



# 'CUSHIONED'

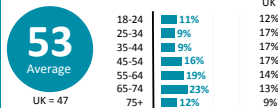


CACI

The most financially resilient group

## DEMOGRAPHICS

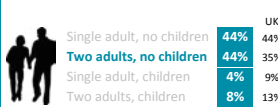
### AGE



### GENDER



### HOUSEHOLD COMPOSITION



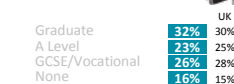
### CHILDREN



### HOUSE TENURE



### HIGHEST EDUCATION



### WORKING STATUS

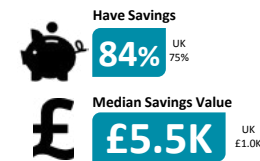


## FINANCIAL ATTRIBUTES

### HOUSEHOLD INCOME



### HOUSEHOLD SAVINGS



### Savings : Income Ratio



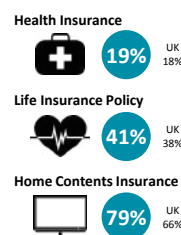
### CREDIT



### BENEFITS



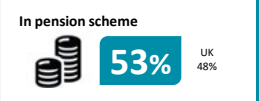
### PROTECTION



### LOANS



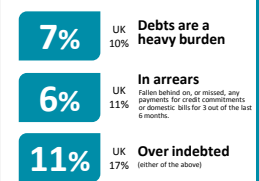
## PENSIONS (Working age people)



**46%** UK = 41%

Think it is very important to put aside money for retirement

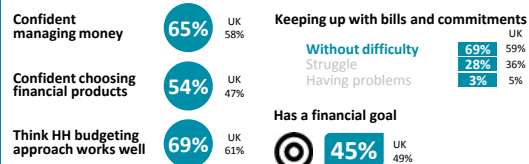
### DEBT



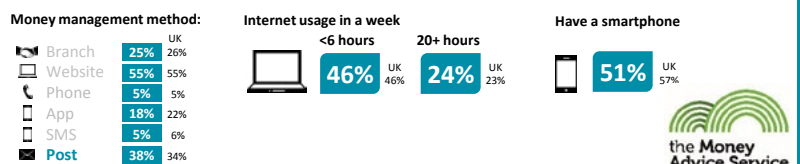
### Debt : Income Ratio



## ATTITUDES & BEHAVIOURS



## CHANNEL





## Box II.2 Personas used in consumer testing



**Frank Boyle**  
Customer segment: Squeezed

Age	64
Gender	Male

---


Salary	£20,000
Planned retirement age	65
Target retirement income	£20,000 per year

---

State Pension age	65
State Pension date	07/02/2017
Qualifying years	45

---

DB Pension	£3,250 per year
DC Pension 1 (current value)	£8,000
DC Pension 2 (current value)	£12,000
DC Pension 3 (current value)	£5,000



**Marjorie de Sousa**  
Customer segment: Squeezed

Age	53
Gender	Female

---

Salary	£25,000
Planned retirement age	65
Target retirement income	£17,000 per year

---

State Pension age	67
State Pension date	13/04/2030
Qualifying years	20

---

DC Pension 1 (current value)	£8,000
DC Pension 2 (current value)	£4,000



**Sarah Paulson**  
Customer segment: Squeezed

Age	37
Gender	Female

---


Salary	£18,000
Planned retirement age	65
Target retirement income	£13,000 per year

---

State Pension age	68
State Pension date	16/07/2046
Qualifying years	10

---

DC Pension 1 (current value)	£4,000
------------------------------	--------



**Palash Sen**  
Customer segment: Cushioned

Age	63
Gender	Male

---

Salary	£45,000
Planned retirement age	65
Target retirement income	£27,000 per year

---

State Pension age	65
State Pension date	03/02/2018
Qualifying years	45

---

DB Pension	£18,000 per year
DC Pension 1 (current value)	£6,000



**Sally Jones**  
Customer segment: Cushioned

Age	49
Gender	Female

---

Salary	£60,000
Planned retirement age	60
Target retirement income	£30,000 per year

---

State Pension age	67
State Pension date	11/10/2033
Qualifying years	20

---

DB Pension	£6,000 per year
DC Pension 1 (current value)	£40,000
DC Pension 2 (current value)	£110,000
DC Pension 3 (current value)	£100,000



**Daniel Bedingfield**  
Customer segment: Cushioned

Age	33
Gender	Male

---

Salary	£55,000
Planned retirement age	65
Target retirement income	£28,000 per year

---

State Pension age	68
State Pension date	17/05/2050
Qualifying years	10

---

DC Pension 1 (current value)	£12,000
DC Pension 2 (current value)	£4,000
DC Pension 3 (current value)	£3,000

## Appendix III

### Valuation data

Table III.1 outlines the data that would form the basis of new data standards for valuations of users' State Pensions, defined benefit pensions and defined contribution pension pots.

Further work will be required for more complex types of pension, such as Self-Invested personal Pensions (SIPPs) that have multiple asset classes, and these are likely to be phased in at a later stage of the project.

**Table III.1 Data that will form the basis of new data standards**

State Pension valuation data	Defined benefit pension valuation data	Defined contribution pension valuation data
<ul style="list-style-type: none"> <li>• State Pension</li> <li>• Retirement Age</li> <li>• State Pension Date</li> <li>• Forecast State Pension Income</li> <li>• State Pension Income based on current NI contributions</li> <li>• NI contribution record</li> </ul>	<ul style="list-style-type: none"> <li>• Projected DB Income</li> <li>• Valuation Date</li> <li>• Scheme Type</li> <li>• Provider Name</li> <li>• Scheme Name</li> <li>• Employer Name</li> <li>• Membership Date</li> <li>• Selected Retirement Date or date benefits payable from</li> <li>• Reference Number</li> <li>• Additional Details</li> <li>• Additional Voluntary Contributions</li> <li>• Lump Sum Retiring Grant</li> <li>• Contingent Spouse's Pension</li> <li>• Pension Increase (%)</li> <li>• Death Benefits</li> <li>• Date of Birth</li> <li>• National Insurance Number</li> <li>• Marital Status</li> </ul>	<ul style="list-style-type: none"> <li>• Value of pension</li> <li>• Valuation Date</li> <li>• Scheme Type</li> <li>• Provider Name</li> <li>• Scheme Name</li> <li>• Employer Name</li> <li>• Membership Date</li> <li>• Selected Retirement Date</li> <li>• Reference Number</li> <li>• Additional Details</li> <li>• Date of Birth</li> <li>• National Insurance Number</li> <li>• Marital Status</li> </ul>

## Appendix IV

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### Data persistence

Future phases of the project will need to consider the following areas in more detail to determine how data persistence will be provided:

- Architectural layer in which the cache is located
- Data protection
- Technology solutions for caching data.

### Architectural layer in which the cache is located

There are four options for the location of the cache, each bearing their own advantages and disadvantages:

1. Cache at the Dashboard User Interface (UI) provider layer.
2. Cache at the Pension Finder Service (PFS) provider layer.
3. Cache at the Integration Service Provider (ISP) layer.
4. Pension provider storing the user's Persistent Identifier (PID)

The advantages and disadvantages of caching at each layer of the architecture are outlined in Table IV.1. These are not exhaustive, but provided to help with future work in the area.

**Table IV.1 Advantages and disadvantages of cache options**

Option	Technical Description	Advantages	Disadvantage
<b>1. Cache dataset at the Dashboard UI Provider layer</b>	A Dashboard UI provider could implement a cache to improve consumer experience within the service they are providing. Dashboard UI providers may also be data controllers and so already caching information, such as valuations data, which can be used in wider modelling or guidance tools within a brand's offerings to users.	<ul style="list-style-type: none"> <li>• Consumer's user experience improved during browser sessions and potentially when making repeat visits (if cache persists beyond the browser session)</li> <li>• Quickest option for utilising previous search results (although see Disadvantages)</li> <li>• Re-use of technical infrastructure. Large financial services brands which could be Dashboard UI providers likely already to have caching technology within their digital infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>• Wider industry may have concerns about cache persistence and what data is being used for</li> <li>• More complex to govern</li> <li>• Dashboard UI cache will not know when ISPs or pension providers have been added to the PFS ecosystem unless some events are sent to them to indicate all cache records should be refreshed on next consumer use of Pensions Dashboards</li> <li>• Architectural good practice and IT security policies tend to avoid caching transactional or dynamic data at the web layer</li> </ul>
<b>2. Cache dataset at the PFS</b>	A PFS could implement a cache. This would enable the return of the cached data for the consumer across all ISPs and pension providers (assuming they are all covered by the PFS)	<ul style="list-style-type: none"> <li>• Efficiency within the PFS for matching across whole of market</li> <li>• Centralised (shared services) can be developed for consent processes</li> <li>• Consumer can add policies to the cache (if required)</li> <li>• Consistency. Cache data can be re-used across service providers (Dashboard UI providers, fintech companies)</li> </ul>	<ul style="list-style-type: none"> <li>• Requires each PFS to invest in appropriated technology to enable flexible caching strategy</li> </ul>

Option	Technical Description	Advantages	Disadvantage
3. Cache dataset at the ISP	An ISP could implement a cache. This would return the cached data for the consumer that has been matched. The data would be specific to the pension providers each ISP covers	<ul style="list-style-type: none"> <li>• Efficiency within the ISP for matching</li> </ul>	<ul style="list-style-type: none"> <li>• Requires each ISP to invest in appropriated technology to enable flexible caching strategy</li> </ul>
4. Add PID from the Digital ID provider to the consumer's record at the pension provider or	The PID that is part of the initial search could be linked to the consumer record. Any subsequent matching would be faster	<ul style="list-style-type: none"> <li>• Enables pension providers to align customer records with Digital ID</li> </ul>	<ul style="list-style-type: none"> <li>• Consumers can have multiple Digital ID providers though unlikely. Pension providers need to consider this when storing PID</li> </ul>

## Data protection

There is a question on how the cached data sits in relation to 'Personal Data' or 'Relationship Data'. This is currently being determined with the Privacy and Consumer Advisory Group (PCAG) Identity Assurance Principles V3.1.

Assuming caching of data is allowed, then it is recommended that a set of principles be established to provide strong assurance that data is secure from error and misuse. Potential principles include:

- Cache is limited to 'previously found' pensions.
- No data that allows a consumer to be easily identified is held within the cache.
- Cache can be refreshed through time-lapse or user interface driven events and when new integration end-points are added (extending market coverage).
- No valuation data should be cached outside of the Dashboard UI layer.

Initial proposals on what the cache data could contain are listed below:

- Persistent Identifier (from Identity Provider)
- Local Identifier (within Cache)
- Reference Number
- Provider/Administrator Name;
- Scheme Name<sup>10</sup>
- Date of last search

User journey principles state that once a user has entered their NINO they should not have to enter it again. Therefore, consideration of how NINO is validated and then available to use for repeat Find Requests needs consideration. One option may be to always call the State Pension API first and then re-use NINO from the returned data set in the context of DB and DC Find requests to ISPs and Pension Providers.

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<sup>10</sup> Need to assess if both Provider/Administrator Name + Scheme Name is required to look up configuration data within a Pension Finder Service to determine dynamically where to send valuation requests

## Technology solutions for caching data

Different technologies exist that will enable data to be cached. The project has not explored them in detail and the suppliers used during the build phase may bring their own solutions. As an indicator there are four technology areas that could be considered and a quick assessment of their merits follows:

1. **Web Caching Technology**

Pervasive, mature, flexible and well understood.

2. **Database Technology**

Pervasive, mature and well understood.

3. **Personal Data Stores (PDS)**

Although technology has existed for some time, this market has struggled to take off and will require strong government push to promote and engage consumers. This engagement would likely require consumers to understand PDSs and the wider concept of personal attributes alongside promotion of a Pensions Dashboard. It would also require Verify IdPs to extend their capabilities into the PDS / Attribute Provider space.

4. **Blockchain Technology (distributed ledger)**

The technology that was behind Bitcoin is now viewed as a 'Programmable and Distributed Trust Infrastructure', often referred to as Blockchain 2.0. Large amounts of venture capital investment are going into innovative ways to use this technology in various business sectors e.g. Capital Markets. Use of Blockchain 2.0 is a very embryonic market. Industry commentary from Accenture suggests it will take until 2025 to reach maturity in the capital-markets ecosystem alone. It is reasonable to assume that it will take a similar amount of time, if not longer, to reach mass-market consumer adoption for personal-attribute storage-use cases. An October 2015 blog posted by Don Thibeaudeau of OIX and Keystone Law highlighted the regulatory and cross border challenges that will exist in rolling out this technology.