Scottish Government

Online Identity Assurance Programme

Technical Discovery

Preparation for Alpha Phase

Status:	**Baselined**
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Contents

1. Introduction

It is expected that the next significant stage of the OIA Programme after the Discovery stage will be an Alpha Phase.

The Alpha Phase will be undertaken to demonstrate some of the key concepts of one or more potential solutions and importantly to provide safe and flexible environments where concepts can be proven (or indeed rejected) quickly and at low cost.

The momentum of the programme will best be maintained if the Alpha Phase takes place as soon as practically it can after the completion of the Technical Discovery stage.

The Alpha Phase will create a prototype of the OIA Solution to:

- provide increased confidence that the OIA Solution is financially and technically feasible;
- demonstrate ID Providers and Relying Parties interoperating with the Middleware to form the Alpha Development System; and
- assess End-User responses to using the (prototype) OIA Solution.

Completing the Alpha Phase will:

- provide evidence to help decide if the OIA Programme should proceed "as is", cease or requires re-design or re-structuring;
- enable key strengths, weaknesses and risks of the OIA Solution as conceived to be identified and/or confirmed;
- inform cost estimates for subsequent stages of the OIA Programme; and
- inform the approach to the Beta Phase (if any) including which service elements should be the focus (including particular challenges to be explored and resolved).

This document collects our thoughts regarding how the Alpha Phase might be approached and structured. This is based on:

- our knowledge of digital identity solutions and approaches internationally;
- our awareness of the specific aims and challenges of the OIA Programme and its stakeholders; and
- our experience of conceiving, architecting and delivering complex digital solutions to the UK public sector using Agile methods.

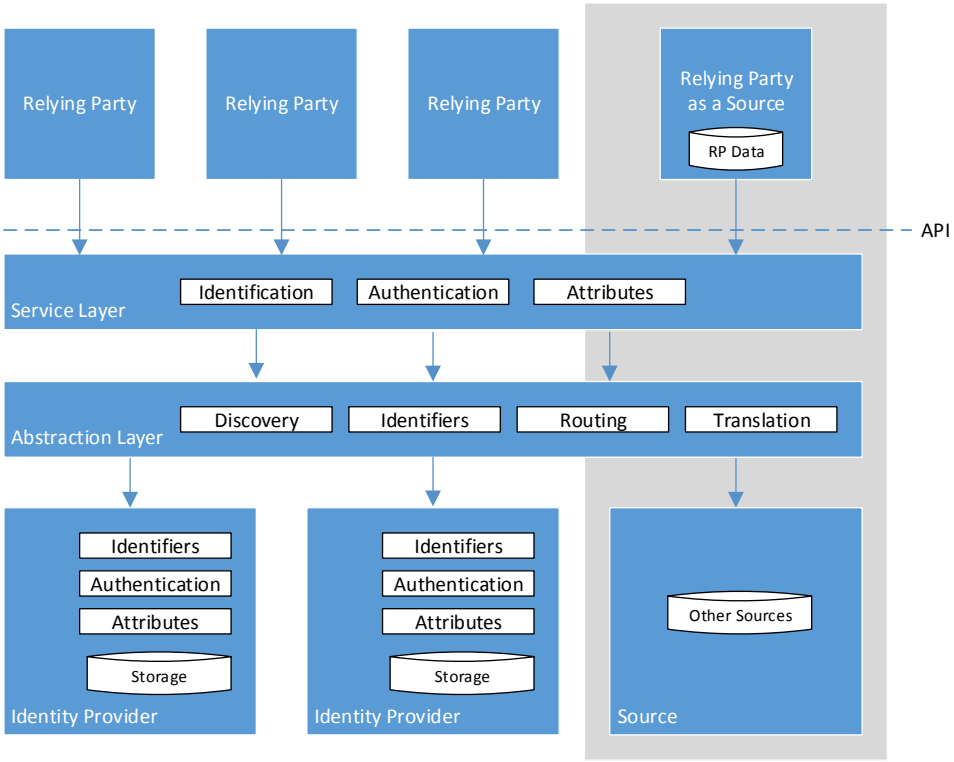
We hope that this document will provide useful input to the OIA Programme as it shapes the detailed arrangements for the Alpha Phase from the Business, Technical and Commercial perspectives.

2. Alpha Phase Elements

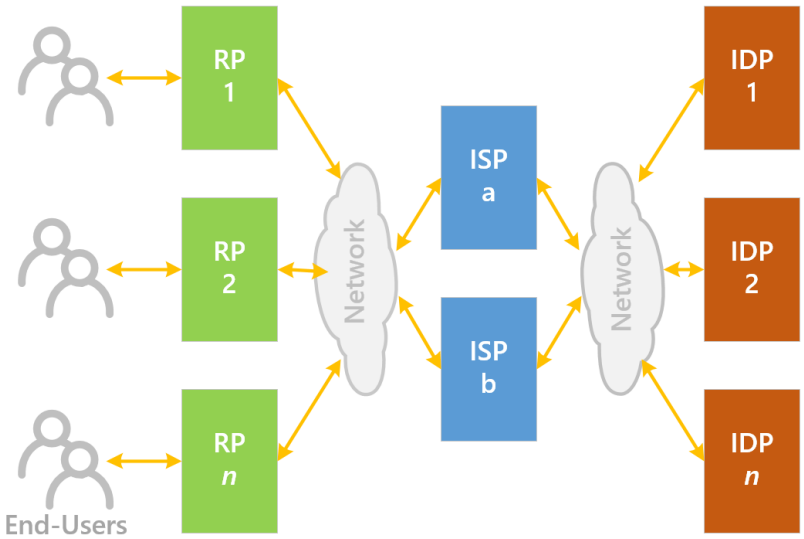
2.1. Technical Approach

What technologies and solutions should be prioritised for the Alpha Phase?

The Solution Characteristics document proposes the following architecture for the full OIA Solution.



The Alpha Phase will use a simplified version of this full solution that enables the key concepts to be proven whilst seeking to minimise complexity. In pursuit of this we suggest the following elements



should form the system for the Alpha Phase.

This schematic is a simplified (but consistent) view of the architecture for the full solution. It also shows that End-Users will be a key element of the Alpha Phase.

2.1.1. Relying Parties And End Users

Including Relying Parties with a recognised need for "real-world" online identity assurance services will be important in enabling lasting progress to be made in the Alpha Phase. These organisations will bring actual use cases to be exercised during the Sprints of the Alpha Phase.

Given their status and their existing active engagement with the OIA Programme three strong contenders to be invited to participate in the Alpha Project as Relying Parties would be:

- the Social Security Agency;
- the eHealth programme; and
- at least one Local Authority.

As has been demonstrated in the Service Design elements of the Discovery Phase the "user journey" regarding identity is associated more with a task the user is trying to complete rather than a need or desire to establish an identity in a stand-alone manner. For example a user may need to establish their identity to access their (confidential) health records, request a summary of their criminal record or apply for a social security benefit. Therefore it seems likely that the most appropriate way to involve end-users in the Alpha Phase will be via the process flows of the Relying Parties. This is shown in the diagram above where primarily users are interacting with a Relying Party. It must continue to be clear to all concerned that the Alpha Project cannot achieve a successful outcome unless actual End-Users have used the system and have concluded that the system offers significant advantages to them in comparison to the available alternatives.

2.1.2. Integration Solution Providers

The "Service Layer" and the "Abstraction Layer" from the Solution Architecture schematic are assumed to both be provided for the Alpha Phase by one (or possibly two) Integration Solution Providers.

The Solution Characteristics paper suggests that the preferred approach to Middleware is likely to be an "Identity Focussed Hub" and identifies some offerings that are available.

To ensure a level playing field we suggest that the OIA Programme should document its requirements from the Integration Solution for the Alpha Phase and then should invite any provider who can meet those requirements to submit their bid to participate in the Alpha Phase. The programme would then select the bid (or bids) that maximise the likelihood of the Alpha Phase meeting its objectives.

2.1.3. Identity Providers

It is assumed that for the Alpha Phase the programme will work with between 1 and 3 Identity Providers. These Identity Providers will already be active in the market.

Following a similar process to that described above for Integration Solution Providers, the OIA Programme should document its requirements from the Identity Provider Solution for the Alpha Phase and then should invite any provider who can meet those requirements to submit their bid.

Given that myaccount is an existing solution that is owned by the public sector in Scotland it may be that the programme team wishes to include it in the Alpha Phase to determine to what extent it can meet the objectives of the programme:

- either alone or in conjunction with other solutions; and
- as is or with enhancements.

2.2. Structure and Organisation

How should the Alpha Phase be structured and what input is required from the programme team?

This paper proposes a relatively large-scale Alpha Phase on the basis that this will be the best way to make rapid and substantive progress and thereby to ensure that the Alpha Phase produces significant information and useful outputs. Such outputs may potentially include a proven reference implementation that will accelerate a subsequent Beta Phase and the expected move to production use, reducing cost and risk for the programme over the delivery lifecycle.

From our conversations with the Programme Team and our experience of comparable initiatives we suggest that the programme should appoint an experienced industry partner (referred to as the "Alpha Delivery Partner" to undertake the day to day management of the Alpha Phase on behalf of the programme.

Because of the nature of the Alpha Phase (such as use of an Agile approach and the desire to direct effort in accordance with emerging priorities) the programme should provide the overall direction role with supervisory involvement on a regular basis throughout the Alpha Phase. This will allow the programme to ensure that the activities, efforts and outputs of the Alpha Phase best reflect the objectives of the programme including any change or refinement that may occur over the course of time.

Therefore we suggest that a member of the Programme Team should act as Programme Alpha Lead to provide strategic direction and oversight to the Alpha Delivery Partner.

The proposed roles for the Alpha Delivery Partner are as follows:

2.2.1. Product Owner/Scrum Master/Delivery Manager

Key responsibilities:

- Lead the Alpha Delivery Partner team
- Maximise the value of product delivered ("value" to be interpreted in the context of the Alpha Phase purpose and objectives)
- Liaise with Scottish Government Programme Team (particularly the Programme Alpha Lead)
- Ensure user-centric approach is followed
- Provide strategic coordination with Third Parties (IDPs, RPs, ISPs)

2.2.2. Identity Subject Matter Expert

Key responsibilities:

- Provide advice and guidance on strategic direction and decisions
- Ensure best practice approaches from the wider Identity community are adopted (where appropriate)

2.2.3. Technical and Integration Architect

Key responsibilities:

- Set technical direction
- Devise integration approach
- Work with team to address technical and integration challenges
- Provide technical coordination with Third Parties (IDPs, RPs, ISPs)

2.2.4. Technical Delivery Lead

Key responsibilities:

- Lead day to day configuration, customisation, development as required to implement the Alpha Development System
- Implement the direction and approach set by the Technical and Integration Architect
- Implement UX and related suggestions from the UX Lead
- Pursue and resolve specific issues with Third Parties (IDPs, RPs, ISPs)

2.2.5. Technical Deliverer

Key responsibilities:

- Work under the direction of the Technical Delivery Lead as required to implement the Alpha Development System

2.2.6. UX Lead

Key responsibilities:

- Coordinate End-User participation
- Capture End-User input and feedback
- Ensure alignment of Alpha deliverables with Service Design findings
- Ensure UX best practice followed
- Monitor accessibility considerations

2.2.7. QA Analyst

Key responsibilities:

- Test and assure Alpha Phase products to ensure they perform as expected (in the context of the Alpha Solution rather than a Release Candidate for production)
- Log specific issues demonstrate/explain to the Technical Delivery Lead as necessary
- Ensure products of Alpha Phase are readily available for re-use e.g.:
    - secured to appropriate media
    - all necessary scripts and documentation secured
    - all test materials (automated and manual) secured
    - process to re-create (from the secured materials) proven

2.3. Planning and Timescale

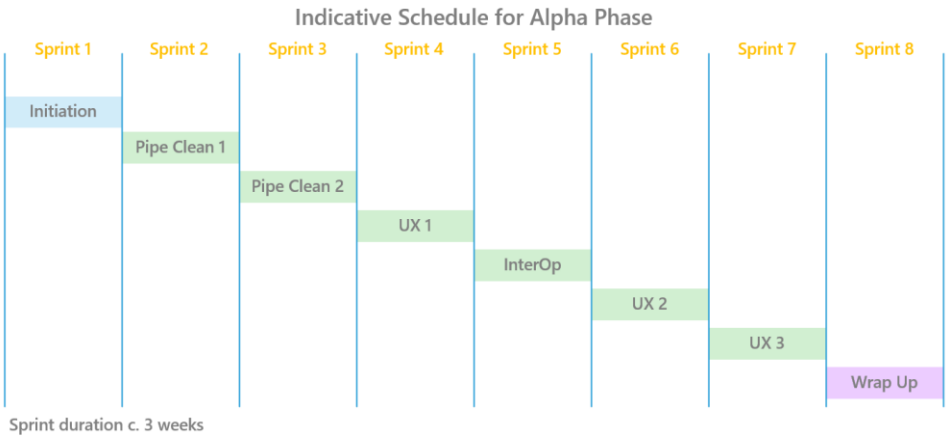
What are the stages of the Alpha Phase and how long is expected to be required?

This section is intended to illustrate how the Alpha Phase could potentially be structured. Clearly this illustrates only one of many potential approaches and variants. It is provided as the basis of further consideration rather than intending to be in any way prescriptive.

This section assumes an Agile approach is being followed. This document does not attempt to explain or justify the use of the Agile methodology; for example the appropriate use of:

- Sprint Planning Meetings;
- Daily Standups;
- Sprint Retrospectives; and
- Sprint Reviews.

If required further information is widely available for example here: www.scrumguides.org and here: www.gov.uk/service-manual.



2.3.1. Illustrative Schedule

The timeline above suggests that the Alpha phase is comprised of 8 Sprints each with 3 weeks duration, giving a total duration of 6 months (allowing for 2 weeks holiday shutdown).

Clearly as an Agile approach is assumed it is not appropriate to specify the detailed goals for each Sprint before the relevant Sprint Planning Meeting, however it is reasonable to set some high-level expectations in advance with the intention of steering the Alpha Phase to supporting achievement of the programme's overall objectives.

2.3.2. Sprint 1 - Initiation

We suggest that the Goals of the first sprint should include:

- assemble the team and address any related housekeeping needs;
- create an initial Product Backlog;
- establish working-level relationships with third parties (such as End-User representatives, IDPs, RPs, and Integration Solution Providers;
- ensure that the UX model is sufficiently well understood, is workable and is as optimised as it can be at this juncture;
- develop the system Technical Design to detail how the Technical Architecture will be realised ("how will X interoperate with Y");
- establish a basic (but functional) Technical Infrastructure for the Alpha Phase; and
- establish basic logging and debugging infrastructure.

At this Sprint the Technical Infrastructure would comprise a minimum number of components supporting a small number of simple transactions. This infrastructure could potentially use "stubs" (i.e. simple software models) to replicate the actual expected behaviour of "typical" IDP and RP systems. These stubs would potentially have value later (possibly after further enhancement) in subsequent Sprints and potentially later in the Programme as a reference implementation and test resource for IDPs, RPs and Integration Solution Providers.

By the end of the Initiation Sprint the OIA Programme should have:

- a description of the OIA Solution and its features;
- a high-level plan for the remainder of the Alpha Phase;
- user Journeys (informed by the Service Design work) that will be explored in the Alpha Project – including the "channels" applicable to each user journey e.g. mobile device, PC browser, telephone, face to face;
- an understanding of existing Identity provision in Scotland and how that relates to the Alpha Project (e.g. forms a part or is excluded for this phase);
- enumerated objectives and risks; and
- the agreed product backlog for commencement.

2.3.3. Sprints 2 and 3 – Pipe Cleaning

The "Pipe Cleaning" sprints would be focussed primarily on the technical integration of the system components to meet the business needs and End-user expectations. This will require the integration components, the RP systems and the IDP systems to be brought together in a single (virtual) system in accordance with the Technical Design. It may be that (in accordance with the Agile methodology) the Technical Design is amended with the benefit of practical experience.

The Goals for Sprint 2 would identify specific incremental improvements to the Technical Infrastructure established in Sprint 1. In particular any integration issues that were surfaced in Sprint 1 would be targeted for investigation and resolution.

The Goals for Sprint 3 should seek to create a Technical Infrastructure that whilst perhaps incomplete and not polished is sufficiently complete and representative to enable (by the end of the Sprint) End-Users and RP stakeholders to be able to interact with the system to gain an understanding of its operation and suggest improvements.

2.3.4. Sprints 4, 6 and 7 – UX

The programme is committed to developing solutions that are user-centric. In support of this it is proposed that three of the core Sprints are focused on the User Experience.

The Goals for Sprints 4, 6 and 7 should be focused on entries in the Product Backlog that have resulted from End-User feedback to ensure that the Alpha system is able to meet End-User needs to the greatest practical extent. Of course the End-User feedback would need to be "moderated" to some degree (prior to inclusion in the Product Backlog) to ensure it aligns with the programme's objectives and does not represent the view of a single individual or a small constituency with specific interests.

During these Sprints consideration should be given to accessibility needs of particular End-User groups, for example to assess interoperation with popular accessibility aids.

The focus of these Sprints on UX should not mean that Product Backlog entries that are focussed purely or largely on infrastructure improvements are excluded from the Sprint Goals.

2.3.5. Sprint 5 – Inter Operability

The Goals for this Sprint would focus mainly on Technical Infrastructure inter-operability and integration improvements, driven by additions to the Product Backlog during previous Sprints (particularly Sprint 4 - it being the first Sprint to focus on UX). This should address any particular technical challenges that are enablers to address one or more Product Backlog entries.

Again the focus on Technical Infrastructure improvements should not prohibit other high priority items from the Product Backlog being addressed.

This Sprint may be an appropriate point to focus on investigating the scenarios that are described in Section 5.3 of the Solutions Characteristics document which are:

- Migration of known user to new authentication credential;
- Growing identity assurance over time;
- Risk based approach; and
- Assured identity from day one

2.3.6. Sprint 8 – Wrap Up

The Goals for this Sprint should focus on ensuring that the value gained during the Alpha Phase is retained.

In particular this Sprint should ensure that all:

- documentation;
- configuration management information;
- scripts;
- bespoke code;
- development "stubs";
- test materials (scripts, data, expected results) for automated and manual testing;
- environment specifications;
- outstanding Product Backlog;
- known issues etc.;

are archived in a manner that allows the entire system (or potentially viable sub-sets) to be re-created in the future. Ideally this should be proven by re-creating in a "clean-room" environment.

2.4. Participation

How will the programme engage with potential Alpha Phase participants?

2.4.1. Alpha Delivery Partner

The role of the Alpha Delivery Partner is described in section 2.2 (Structure and Organisation).

If the Scottish Government is able to identify existing employees who have the necessary experience and knowledge to fill the required roles from its own ranks this is likely to be the best option because:

- it would be expected to have a significantly lower cost;
- knowledge of the Alpha Phase would be retained within the organisation; and
- it would help to enhance the internal skills base.

If it is not possible to find the resources internally then we assume that the Scottish Government would need to procure the delivery partner from the market. The programme team would need to assess whether to go to market for the full team from a single source or to appoint individual contractors for each specific role. The former would be expected to cost more than the latter but would require a more hands-on management approach and might be considered to place more risk with the programme team.

2.4.2. End-User Representatives

For the programme to achieve its ambition of being user-centric it will be vital to include End-User representatives in the Alpha Phase. This will continue the extensive engagement that has already taken place under the Service Design elements of the programme's Discovery Phase.

Building on the materials produced from the Service Design activity End-User's opinions should be sought and used to shape entries in the Product Backlog for the Alpha Phase. End-Users should be selected to seek to represent the range of demographics, including users with accessibility requirements and users of all types of public services.

End-Users should be actively engaged in the Sprints comprising the Alpha Phase including creating, maintaining and prioritising the Product Backlog. They should also be engaged in the delivery of the Sprints by using the solution "hands-on" enabling them to identify what works well, and what does not. In addition this hands-on use of the system may identify that actual End-Users perceive and use the system in ways that may not have been envisaged in the design created by the technical delivery team.

2.4.3. Relying Parties

It is suggested that a small number of Relying Parties are invited to participate in the Alpha Phase. Based on our understanding of the current status of the potential participants we suggest that the following organisations may be good candidates:

- eHealth;
- Social Security Agency; and
- Disclosure Scotland.

These organisations have a number of common features that make them suitable such as:

- recognised need for a digital identity solution;
- need for high levels of assurance (LoA 2) for End-Users; and
- existing positive engagement with the OIA Programme.

Clearly these organisations have a range of use cases and End-User profiles resulting in different needs for Digital Identity services hence ensuring breadth in the functionality to be explored by the Alpha Project.

The OIA Programme would need to agree with the Relying Parties how their costs for participating in the Alpha Phase would be met. For example Relying Parties could meet or their own costs and pay a proportion of the core costs of the Alpha Project or alternatively they could have all their costs met by the OIA Programme. These arrangements will require agreement for the Alpha Project to be viable. We assume this agreement will be pursued through internal discussions within the Scottish Government.

2.4.4. ID Providers and Integration Solution Providers

Whilst the roles of ID Providers and Integration Solution Providers are clearly very different the process for engaging them could be largely the same and therefore they are considered together here.

The Alpha Project must strike a balance between the benefits of exercising a range of ID Provider and Integration solutions against the cost and risk associated with complexity. Therefore it is suggested that a between 1 and 3 IDPs and between 1 and 2 Integration Solution Providers are selected to participate.

Bidders should be encouraged to make their financial offer as attractive as possible. Ideally bidders would determine that they would not expect their participation in the Alpha Phase (itself) to create a profit, rather they should see it as a worthwhile investment in the hope of securing future revenue and profit (although clearly this would not be guaranteed and therefore would be entirely at the bidder's risk).

2.4.5. Test Instances

Relying Parties, ID Providers and Integration Solution Providers would be expected to bring to the Alpha Project access to test instances of their existing or proposed solutions. This would not necessarily require co-location of systems as long as appropriate network connections could be established. The Alpha Project would not use any real data for any individual and should not hold, process or produce any other sensitive or confidential data. Thus any network connections would not require the same security provisions as the equivalent production connections.

These participants would also need to provide appropriate expertise to enable their test instances to be integrated with the remainder of the Alpha Development System.

2.5. Positioning

How will the programme ensure a "level-playing field" (in procurement terms) for subsequent stages?

Whilst commercial strategy per se is outside the scope of this paper we assume that the OIA Programme will wish to ensure a "level playing field" before, during and after the Alpha Phase. The commercial entities to be considered are Identity Providers and Integration Solution Providers.

One approach is as follows:

1. Establish separate sets of requirements for Identity Providers and Integration Solution Providers to participate in the Alpha Phase – making clear the minimum and maximum number of participants to be identified in each category.
2. Run a procurement exercise (which is compliant with applicable regulations) to identify IDPs and (separately) Integration Solution Providers (on the basis of the requirements and bidder responses) that are the "most economically advantageous" towards achieving the objectives of the Alpha Phase.
3. This may require that the selection of the "winner" in each category may influence the most appropriate "runner up" (and so on for the remaining "podium places") in order to achieve diversity in the Alpha Phase solution.

The procurement documents (ITT or equivalent) should make it absolutely clear that the selection of IDPs and Integration Solution Providers for subsequent stages will be independent of the outcome of the Alpha Phase selection.

2.6. Retained Value

How should the programme ensure that usable deliverables and lessons from the Alpha Phase can be built upon in subsequent stages?

We have suggested above that Sprint 8 (the final Sprint of the Alpha Phase) should focus on ensuring that the items developed during the Alpha Phase are suitably curated to ensure that they are readily available for re-use, re-purposing and enhancement in subsequent stages.

The description for Sprint 8 clarifies that anything that may be useful should be retained not just the most obvious things such as bespoke code. Every effort should be made to prove that the materials that

are retained are complete and viable – for example by recreating environments from scratch using those materials.

A report of the overall Alpha Phase should be created to document what was (and was not) achieved during the Alpha Phase to inform subsequent management decisions such as:

1. Is the programme viable (with or without major or minor changes in approach)?
2. Are any changes required to ensure the programme and its outputs are user-centric?
3. What next steps are recommended (e.g. to shape a Beta Phase)?
4. Are changes required to the Technical Design (and therefore the Technical Infrastructure) developed during the Alpha Phase?

3. OIA Alpha Phase – Initial Risk Analysis

3.1. Risk Analysis Overview

A key objective of the Alpha Phase is the early identification of risks. GDS recommends the use of the following risk categories:

- design;
- business process; and
- technical.

In this context a risk can be defined as "*an uncertain event that, should it occur, would impact the achievement of objectives*". Risk statements will therefore capture events that may occur in the future. Usually a risk has a negative impact but it is possible for such an "uncertain event" to have a positive impact.

Identifying risks will enable the OIA Programme to put in place appropriate mitigation.

3.2. OIA Alpha Phase – Design Risks

Design risks are risks associated with the user-centric service design, rather than the technical design of the service.

For the OIA Solution design risks to be assessed during the Alpha Phase could include:

- End-Users do not consider the service to be worth using;
- End-Users do not understand the key concepts of the OIA Solution;
- End-Users are not able to use the service to achieve defined outcomes;
- End-Users have privacy or security concerns with using the OIA Solution;
- End-Users are unable to recover from error conditions; and
- Support channels for End-Users are insufficient to meet their needs.

3.3. OIA Alpha Phase – Business Risks

For the OIA Solution business risks to be assessed during the Alpha Phase could include:

- Relying Parties do not wish to engage with the OIA Solution;
- Relying Parties are not able to integrate business processes with the OIA Solution;
- Relying Parties have incompatible service requirements;
- Identity Providers are not able to provide a service that is usable by a large proportion of the Target Cohort;
- The OIA Solution cannot be cost justified;
- OIA Solution flexibility objectives cannot be met; and
- It is impractical to create a reliable and supportable OIA Solution (from business and End-User perspectives).

3.4. OIA Alpha Phase – Technical Risks

For the OIA Solution technical risks to be assessed during the Alpha Phase could include:

- Relying Parties are not able to integrate their existing and/or future digital services with the OIA Solution;
- The OIA Solution is not able to meet quality expectations such as:
    - reliability;
    - performance; and
    - accuracy;
- The OIA Solution is not able to meet internal and external stakeholder's privacy and security expectations;
- Identity Provider services do not support the OIA Solution as expected; and
- Implementing the OIA Solution to meet the service's objectives is more expensive and/or time consuming than expected.

Appendix 1 – Version Control

Version	Date	Summary of Changes
0.01	08-May-18	First draft for internal review
0.02	09-May-18	Draft for Programme Team review
1.00	01-Jun-18	Initial Baseline – addressing review comments