# *Ofcom customer switching consultation*

An independent cost assessment of the alternative GPL TPV model

May 2012

**pwc**

DISCLAIMER:

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# *1 Executive summary*

Over recent years, Ofcom has been trying to address issues with existing processes that take place when consumers switch communications services. In September 2010, Ofcom published a consultation document – *Strategic review of consumer switching*[1] – that sought to identify the key issues and problems with the switching processes across the fixed and mobile telecommunications, broadband and pay TV sectors.

Following this consultative document, Ofcom established the Switching Working Group (SWG) to consider the problems with the existing switching processes and to develop specifications and costs for different switching process options for fixed voice and broadband services on the Openreach copper network.

Ofcom evaluated a number of potential solutions to these issues and formed the view, subject to further consultation, that a Gaining Provider Led (GPL) process, together with a Third Party Validation function (TPV), is the most appropriate model.

PricewaterhouseCoopers LLP (PwC) has been commissioned by a group of Communication Providers (CPs) which includes British Sky Broadcasting Ltd. (BSkyB), British Telecom (BT) and Virgin Media, to prepare an independent estimate of the costs to set up and to operate a Gaining Provider Led Third Party Validation (GPL TPV) process.

We estimate that, in the base case scenario, the net present cost (discounted based on the social rate of time preference of 3.5% in real terms published by HM Treasury[2]) over 10 years to implement and operate on an on-going basis a GPL TPV model[3] will be £139,296,000 .

Our independent cost assessment found the GPL TPV model to cost between £90,103,000 and £195,663,000 to set up and run for a 10 year period. The initial cost to set up is estimated to be between £42,948,000 and £79,089,000 followed by an annual on-going cost of between £5,670,000 and £14,017,000 .

Our high level results are shown in the tables below.

*Table 1 NPC for GPL TPV over a 5 and 10 year time frame*

|  | **Base case scenario** | **Low case scenario** | **High case scenario** |
| --- | --- | --- | --- |
| 5 year | £103,550,000 | £68,548,000 | £142,376,000 |
| 10 year | £139,296,000 | £90,103,000 | £195,663,000 |

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[1] See http://stakeholders.ofcom.org.uk/binaries/consultations/consumer-switching/summary/switching.pdf

[2] See http://www.hm-treasury.gov.uk/d/green_book_complete.pdf, p98.

[3] Please note that throughout this report, we have considered the alternative TPV model presented by CSMG in its report "Switching Options: An Assessment of Potential Costs", page 5

*Table 2 GPL TPV set up and on-going costs*

|  | **Base case scenario** | **Low case scenario** | **High case scenario** |
|---|---|---|---|
| Set up costs | £61,095,000 | £42,948,000 | £79,089,000 |
| Annual on-going costs | £9,403,000 | £5,670,000 | £14,017,000 |

We expect the actual costs to be more likely to increase rather than decrease. This is because, in our experience, it is more likely that the variation in labour and licences costs, project duration and quantum of resources required will be positive rather than negative.

The costs of the GPL TPV model can be grouped into five main categories as described in the table below.

*Table 3 Description of key cost categories*

| **Cost source** | **Objective** |
|---|---|
| Commissioning Board | Required to set up, govern and control a programme to "make things happen" in a controlled, timely way |
| ServCo. | Required to direct and manage operational performance in service delivery and to allow services to respond to change over time |
| Hub Services | Delivery of automated data storage, data processing, data communications, CP API interface to support TPV and CP processing requirements, plus human delivered services for issues (for example fault reporting) and change management (for example connecting in a new outsourcer selling on behalf of a CP/CPs) |
| TPV Services | Delivery of the per sales consent validation and account unlock outputs required by revised industry processes |
| CPs | Delivery of changes to CP processes, systems and organisations to support revised industry sales process that are integrated end to end |

Within these, the number of CPs that need to run independent IT change projects is a key cost driver. The design assumes that these costs are limited by "Third Party Integrators" playing a key role in the provision of solutions to the smaller CPs. This has the effect of reducing the number of significant unique projects from over 300 to less than 30.

We have broken these cost categories down further in terms of set up and on-going costs:

1.   The Commissioning Board activities:

    –   The costs for activities of commissioning and programme management during set up phase total between £3,038,000 and £5,873,000 , with a base cost estimate of £4,418,000 ;
    –   The costs for activities of governance and supervision on an on-going basis are estimated to be between £66,000 and £185,000 per year, with a base cost estimate of £118,000 per year.

2.   The ServCo:

    –   The costs for the set up of the ServCo entity total between £659,000 and £1,127,000 , with a base cost estimate of £882,000 ; these comprise expert input required to design and structure ServCo. and recruitment fees for-FTEs;

- The running costs for ServCo. will be between £769,000 and £1,459,000 per year, with a base cost estimate of £1,073,000 per year, which consists largely of payroll (base salary, national insurance contribution costs, bonus and benefits), and rental costs.

3. The Hub services:

- The costs for the set up of the Hub total between £5,018,000 and £9,320,000 , with a base cost estimate of £7,169,000 ; these comprise drafting of the high level design, issuance of RFP and supplier selection, infrastructure installation, systems development and integration testing.
- The annual running costs will be between £1,074,000 and £1,994,000 , with a base cost estimate of £1,534,000 .

4. The TPV services:

- The costs for the set up of TPV services and CP investment in Voice ICT preparations total between £5,983,000 and £10,306,000 , with a base cost estimate of £8,270,000 ;
- The running costs for TPV services will be between £2,134,000 and £7,358,000 per year, with a base cost estimate of £4,354,000 per year, which consists of call handling costs and transfer of account details costs.

5. Changes to industry processes and interfaces:

- The costs for changes to industry processes and interfaces total between £28,250,000 and £52,463,000 , with a base cost estimate of £40,356,000 ;
- The on-going annual costs of integration with ServCo. are between £1,627,000 and £3,021,000 , with a base cost estimate of £2,324,000 .

Our cost assessment includes the incremental industry costs to set up and run the proposed GPL TPV model, to the standards against which we expect contracting suppliers and vendors to be able to deliver.

Our cost estimation is based on the definition of the GPL TPV model provided by Ofcom together with the SWG specifications, as amended by Ofcom. To properly estimate costs it was first necessary to define the GPL TPV model in some detail. To derive this definition, we have satisfied five key requirements, namely:

- *The definition of what entities are required, their relationship to one another, and the new capabilities required* – our analysis shows that the GPL TPV model requires the industry to endorse significant changes in the way it delivers customer switching services and the creation of new entities (namely ServCo., the TPV provider, the Hub and the Commissioning Board);
- *The precise and complete definition of the services that will be supplied for the GPL TPV model to work effectively* – our definition of services provided within the GPL TPV model is "The GPL TPV model will provide authentication and consent validation services as part of a single standardised switching process for consumer fixed telephony and broadband services in the UK over the Openreach copper network";
- *The definition of the processes required to deliver the Hub and TPV services* – we identify eight high level business processes that will ensure that ServCo. delivers TPV and Hub services to the requirements of consumers, industry and the regulator;
- *The definition of the type of organisation required to deliver the Hub and TPV services* – on the basis of cost minimisation, we present an outsourced operating model, with a lean, expert management team tasked with ensuring the delivery of services at the required levels. This operating model ensures that services are delivered in the most cost effective fashion;
- *The identification and definition of the necessary steps for implementing the new model* – we detail the role of the Commissioning Board in governing and funding the programme of work required for GPL TPV to become operational.

The original cost estimation provided by Ofcom in the February 2012 consultation document is substantially lower than our assessment of the cost. In the figure below, we provide a breakdown of how our cost estimates compares with CSMG's independent TPV cost model.

*Figure 1-1 Comparison of our findings against CSMG's (10 year NPC with a discount rate of 3.5% applied)*
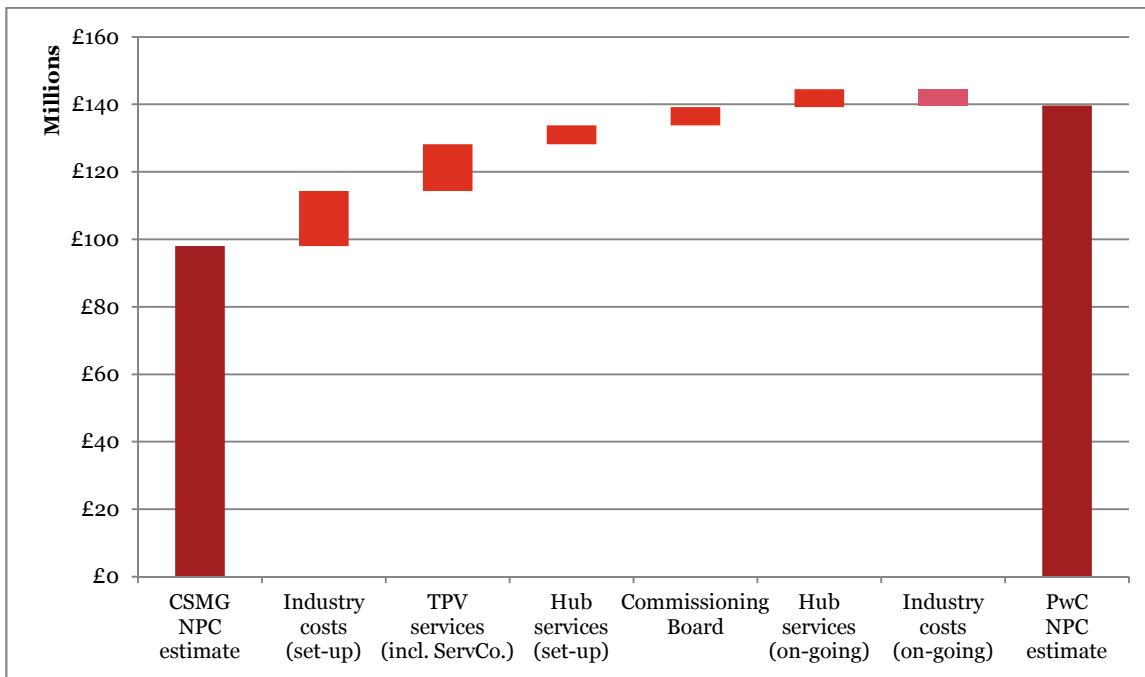


*Source: PwC*

We have identified the following six reasons for the variance between the two assessments:

- *Industry costs (set up)* – this source of variance reflects cost differences between our estimates and CSMG's for the costs incurred by industry players for preparing to interface with the GPL TPV model:

    - CSMG's independent estimate evaluated the NPC of industry over 10 years to be £24,058,000 , whilst we have estimated the cost to be £40,356,000 ;
    - This variance of £16,298,000 is explained by a difference in assumptions regarding the total amount of effort required to implement the changes.

- *TPV services (including ServCo.)* – this source of variance reflects cost differences in our estimates for TPV services and the cost of setting up and running ServCo.:

    - CSMG's independent estimate evaluated the NPC of TPV services over 10 years to be £40,843,000 whilst we have estimated this cost to be £54,286,000 ; and
    - This variance, of £13,443,000 , is mostly driven by difference in estimates of annual cancellation volumes and assumed quality of TPV services provided.

- *Hub services (set up)* – this source of variance reflects the cost differences between our estimates and CSMG's for setting up the Hub services:

    - CSMG's estimate evaluated the NPC of Hub services over 10 years to be £1,550,000 , whilst we have estimated this cost to be £7,169,000 ;
    - This variance of £5,619,000 is explained by differences in the assumed capital required for Hub infrastructures and the effort to implement it; and
    - We have not included any other costs for reinvestment apart from a five year hardware refresh in our cost assessment.

- *Commissioning board* – this source of variance reflects differences in cost estimations concerning the setting up of the programme that will oversee the launch of the GPL TPV model:

- CSMG's estimate did not contemplate the requirement for a Commissioning Board. Given the complexity of delivering the change required, and the significance of the industry impacts that the GPL TPV model will entail we consider the establishment of a Commissioning Board as essential to ensure an efficient delivery of the GPL TPV model and subsequently to manage and steer the activities of ServCo;
  - The inclusion of the Commission Board contributes £5,399,000 to the 10 year NPC.

- *Hub services (on-going)* – this source of variance reflects cost differences in our estimates for on-going running of Hub services:

  - CSMG's estimate evaluated the NPC of on-going costs of Hub services to be £7,402,000 , whilst we have estimated this cost to be £12,758,000 ;
  - Since both cost estimates are based on a percentage of the capital cost for setting up the Hub, the variance of £5,356,00 is primarily due to differences in set-up costs.

- *Industry costs (on-going)* – this source of variance reflects cost differences in our estimates for the costs incurred by CPs for on-going interactions with CSMG.

  - CSMG's independent estimate evaluated the NPC of industry costs to be £24,144,000 whilst we have estimated it to be £19,328,000 ;
  - There is therefore a variance of-£4,816,000 , explained by different methodologies to estimate this cost category. Our cost estimates specifically allow for additional maintenance and support costs for B2B interface capacity and additional effort to support problems arising in LPs to manage the switching process. CSMG, however, calculated this cost by assuming 20% of capital build costs.

In conclusion our cost estimate of the NPC of the GPL TPV model over a 10 year period is substantially (42%) higher than CSMG's. This is largely because we have identified cost areas that were not included in the CSMG analysis (such as the Commissioning Board) and have gathered an evidence base of inputs used in our cost assessment that is at variance with those adopted by CSMG.

# 2 Background and context

In this section we provide a summary of the background to this report, including an overview of the switching problems Ofcom is seeking to address. We detail the objectives and scope of the cost assessment together with our method and approach. We also outline the structure of the remainder of this document.

## 2.1 Ofcom's consultation

In its consultation document – *A consultation on proposals to change the processes for switching fixed voice and broadband providers on the Openreach copper network, (February 2012)* – Ofcom sought to:

• Identify the key issues and problems with current switching processes; and
• Set out a strategic vision for a preferred model of a switching process.

Ofcom considered alternative possible interventions in relation to the process of consumer and small business switching in the UK broadband and fixed line telephony sector delivered over Openreach copper network. The three options under consideration, for which Ofcom has estimated the costs and benefits, are described in the table below.

*Table 4 Switching model options summary*

| Option | Acronym | Overview |
|---|---|---|
| Unique Service Number model | USN | A GPL process in which consumers would need to provide a gaining provider (GP) with a code from their bill in order to switch provider. The code is used to assist the GP in customer authentication and in identifying the correct services to be switched. |
| Third Party Verification 'Gatekeeper' model | TPV | A GPL process where consumers need to go through an independent third party to confirm and record their consent to switch. |
| Losing Provider Led Transfer Code model | LPL TxC | A Losing Provide Led (LPL) transfer code option where customers need to obtain a code from their Losing Provider (LP) and provide this to the GP. |

### 2.1.1.1 The GPL TPV model

The GPL TPV model is Ofcom's preferred switching model. In its cost-benefit assessment, informed by Cambridge Strategic Management Group's (CSMG) independent cost assessment, Ofcom found this model to be the most effective in tackling the identified problems.

Under Ofcom's preferred version of the GPL TPV model:

• All CPs need to be able to send information to a centralised system, the "Hub;"
• The GP agent completes the sale before transferring the customer to a contact centre queue for a TPV customer service representative to obtain (or not) validation of customer consent. When the customer is placed into the queue, the GP agent does not stay on the TPV call with the customer. This differs from the original SWG specification in which the GP agent would remain on the call while the customer spoke to the TPV agent.;
• Customers will be able to cancel their switches, during the transfer period, by calling an automated Customer Cancel System, or a live TPV agent;
• Once the TPV service provider has validated consent, it "unlocks" the customer's record on the Hub. This allows the GP to access all of the information in a service record, which contains all the information needed to start a switch.

The GPL TPV model is reliant upon the establishment of new entities - including a Hub and TPV service provider - and also depends upon existing Third Party Integrators being able to execute an important role in allowing the participation of smaller CPs, as well as any outsourced call centres or telemarketing services used in the sales process:

- The TPV entity delivers and manages the third party verification services;
- The Hub's primary function is to hold a record of all consumer services on the Openreach copper network. This includes details of the service provisioning technology used, thus providing simplified identification of the back-end process to adopt when switching. The Hub also provides a service locking and tracking mechanism to monitor authorised switches and their progress;
- Third Party Integrators are essential for "binding" in smaller CPs and Telemarketing organisation to the industry systems in a cost effective way. Their role, if successful, will greatly reduce the number of projects, complexity and cost.

### 2.1.2 CSMG assessment of costs of these options

A key input to the consultation and Ofcom's initial findings was an assessment of costs made by CSMG, a consulting firm engaged by Ofcom. CSMG's work was to take descriptions of the options for potential standard processes for customer switching and to evaluate the cost of implementing these processes in the UK fixed voice and broadband markets. This was summarised in CSMG's *Switching Options: An Assessment of Potential Costs*.

CSMG presented two methods of assessing cost:

- First, a review building on industry provided cost estimates in response to the question of incremental costs associated with each of the proposed switching models, in particular:

    - CSMG tiered CP responses into three segments (tier A, B and C), reflecting the varying degree of complexity in the operations of the CPs, where tier C are the most complex and, generally, are the largest with a customer base of over one million fixed line customers;
    - CSMG reviewed the impact on CPs against the TM Forum eTOM and TAM – this approach was used to identify areas of process and systems impact;
    - Costs were apportioned to each of the appropriate impact areas, on a per tier basis;
    - Tiers C and B have costs across all systems and process areas, with tier C bearing the greater proportion, while tier A only have process impact;
    - CSMG based their cost estimates on their judgement of infrastructure costs, and implementation time;
    - CSMG used the systems costs for tier B CPs as the basis for their costs to TPIs and wholesale operators.

- Second, an independent cost estimate by CSMG based on the creation of Hub and TPV service delivery capability.

CSMG estimated the cost of the GPL TPV model to be more expensive than the other models with the net present costs (NPC) of GPL TPV over 10 years valued at £98m.

## 2.2 Objectives of this cost assessment

As part of the consultation process, Ofcom invited written views and comments on the issues raised in its document. Following the end of this consultation, Ofcom has stated its intent to publish a further consultation in Q2/Q3 2012-13 and a decision in Q4 2012-13.

As part of the response to the consultation process, we were engaged by a group of service providers (BSkyB, Virgin Media and BT) to:

- Undertake an independent assessment of the set up and on-going cost of implementing a GPL TPV model in the UK;

- Critique the CSMG report as a basis for reliable estimates of the costs to industry of the options evaluated by Ofcom.

## 2.3 Scope of this cost assessment

This report assesses all the incremental industry costs of setting up and running the proposed GPL TPV model, to the standards that we expect contracting suppliers and vendors to deliver against, providing a realistic, robust budget for the programme. Our cost assessment is based on a single service level that meets the minimum standards required by CPs and that complies with the Ofcom/SWG specifications for the GPL TPV model.

The scope is limited to assessing the pre-tax costs of setting up and running the proposed GPL TPV model for switching fixed line (voice and broadband) service providers on the Openreach copper network. We assess:

- The costs associated with the set up and running of a Commissioning Board, an industry-sponsored entity responsible for managing the programme for setting up the GPL TPV model and for overseeing it on an on-going basis;

- The set up and running of two new service delivery components TPV service delivery entity(ies) and a Hub and;

- The costs of alterations/enhancements made to industry interfaces.

The costs analysed are those in relation to the switching model for individual consumers and businesses with less than 10 employees.

For areas of the model which have not yet been defined in sufficient detail by Ofcom/SWG, to facilitate our assessment of costs, we have evaluated the main alternative detailed design options, assessed the impacts on costs and, where it has been necessary to make a design choice, we provided the rationale for our choice. We have selected the most cost effective option that is consistent with the service requirements (detailed in section 3.2.1). Where the options available are cost neutral we refrain from a detailed options evaluation.

This report does not explore or assess the benefits of any of the proposed switching models. Nor do we critique any assessment of the benefits of the GPL TPV model.

Any incremental costs which may be incurred by Ofcom in relation to the set up or supervision of the GPL TPV model have not been considered or included.

## 2.4 Basis of our findings

Here we detail the team, method and approach we have used to develop and cost an exhaustive design of the GPL TPV model.

### 2.4.1 Expert team

We have deployed an expert team with experience of designing contact centre operations and IT solutions, business planning and telecommunications regulation and economics.

*Table 5 Team experience*

| Team Member | Relevant experience |
|---|---|
| Alastair Macpherson | 25 years' experience working in the telecommunications industry. |
| | Regulatory expertise across a wide range of issues. |
| | Acted as an expert in regulatory, competition and arbitration proceedings, including UK Competition Commission, Competition Appeals Tribunal, EC DG Competition and London Court of International Arbitration. |
| David Costelloe | Review of over 70 call centre operations, including substantive implementation projects. |
| | Procurement projects with most key UK contact centre outsource service suppliers. |
| | Start up operations for example Energis, RWE. |
| | 25 years' experience working in the telecommunications industry. |
| | Practical experience of delivering complex implementation (for example Ofgem 1998 Programme, start up.) |
| | Diligence of business plan and implementation risk. |
| John Ridley | 16 years' experience in delivery of business and technical solutions . |
| | Development and delivery of integrated industry solutions, addressing complex interactions between business requirements, processes, systems and organisation. |
| | Project assurance and direction to major IT-enabled business transformations. |
| Riccardo Ottolenghi | Over 10 years' experience on the strategic, operational and financial challenges of designing, implementing and managing profit- and satisfaction-enhancing customer experiences. |
| | Developed several cost models and business cases for a telecoms clients. |
| | Managed more than 20 consulting projects across industries. |
| Richard Webb | Certified IT architect with 10 years' experience designing and implementing enterprise systems and storage solutions. |
| | Detailed knowledge of systems, architectures, systems management, networking and application design techniques. |

## 2.4.2 Method and approach

We have used our operational frameworks and methods to define;

• A Target Operating Model (TOM) for the new and changed entities, and
• The transformation activities required to implement the TOM

The diagram below summarises the TOM framework we have used to ensure that we have a complete assessment of cost. It also acts as a roadmap for *section 3.4* of this document.

*Figure 2-1 The PwC Target Operating Model framework*
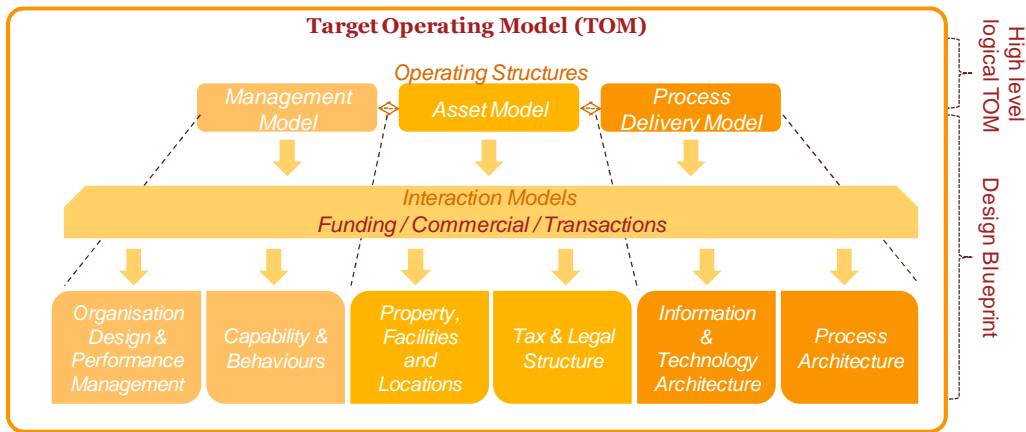


*Source: PwC*

Further details on the framework are provided in the *Appendix A*.

The goal has been to generate the level of detail that would be sufficient to generate cost estimates from a procurement perspective, using PwC comparative analysis, market knowledge and experience as a proxy for potential vendor costs.

For areas of the model which are yet to be defined by Ofcom/SWG we have undertaken an evaluation of the options and selected the most cost effective option in accordance with SWG requirements.

There are six key questions that we have addressed in developing our independent cost assessment. These key questions have informed the structure of our report.

*Figure 2-2 Key questions we addressed in developing our assessment*



*Source: PwC*

## 2.4.2.1  *What is the GPL TPV model and what set of entities will be required to deliver it?*

Firstly, in *section 3.1* we define what the GPL TPV model will look like and we establish the most cost effective set of entities required.

- *End to end system* – to ensure that we cover all industry entities in the GPL TPV process we define the future-state end to end system;
- *Number of TPV service delivery entities (ServCo.'s)* – we have evaluated the impact of having multiple *ServCo.'s* in the model;

- *Hub/TPV relationships* – we have assessed the options for, and implications of, different models of Hub ownership.

### 2.4.2.2  What services will be provided within the GPL TPV model and at what level?

Secondly, in *section 3.2*, we identify the services that ServCo(s) will be set up to provide and the service levels required.

- *Current switching processes problems* – to ensure that our service definition is appropriate, we referred to the Ofcom-identified problems with the current switching process;
- *Service definition* – we have developed a comprehensive and detailed definition of the services that ServCo. is set up to provide;
- *TPV service components* – based on the service definition, we have identified the key service components underpinning it.

### 2.4.2.3  What processes will the entities in the GPL TPV model execute to provide these services?

Thirdly, in *section 3.3* we define the major processes that the ServCo, Hub and industry commissioning bodies need to execute in operations and from a management perspective to deliver services at the required levels.

- *End to end process lifecycle* – we have developed a high-level view of the end to end processes that will support ServCo.'s service delivery;
- *eTOM and TAM* – we have referred to TM Forum frameworks for business processes (eTOM) to develop a comprehensive view of the sub-processes involved;

### 2.4.2.4  What organisations are required and how big do they need to be?

Fourthly, in *section 3.4*, we define the type of organisation that the ServCo entity(ies) needs to be in order to deliver these processes.

- *TOM framework* – using our Target Operating Model (TOM) framework, we have identified all the discrete component parts of the ServCo. operating model;
- *Define TOM* – we developed a robust high-level Target Operating Model for the ServCo entity.

### 2.4.2.5  What needs to be done for the GPL TPV model to become functional?

Fifthly, in *section 3.5*, we explore the programme of work required for GPL TPV model to become operational:

- *Transition* – we have described how the transition from the current to the future state will be funded and managed;
- *Transformation activities* – in order to identify the costs of implementing the programme we have detailed the key activities that will need to be undertaken.

### 2.4.2.6  How much will it cost to set up and run the activities and changes required for GPL TPV?

Finally, in *section 4*, we identify the costs of each of the elements of the GPL TPV model.

- *Cost identification* – for each of the discrete parts of the GPL TPV model, we have identified a list of cost elements that must be included.
- *Cost estimates* – in order to derive an evaluation of the costs identified we have gathered a robust evidence base for assessing the costs.
- *Cost evaluation* – having identified the cost elements and documented the basis on which our estimates were made, we perform the cost evaluation for GPL TPV model.

## 2.4.3  Note on scenario analysis employed in our cost assessment

In our cost assessment we have included in our analysis three scenarios:

1.  *Base scenario* – this is the scenario that includes all the inputs, in terms of cost, effort and quality that we would expect from standard practice in the development and running of this type of operations:

    –   We expect the actual costs to be more likely to increase rather than decrease. This is because, in our experience, it is more likely that variation in labour and licences costs, project duration and quantum of resources required will be positive rather than negative.

2.  *Low case scenario* – this is the first hypothetical sensitivity contemplated by our analysis in which the GPL TPV model would be substantially <u>less</u> expensive than under the base scenario; in this scenario, all inputs being susceptible to variation, have been reduced by 30% compared to the base scenario; please note that the effect of reduction in this scenario is, at times, compounded:

    –   For example, in the case of TPV services, where cost drivers are the unit cost per usable minute, the duration of the call and the annual volume of calls, in the Low case scenario we have modelled a reduction of 30% in the duration of calls (from 226 seconds to 158 seconds) <u>and</u> in the annual volume of calls (from 2,375,162 call per annum to 1,662,613 ; cost per productive minute was not changed in our scenario analysis, due to the fact the this input is based on PwC benchmarks and we do not expect it to vary under normal circumstances). The resulting effect is approximately a 50% reduction in annual TPV services costs.

3.  *High case scenario* – this is the second hypothetical sensitivity contemplated by our analysis in which the GPL TPV model would be substantially <u>more</u> expensive than under the base scenario, under which we have increased costs by 30% compared to the base scenario. It should be noted that the effect of the increase in this scenario is, at times, compounded, as explained in the example above.

The high and low case sensitivities highlight the fact that some inputs to the model – whether they are cost, effort or quality estimates - are particularly sensitive to input variations, (TPV services is a notable example in this regard). This analysis helps decision makers understand the scale and location of risks associated with the GPL TPV model, and of the underlying assumptions that must be verified to mitigate these risks.

## 2.5  Outline of the remainder of this document

The remainder of this document is structured as follows:

*   *Section 3, Defining a GPL TPV model that delivers against SWG's specifications*, sets out the GPL TPV model, service definition, key processes, organisational structure and implementation requirements;
*   *Section 4, Developing an independent cost assessment for setting up and running the GPL TPV model*, details the set up and on-going costs of the GLP TPV model;
*   *Section 5, Comparison of CSMG and PwC cost estimates*, provides a comparison to the CSMG report;
*   *Section 6, Our method for developing an independent cost assessment*, provides an overview of our methodology including project approach and key assumptions;
*   *Section 7, Conclusions*, summarises our findings.

# 3 Defining a GPL TPV model that delivers against SWG's specifications

In our experience, cost levels of such operations are driven directly by the services provided, service levels, processes and the operating model of the organisation. In this section we expand on the SWG specification in order to identify more fully the cost structure and cost drivers of a fully operational GPL TPV model, as input to our cost estimates.

As such, this section sets out the basis upon which our costs estimates are made. This includes: a description of the GPL TPV model and the entities required to deliver it; the services and service levels that will be delivered under the model; the processes required to execute these services; a description of the organisations that will be required to deliver the model; and, the steps that will need to be taken for the GPL TPV model to become functional.

## 3.1 What is the GPL TPV model and what set of entities will be required to deliver it?

GPL TPV is a gaining provider led model which requires services provisioned by an independent third party entity to validate a customer's consent to switch their service(s).

The GPL TPV process entails the following steps:

- The consumer speaks to the GP and elects to switch their services to the GP. The consumer provides an account reference number in relation to their current provider. Should they not have this to hand the GP sales agent may use other information, such as name, address, postcode, Customer Line Identification (CLI) and current provider, to identify their account and services through a central Hub database. The sales agent will complete the sale and locate the customer line;
- The customer is then transferred to the independent TPV provider. The sale is completed prior to the transfer and, following the transfer, the GP will withdraw from the call. The TPV customer service advisor will ask the customer to confirm their identity and consent to switch, and this statement will be recorded and stored. Following this the TPV customer service advisor will terminate the call;
- TPV requests that the customer's records are unlocked in preparation for the switch. If the service(s) have not been 'unlocked' this would suggest that consent had not been given, and the GP would be unable to acquire the Transfer Code from the Hub;
- The GP is notified by the TPV provider electronically that the process customer consent has been provided. The GP will then request a Transfer Code from the Hub to the back-end switching process. (Should the TPV customer service advisor be unable to validate customer consent successfully, the TPV provider will notify the GP that validation has been unsuccessful and the GP sales agent can then choose to call back the customer to enquire further);
- The Hub will forward a request to the LP with the customer information, who will verify the customer account. The LP verifies the customer account and requests a Transfer Code up its supply chain. The CP's Access Operator requests the Transfer Code from the Hub and this is passed down the supply chain. The assets involved in the switch are tagged and the code forwarded to the GP;
- The GP will send out a welcome letter setting out details of the new service and containing the date for the switch to happen. The LP will also send a written communication detailing the implications of the switch, such as any relevant termination charges and impact on other services;
- If a customer does not cancel through the TPV service provider, via either automated online or call centre mechanisms within the 10 day transfer period, the service is switched.

Below is a diagram of the process.

*Figure 3-1 SWG Use Case – 'TPV + Account Ref' Model*
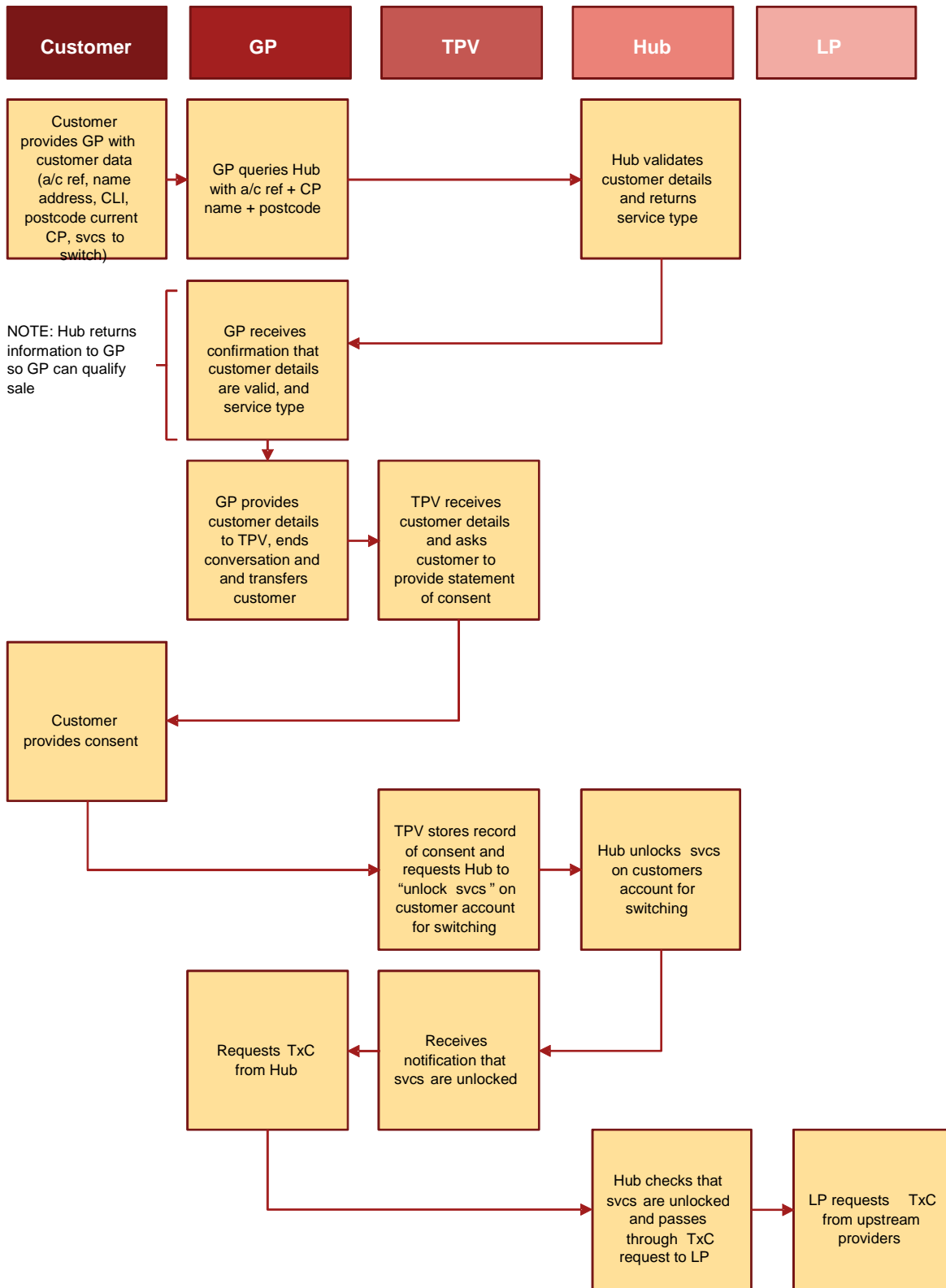


*Source: SWG Switching Process Use Cases - "TPV + Account Ref" Model as amended by Ofcom*

The TPV service will be provided via telephone (for telesales, retail shop and door-to-door sales) and via a web form for online sales. The back-end inter-CP switching processes are expected to remain largely the same as existing processes.

Although Ofcom discusses how the TPV GPL model could address problems associated with home moves or Working Line Take Over (WLTO), the SWG use cases do not address this problem. There is an implied enhancement which could be made to use TxC to assist with WLTO, however, this is not defined in specific detail and has not been included in our model.

### 3.1.1  The GPL TPV model end to end system

There are currently multiple switching processes employed in the UK. The method of switching varies depending on the underlying technology used to deliver the services. The table below lists the current switching processes that are within the scope of this report.

*Table 6 Current switching processes for communications services*

| Switching process | Description |
| --- | --- |
| Notice of Transfer (NoT) | A GPL process relevant for fixed-line (using Wholesale Line Rental or Metallic Path Facility, MPF) and broadband (using MPF) |
| MAC process (Migration Authorisation Code) | MAC is a LPL process that applies to broadband only (using BT Wholesale product – IPstream or SMPF) |

Ofcom provides in its consultation document diagrams that explain the envisioned switching processes. We present these diagrams in the figures below.

*Figure 3-2 The NoT process*
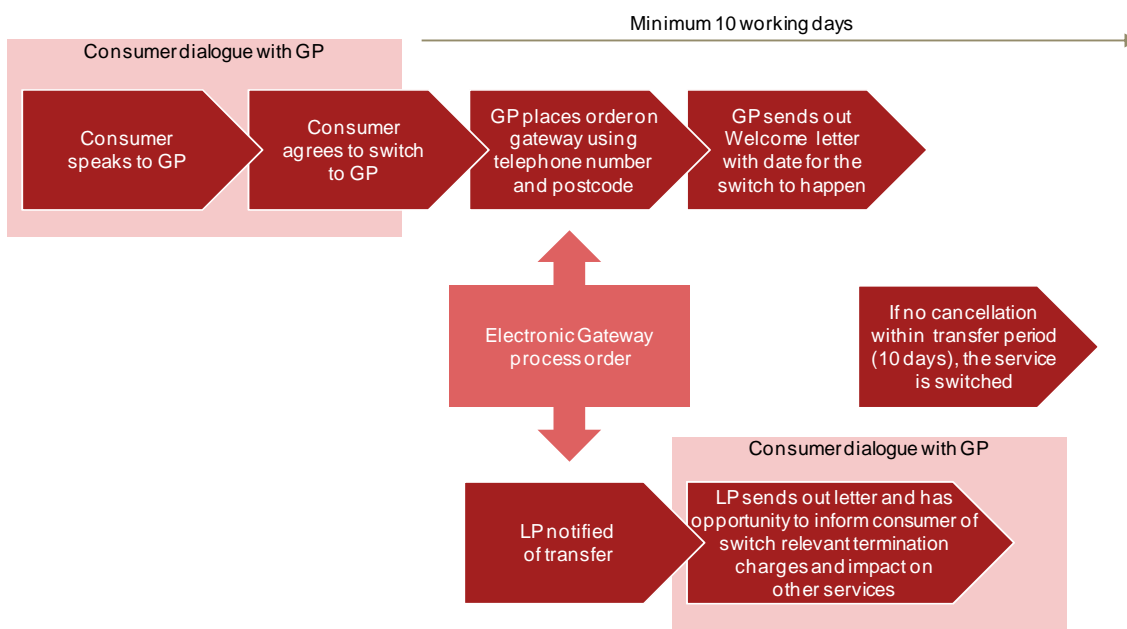


*Source: Ofcom*

*Figure 3-3 The MAC process*
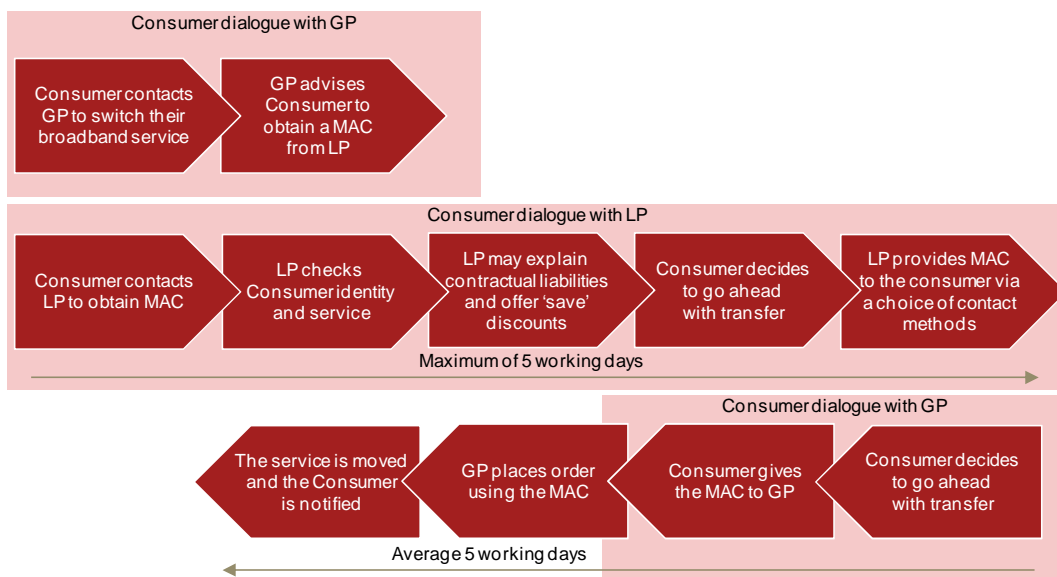


*Source: Ofcom*

The GPL TPV model introduces a number of new entities into the customer switching "ecosystem".

*Figure 3-4 GPL TPV ecosystem*



Legend:
AO = Access Operator
CP = Communications Provider
TPI = Third Party Integrator
TPV = Third Party Verification
WCP = Wholesale Communications Provider
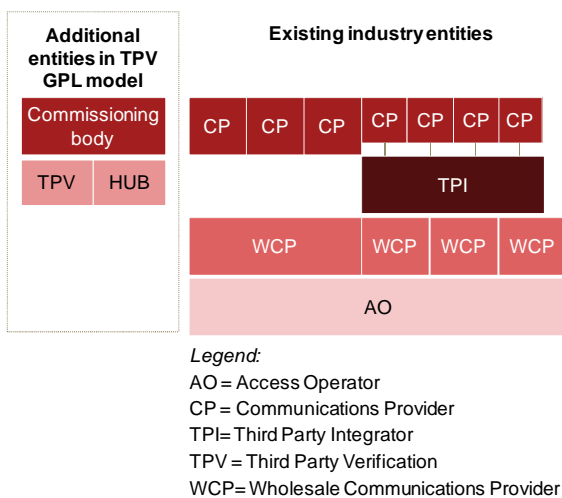
*Source: PwC*

The CPs and other relevant industry players, such as Openreach and Wholesale providers ( BT Wholesale and Cable & Wireless), set up and fund the *Commissioning Board*. The industry players set objectives for the Commissioning Board and delegate decision-making power and allocate budget so that the Commissioning Board may achieve those objectives. The CPs and other relevant industry players then contract independently with the new delivery entities for the provision of TPV and Hub services. In terms of process:

- The Gaining Provider uses the Hub to validate customer details and transfers the customer to the TPV provider for the customer to provide consent. The GP requests the Transfer Code (TxC) from the Hub.
- The TPV entity delivers and manages the third party verification services.
- The Losing Provider requests the Transfer Code from the upstream provider. Each provider in turn validates the switching service type and passes the TxC request upstream until it reaches Openreach.

Openreach requests the TxC from the Hub and upon receipt passes it back down the chain to all subsequent downstream providers.

- The Hub holds a centralised system which connects to other parties' systems to support the end to end process. It includes a list of all UK fixed voice and broadband services. CPs, in their role as GPs and LPs depending on the transaction, use the Hub to confirm the service(s) to be switched. The Hub 'unlocks' records where consent is obtained and provides a mechanism to track the switch in progress.

The introduction of the entities, systems and processes needed to deliver the GPL TPV model require significant, widespread change, including governance of the design process and implementation across a large number of businesses.

## 3.1.2  The structure of TPV service provision

Having identified the new entities (a Commissioning Board and Hub and TPV service delivery entities) required for the GPL TPV, we now consider the optimal number of TPVs and service providers needed. Our analysis considers three aspects of the impact of a multiple TPV provider model:

- Impact on CP operations;
- Impact on the competitiveness of the model;
- Impact on cost and economies of scale.

We present below our analysis of each of these aspects.

### 3.1.2.1  Impact on CP operations

There is a large number of CPs that would require TPV services, with offices and locations spread around the UK, Eire and, where off-shoring is used, in locations such as India or the Philippines. Even for the largest CPs, through outsourcing, several entities may be providing sales services and thus will need to interface to TPV service delivery entities and use customer and order management solutions enabled with interconnection to the Hub.

Typically, where a contact centre is heavily reliant on a third party for the delivery of customer experience, the operational management is closely integrated with the third party's – for example daily call, regular reports and ad hoc incident management. The nature of the TPV service provider's role in customer experience means it will need to integrate with many CPs' contact centre operations.

### 3.1.2.2  Impact on the competitiveness of the model

There are a number of options for using competition in the supply of TPV services which could serve to impact cost. Below are two examples of how this could work:

- Centralised choice - The industry's Commissioning Board initially and/or subsequently the management team of the TPV/Hub entity (ServCo.) can run regular competitions and choose the best, say, one or two contact centre outsource operators to provide TPV services on behalf of ServCo. under a robust contract;
- Distributed choice - Operators could be free to choose their own *qualified* TPV provider through competition. In this model, ServCo. management will define: (1) the requirements that a TPV service provider must meet; (2) run a procurement to pre-qualify acceptable service providers; (3) select a panel of acceptable service providers; and (4) ensure services are delivered under an industry standard contract that obligates the TPV service provider to meet the needs of a centralised TPV management entity. CPs select their TPV service provider by running 'mini–competitions' among pre-qualified service providers.

*Concentration versus distribution*

Contact centre teams servicing a single flow of calls that have below c40-50 agents suffer from a "dis-economy of scale" - staff utilisation levels have to be held at low, inefficient levels in order for the contact centre to answer a high proportion of calls within the target time service. Provided the size of each separate contact centre team is in excess of 40-50 agents, economies of scale diminish. For the example structures below, the differences in minimum achievable operational costs, before central overheads, are very small

- One team of 300 - maximum economies of scale
- Two teams of 150 - less than maximum, but very small variance to optimum
- Six teams of 50 – at this number of teams there is a small, but not significant reduction in economies of scale. If team sizes fall below 50 – for example due to a higher number of separate teams – the impact of loss of economies of scale will become significant.

For this reason there is no practical, intrinsic cost difference between these options for processing calls, provided the requirement for TPV services is sufficiently large.

### 3.1.2.3 Impact on cost and economies of scale

The table below summarises our assessment of the impact of a number of structural options for the TPV and Hub functions:

- One TPV/Hub entity – Single legal entity reporting into industry governance (for example, a Commissioning Board). One management team and set of functional overheads;
- Separate TPV entity and Hub entity – Two legal entities reporting into industry governance. Two management teams and two sets of functional overheads;
- Multiple separate TPV entities and one separate Hub entity – For example, two legal entities reporting into industry governance. Multiple management teams and sets of functional overheads.

*Table 7 Our assessment of the impact of structural options for TPV providers*

| Cost element | Significance of cost elements on total costs | One TPV/Hub entity | Separate TPV entity and one Hub entity | Multiple separate TPV entities and one Hub entity |
|---|---|---|---|---|
| Central management team | Low | Single instance | Two instances, cost doubled | Multiple instances |
| Supporting functions (Internal IT, HR, Finance) | Low | Single instances | Two instances, cost increased by 75% - (shared service synergies assumed) | Multiple instances cost increased by 100% - (shared service synergies assumed) |
| Hub processing to deliver service | Medium | Single instances<br><br>Cost neutral | Single instances<br><br>Cost neutral | Single instances<br><br>Cost neutral |
| TPV functions to deliver service | High | Single instances<br><br>Cost neutral | Single instances<br><br>Cost neutral | Multiple instances, but volume reduces<br><br>Cost neutral provided each TPV has more than 50 Customer Service Advisors (CSA) at peak |
| CP-TPV data and voice interfaces | High | Driven by number of CPs | Broadly Cost neutral – similar number of interfaces | |

This analysis shows that the cost variance between the options considered is applicable only to those cost elements that have a low significance in relationship to total costs. Even though the significance is low, to be consistent with our approach of selecting a cost effective option, we have selected a 'one TPV' model for our cost assessment.

A separate analysis based on current volumes indicates: (1) a TPV system size of around 110-140 positions; and (2) in consequence, that if there are more than two TPV providers, each will be subscale through loss of queuing-driven economies of scale.

In the interest of assessing the most realistic, minimum cost for the GPL TPV model we propose to cost a 'one TPV/Hub' entity structure as part of our core design.

### 3.1.3 Separation of Hub and TPV service delivery

We have considered three options for how the Hub and TPV services will be delivered and managed within the GPL TPV model:

- Option 1: The Hub and TPV providers are separate entities; and
- Option 2: A single ServCo. delivers both Hub and TPV services.

These are described further below.

#### 3.1.3.1 Option 1: Hub services and TPV services delivered by separate entities

Under this option, the Hub is operated and managed by an independent organisation, providing access services to the TPV provider. This option requires separate management layers for both the TPV provider and the Hub.

*Figure 3-5 Option 1: Implications of having Hub service and TPV services delivered by separate entities*
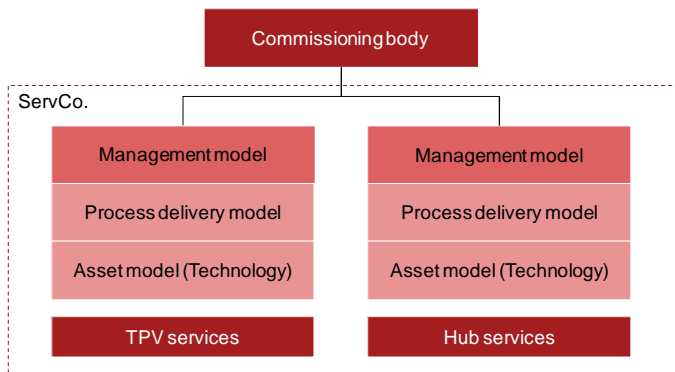


*Source: PwC*

*Management model:* An additional management layer is required in relation to the new Hub organisation which largely duplicates that of the TPV provider.

*Asset model:* Hub technology is provided by an outsourced provider. The contract for this is managed by the Hub management.

*Process delivery model:* Hub operations are run by the Hub organisation.

#### 3.1.3.2 Option 2: One entity (ServCo.) delivers both TPV and Hub services

Here the Hub is owned and managed by the ServCo. The management layer of the ServCo includes 1 additional FTE to manage the relationship with the outsourced technology provider. This model discounts the possibility of multiple TPV entities – although the ServCo management team could choose to co-source TPV services from multiple suppliers, if there was an economic and operational case so to do.

*Figure 3-6 Option 2: Implications of ServCo. delivering both TPV and Hub services*
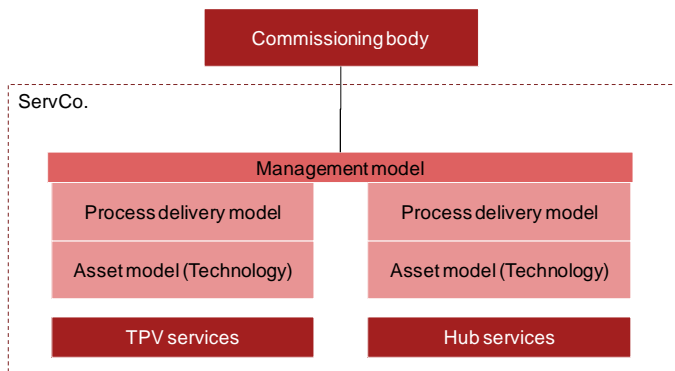


*Source: PwC*

*Management model:* The management of the Hub represents only a small incremental cost to the TPV provider with the additional cost of one FTE to manage the outsourced technology. This option removes the duplication of management layers present in Option 1.

*Asset model:* Hub technology is provided by an outsourced provider.

*Process delivery model:* Hub operations are managed and delivered by the ServCo.

Our approach is to select the most cost-efficient option in developing our assessment. Our analysis shows that Option 2 is the least costly, as it provides a cost-avoidance opportunity by disposing of the need to create a management layer and other overhead costs which are typically associated with the setting up of a standalone business.

Economies of scope and the impact of multiple instances of overhead cost indicate a single TPV/Hub entity is likely to be the most economic solution. Therefore we have costed a solution where TPV and Hub services are delivered from the same entity and supervised by a single management team.

## 3.1.4 Impact on industry

The impact on the industry requires an assessment of the current situation and its complexity. The diagram below summarises the various methods that can be used to support from a systems perspective, a customer switch. There are a number of options:

- A smaller CP uses a wholesale provider's "Partner Relationship Management" system – normally a portal that allows services to be ordered;
- A smaller CP uses a Third Party Integrator's system, where the third party has developed a solution that can support multiple CPs on a shared service basis. Note in this area there are two forms of engagement between CPs and other industry solutions: (1) Provision of application services to CP clients on a bureau basis for CPs; and (2) Provision of outsourced telemarketing services, where the outsource supplier has its campaign systems integrated to use either the wholesale service providers PRM or customer management systems. *Note, this has an essential role in containing the complexity and cost of the GPL TPV model.* Without it, the delivery programme would need to manage change through over 300 projects in CPs
- Larger CPs, dependent on volume, can use their own systems, which integrate to other elements in the industry's system architecture

*Figure 3-7 Relationship between CPs and the options for systems that they have for selling and processing switches*
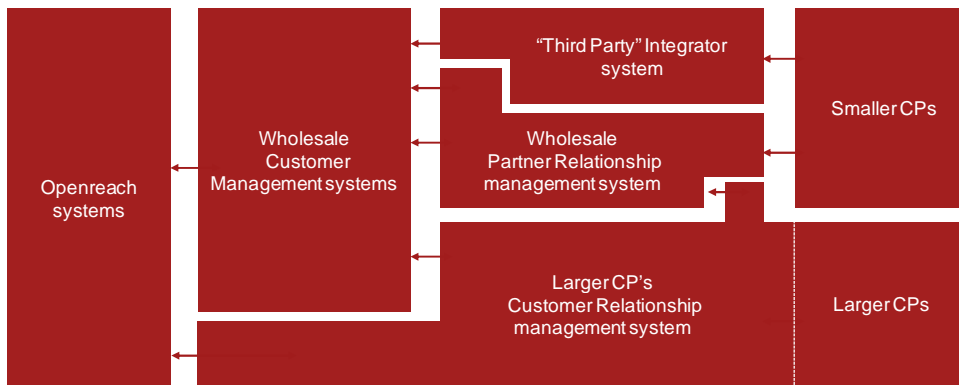


*Source: PwC*

Design of the GPL TPV detail requires consideration of the impacts to a CP's processes and systems, both in their role as GP or LP. The roles of GP and LP are documented in the SWG use cases. Implementing the GPL TPV model will result in some significant areas of change, the introduction of new business processes and provision of customer management systems integrated into the industry system. Key areas of change will be around:

- Customer and Service Management processes;
- Management of change, as CPs change their suppliers of outsourced telemarketing and door-to-door sales campaigns;
- New processes to manage the B2B interfaces and relationships between the Communications Providers, Wholesalers and ServCo, and its TPV and Hub service delivery functions.

Changes will be required to introduce Hub queries into Customer Self Service and Customer Sales Representative processes. Consideration will also be needed to introduce the concept of asynchronous switch verification into the order process. Minor changes will be expected to Sales Management and Knowledge Management processes.

Similarly it is expected that Wholesale Operators and Openreach themselves will be impacted by the proposed GPL TPV model. These operators may not experience the same level of customer and service management changes, however, they will need significant technology changes to create new interfaces to Hub Services.

In our independent assessment of the industry we also identified the core roles played by Third Party Integrators (TPIs). TPIs may offer business bureau services such as Customer Relationship Management (CRM) and billing functions either as a service or white label to CPs. Some TPIs have also created their own platform to provide the interface direct with Equivalence Management Platform (EMP) and WLR3. This drove a classification of two tiers of TPI:

- *Full TPI* - TPIs providing both CRM and Billing Bureau Services and a WLR3 platform interface;
- *BS TPI* - TPIs providing CRM and Billing Bureau Services only.

Under the GPL TPV model, TPIs will also need to provide updated services. BS TPIs will need to review and revise the applications they provide to CPs. It is expected that changes will be required to customer and service management functions in particular. In the case of Full TPIs a new interface to ServCo. Hub Services will be required alongside updates to customer and service management application services.

## 3.2 *What services will be provided within the GPL TPV model and at what level?*

Following definition of the GPL TPV model and identification of the entities required we sought to identify the service definition and individual service components that the TPV provider and the Hub will be committed to deliver against. These cover the following core service elements: a validation mechanism; consent recording and reporting mechanism; a customer information database; a service provisioning information database; and a progress tracking mechanism. These service components are detailed in table 3-3 below.

We provide below our service definition for the TPV provider and the Hub, which forms the basis for our cost assessment.

*The GPL TPV model will provide authentication and consent validation services as part of a single standardised switching process for fixed telephony and broadband services in the UK over the Openreach copper network.*

This service definition is intended to clearly specify the range and scope of services for which the ServCo. will operate and sets the limits for defining the TPV service architecture. It is important to note that the TPV service architecture can be defined in a way that allows adaption for a broader range of services in the future. However, we did not examine the potential range of future services, and therefore the suitability of the architecture for all potential services cannot be assured.

### 3.2.1 *GPL TPV model service components*

ServCo. will provide a service to consumers and small businesses confirming and validating their intent to switch Communications Providers. To facilitate an efficient and authenticated switching process, ServCo. will provide a Consumer Information Database containing a record of all consumer services provided on a fixed line, the technology used to provision these services, and a method for CPs to track progress during the switching process.

*Table 8 GPL TPV model service components*

| Service component | Services |
|---|---|
| Validation mechanism | **TPV**<br><br>A telephone call centre to accept incoming verification calls transferred from GPs<br><br>A web portal interface to accept online transfer verifications from GPs<br><br>Capacity to meet service levels during periods of peak demand<br><br>Adequate quality of service in handling consumer calls, with average call duration of five minutes and no more than 30 seconds waiting time for transferred calls from GPs<br><br>Achievement of process adherence and customer experience performance indicators<br><br>Flexibility to scale to meet industry demand such as large scale promotions<br><br>Change management to adjust to structural changes of operators or Ofcom<br><br>Call centre services available 24 hours a day, seven days a week to mirror the operating times of communications providers<br><br>Web portal services available 24 hours a day, seven days a week<br><br>Access to validation records provided within one second (this may be online as the end user is possibly on the phone to a CP demanding an answer) for records up to four months old (to cover quarterly billing), and two hours for older records.<br><br>**Hub**<br><br>Cancellation service via both call centre and web portal interfaces for consumers wishing to cancel their switching request |

| Service component | Services |
|---|---|
| | Availability target to match availability of CPs own sales systems (with appropriate disaster recovery and business continuity plans to meet availability target) |
| Consent recording and reporting mechanism | **TPV**<br><br>Retain records of consumer consent validations for six months<br><br>Access to stored records will be provided to CPs or Ofcom within 24 hours of request<br><br>Report validation and provisioning statistics to Ofcom and CPs<br><br>Bill CPs based on usage of the TPV services |
| Consumer information database | **Hub**<br><br>A single repository of all services provided over fixed lines on the Openreach copper network (retail level information only)<br><br>A web portal interface to accept synchronous manually entered queries and record updates<br><br>An email interface to accept asynchronous batch queries and updates<br><br>A web Enterprise Interface (EI) to accept automatic synchronous and asynchronous batch queries and batch updates direct from CP systems<br><br>Performance to meet service levels during periods of peak demand<br><br>Flexibility to scale to meet industry demand such as large scale promotions<br><br>Change management to adjust to service type, CP and service entry, exit and change<br><br>Service availability 24 hours a day, seven days a week for web portal, web EI and email interfaces<br><br>An email interface to accept asynchronous batch queries and updates |
| Service provisioning information database | **Hub**<br><br>A repository linking consumer services to the wholesale service provider technologies and access technologies used to provide service<br><br>Confirmation of asset updates during the switching process<br><br>Identify the correct switching mechanism for a transfer |
| Progress tracking mechanism | **Hub**<br><br>A method to unlock a consumer service for transfer once TPV verification has been completed<br><br>A method to update an unlocked service record to detail which phase of the switching process is in progress<br><br>A method to identify the GP associated with a transferring service<br><br>Provision of a transfer code to link service being transferred to Customer, GP, LP, WCP and AO |

TPV services will largely rely on human resource for delivery whereas the Hub will largely rely on automated service delivery from a centralised database and applications, with interfaces to CP systems and networks, supported by an IT organisation.

It should be noted that, due to the high degree of variation between CP business models, it is likely that CPs will require differentiated levels of service. We believe this will inevitably lead to the creation of a range of service levels tailored to segments of CPs. There will be some cost impact for these differentiated service variants. We have, however, not estimated these cost impacts and have based our cost assessment on a single service level that meets the minimum standards required by CPs, and which complies with the Ofcom/SWG specifications for the GPL TPV model.

## 3.3 What processes will the entities in the GPL TPV model execute to provide these services?

In the previous section (*What services will be provided within the GPL TPV model and at what level?*) we have articulated the service definition and service components that the TPV provider and the Hub will be committed to deliver against. In this section, consider the processes required to deliver these services:

1. We derive a high-level view of the end to end processes that will support TPV and Hub service delivery; and
2. We refer to TM Forum frameworks for business processes (eTOM) to develop an exhaustive view of the sub-processes involved.

Creating a process delivery model for the GPL TPV model ensures that all the aspects of ServCo. can be comprehensively captured, and therefore an accurate operating model developed to deliver a complete view of the costs of the organisation.

In defining which processes are required to deliver adequate services under the GPL TPV model, we derive Process Delivery Model definitions, which specify what operational activities are executed where, and by whom, within the model.

The activities, defined within the Process Delivery Model, outline the day-to-day interactions which the TPV provider, and the Hub, have with their customers, employees and suppliers. This also includes activities that are performed by third parties, for example where the processing of transactions has been outsourced. We provide below a diagram of the Process Delivery Model we have developed to enable the ServCo to operate effectively.

*Figure 3-8 ServCo. business processes*
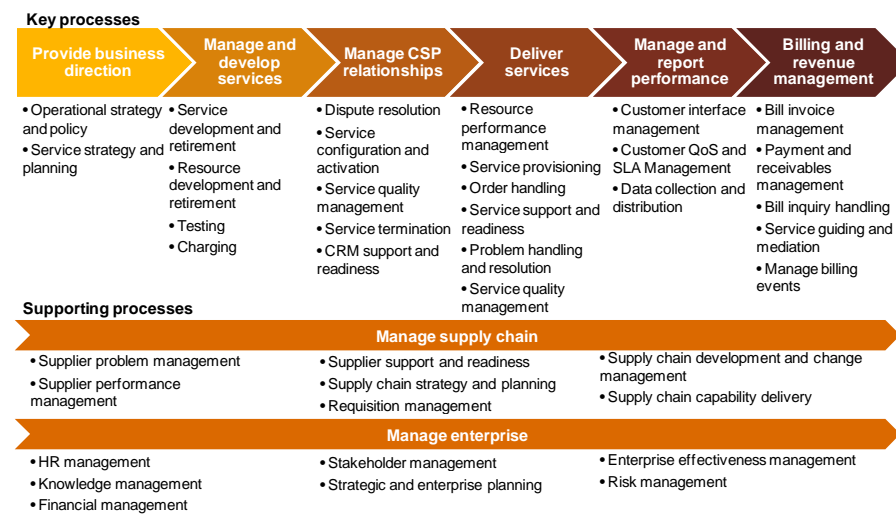


*Source: PwC*

The process model was developed with reference to the TM Forum Business Process Model (eTOM). The eTOM provides a comprehensive, industry-agreed, view of the key business processes a service provider requires to run its business. We consulted the eTOM as a method to ensure that commonality across process definitions could be adopted where possible. However, ServCo. is not a telecommunications provider so, while eTOM processes have been used at the process level to deliver commonality across the entire value-chain of partners, the higher level key process domains have been created using ServCo. specific titles. ServCo. executes specific, narrow tasks in the end to end industry processes. It needs its own business processes to ensure it delivers the services required and the service level required, and can take direction from its governing Board and owners. A brief description of these processes, and the reasons for their inclusion, is set out below:

- *Provide Business Direction* – Any organisation needs strategy and business direction. Here, many of the strategic elements will be prescribed by Ofcom, CPs and future trends in the industry. We nonetheless

consider this function to be critical, to ensure that processes exist within ServCo. to capture, for example, shifts in market and industry structure, and so allow for service planning;

- *Manage and Develop Services* – When change occurs either through organic growth or via change requests from Ofcom, this may prompt existing TPV services or resources to be modified, enhanced or, potentially, retired. This ensures that ServCo. has processes which can deliver these services, and reflect these changes in its charging models;
- *Manage CP Relationships* – Contains all of the processes which, in a traditional CP, form part of the customer management domain. This area has been introduced to ensure that ServCo. has a mechanism to manage their customers (that is CPs,) perform activation and termination for new entrants or retiring CPs, and ensures there are processes which can handle problem, dispute and quality issues throughout the CP relationship;
- *Deliver Services* – Provides all the processes required to actually perform the services identified in the SWG use cases. This may be processing TPV validations through an order handling process, problem handling and resolution of any validation or Hub issues and ensuring all services and resources are provisioned and available. Without these processes it is not possible for ServCo. to function as prescribed by Ofcom;
- *Manage and Report Performance* – These processes ensure that ServCo. has a mechanism to gather and report performance statistics to Ofcom so that the success of the GPL TPV model and ServCo. can be measured;
- *Billing and Revenue Management* – This area contains all the processes required within ServCo. to handle charge-back to CPs based on usage of the TPV service;
- *Manage Enterprise* – This process area is a duplicate from the eTOM as it includes basic business processes required to run any business. These processes have interfaces with almost every other process in the enterprise, whether operational, product or infrastructure processes. They are included to ensure that ServCo. can function as a business in its own right;
- *Manage Supply Chain* – This domain supports the core operational processes of ServCo. where any interaction with external parties is required. The inclusion of distinct Supply Chain Management processes ensures ServCo. has a direct interface across end to end operations with suppliers. This is of particular importance since ServCo. differentiates itself from traditional communications providers as a consequence of the fact that CPs are potentially both customer and supplier in the value chain.

These eight high level business processes will ensure ServCo. delivers services to the requirements of consumers, industry and the regulator.

## 3.4 What organisations are required and how big do they need to be?

In this section, we perform an analysis that aims to understand what sort of organisation ServCo. needs to be in order to deliver the essential processes identified earlier in this report. By using PwC's TOM framework, we have identified the discrete components that form ServCo.'s operating models. The remainder of this section provides a detailed description of three key components of ServCo.'s operating model, namely its:

- Operating structures, including the management model and asset model;
- Interactions, in the form of the commercial and funding models; and
- Infrastructures, which are broken down into the following areas in the PwC TOM framework:

    1. Organisation design and performance management;
    2. Capability and behaviours;
    3. Property, facilities and locations;
    4. Tax and legal structure;
    5. Information and technology infrastructures; and
    6. Process architecture.

### 3.4.1 Operating structures

In this section we analyse the options for operating structures within the context of the GPL TPV model in order to determine which one to use within our cost evaluation. Where it is not possible to assume cost neutrality amongst alternative options we provide a rationale for our selection.

#### 3.4.1.1 Management model

CPs will delegate decision-making authority to the Commissioning Board who will be responsible for key design and management decisions.

The Commissioning Board will provide governance and delegate day-to-day decision making authority to a lean, expert management team responsible for the delivery of Hub and TPV services, reporting to the Commissioning Board.

#### 3.4.1.2 Commissioning Board

The Commissioning Board is an industry controlled and funded body, responsible for setting up the GPL TPV model and providing on-going oversight thereafter.

Membership will comprise of eight to twelve elected representatives from registered CPs who will commit one to two working days per month to undertake Commissioning Board activities. Representatives will be senior members of CP staff.

The board will play a leadership and supervisory role, responsible for making key decisions and monitoring performance. The Commissioning Board will require additional support during the set-up phase, which is explored further in *section 3.5*.

#### 3.4.1.3 Entity management

To operate effectively, ServCo. will require a small management team to manage the day-to-day running of the business, be accountable for delivering services at the required service levels and, when required, make decisions on organisational changes and investments to reflect the changing needs of the GPL TPV model.

There are various options for management accountability that can be considered within the GPL TPV model. However, from a cost perspective, we considered these options to be cost neutral, as typically a similar level of management effort and time is required reporting business and financial performance to stakeholders.

#### 3.4.1.4 Asset model

Within the Asset model, we expect ServCo. to have:

- *People* (management and staff) – a small number of staff need to be employed to effectively run the organisation; we provide a more detailed description of how the business is organised and what roles we consider as required in *section 3.4.3.1.1* below;
- *Fixed assets* (owned or leased) – we consider ServCo. to have very limited asset ownership, as it is more cost effective to rent or lease most of the assets required for the daily business needs. However, we assume that the server and software assets are owned by ServCo. in order to comply with data protection requirements;
- *Customer relationships* – ServCo. is responsible for managing relationships with CPs to ensure an effective switching process To this extent, we expect ServCo. to provide day-to-day account management services to CPs to ensure effective problem resolution, accurate billing and revenue assurance and proper operational management to cope with demand;
- *Supplier relationships* – ServCo. controls the provision and management of call centre services through contractual arrangements with an outsourced supplier;

The lowest cost option for ServCo. is one where only intellectual property and a small number of assets are directly owned, with heavy leverage of the assets of outsourced service providers (for example ICT and accommodation). This finding is based on the conclusion that the scale and scope of the Hub and TPV service delivery operations are not likely to benefit from the economies of scale and scope that are enjoyed by large IT and contact centre operations.

The Hub needs premises which have: (1) excellent network communications to CPs, TPIs, Wholesale providers and locations from which TPV services are delivered: and (2) specialised environments for housing ICT (air conditioning, uninterruptible power suppliers), operational management and security 24x7. There is a market of service providers that enjoy significant economies of scale and scope, for example, spreading these fixed cost overheads across many pieces of customer ICT. It is highly unlikely that a start up operation could recreate these cost structures, and the quickest, most pragmatic, most cost efficient option is to source these requirements from a specialist hosting outsourcer. Note we assume that ownership of ICT infrastructure, versus leasing it, is cost neutral on a net present cost basis.

Cost effective TPV service provision requires: (1) excellent voice and data communications; (2) specialised Voice ICT; (3) specialised contact centre personnel, for example forecasting and scheduling; (4) a specialised value chain to provide suitable staff; and(5) operations with a strong focus on unit costs. In our experience, public sector contact centre call centre operations suffer from significant cost issues, some driven by employee terms and conditions, others by difficulty in applying best practice. For example, relative to an outsourced operation, public sector staff have shorter hours per day, longer holidays, higher pension costs, lower utilisation and higher absenteeism.

An outsourced solution offers several benefits:

- Access to pre-existing facilities without the capital expenditure to provision a building with specialist Voice ICT;
- Ability to leverage economies of scale;
- Access to skilled operational management that a smaller operation cannot afford;
- Access to outsourcer intellectual performance in driving performance; and
- A pool of staff on industry standard terms and conditions.

### 3.4.1.4.1  Sourcing model

Within the sourcing model, and based on the ownership model we have identified for the Hub outlined in *section 3.1.2* (*One of many TPV providers?*) we have identified three different elements of the organisation, each with different sourcing requirements:

- *The technology Hub* – containing the consumer information and service provision tracking databases;
- *The TPV Call Centre* – containing the people and technology required to handle the transfer and validation of verification calls;
- *The TPV Organisation* – which considers the sourcing for the technology and facilities required by the TPV Organisation itself.

In summary, we find the following to represent the most effective options (see *Appendix E* for sourcing matrix):

- *ServCo* – Cloud-sourced IT services and a HR and finance function offer the most cost effective option, together with an onshore office facility;
- *Hub* – An outsourced manages services is the most likely option for the Hub due to issues around personal data ownership; and
- *Call centre* – An outsourced fully managed call centre service is the most effective option in light of the level of hardware investment required for in-house services.

## 3.4.2 Interactions

### 3.4.2.1  Commercial model

In principle, we expect ServCo. to recover its costs and make no profit from its operations. Costs will be recovered through a fee charged to CPs on a usage basis as described in the following section. The level of charges will be set to recover costs.

### 3.4.2.2  Funding model

In the previous section, we have introduced the concept that ServCo. will charge CPs for customer switching on a usage basis (price-per-customer validated). Although this model requires some investment in terms of deploying and managing billing capabilities, we expect it to be more efficient than other charging model

options, (such as taxation, fixed annual/monthly fee for CPs, tiered annual/monthly fee for CPs), as prices better reflect the costs of supplying services. In general, charging models that do not reflect the underlying costs of service are likely to result in market distortion and inefficient resource allocation.

Whilst charging on a usage basis will cover on-going costs, capital investment requirements will be met by a mutual funding model where CPs each pay an initial membership fee which will be used to provide the seed capital and provide additional capital when required.

## 3.4.3 Infrastructure
In this section we detail the infrastructure requirements for ServCo.'s operating model.

### 3.4.3.1 Organisation design and performance management
#### 3.4.3.1.1 Organisation design
As discussed in section 3.1, we expect TPV and Hub services to be managed by a standalone independent organisation (ServCo.) for which we provide the organisation chart below.

##### 3.4.3.1.1.1 ServCo.
ServCo. delivery will be based on an outsourced model, dimensioned as follows:

- Auxiliary end user services outsourced to UK based provider;
- HR and legal services mostly outsourced;
- Hub network connectivity, hosting provided by outsourced supplier;
- TPV service delivery provided by outsourced contact centre; and
- Serviced office facilities.

The retained HR function manages recruitment and on-boarding as well as providing support to the business in terms of succession planning, performance management, etc. The retained function will also manage services provided by the outsourced supplier.

*Figure 3-9 ServCo. organisation for delivery of Hub and TPV services*
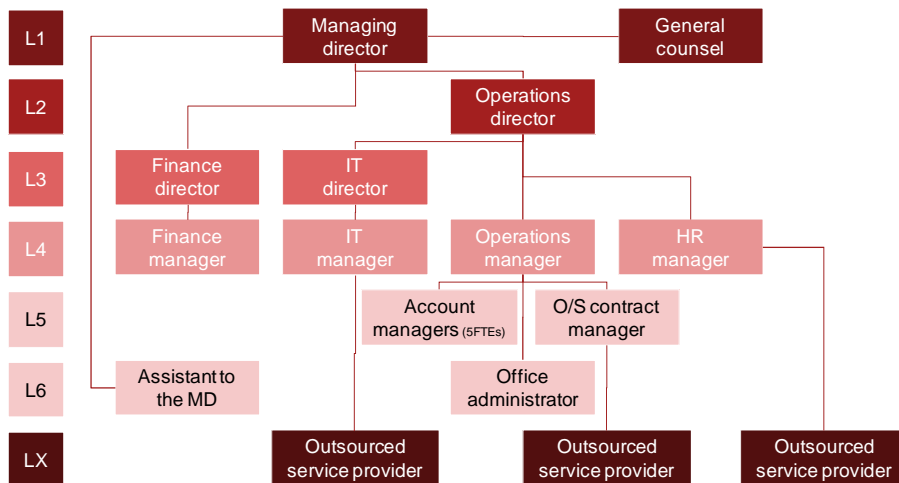


Source: PwC

We identify, as a minimum requirement, 14 key positions which need to be filled. In addition, we estimate that two support staff will be needed. The roles and responsibilities are detailed in the table below.

*Table 9 TPV provider roles and responsibilities*

| Function | Role | FTE(s) | Responsibilities |
|---|---|---|---|
| **Key positions** | | | |
| Strategy | Managing director | 1 | Strategy and business planning |
| | | | Reporting |
| Operations | Operations director | 1 | In charge of service operations including IT |
| | Operations manager | 1 | Management of Outsourced contact centre contract manager and Account Managers |
| | Contact centre contract manager | 1 | Accountable to the Director of operations for the successful management of the contact centre contracts |
| | | | Responsible for forecasting of volumetrics and delivering the required service levels |
| | HR manager | 1 | Legal and operations |
| | | | Recruitment and on-boarding of new staff |
| | | | Manage HR outsourcing provider |
| | Account managers | 4-7 | CP relationship management |
| Finance | Finance director | 1 | Responsible for finance department executive management |
| | | | Developing long term strategic financial planning and business investment |
| | | | Oversee and approve finance, accounting and reporting |
| | | | Oversee appropriate internal controls |
| | Finance manager | 1 | Perform compliance and control and business insight processes |
| | | | Perform the day to day transactional processes |
| | | | Accounts payable/accounts receivable transactions, customer billing |
| IT | IT director | 1 | Manage the IT strategy development, plans, processes, policies and projects |
| | IT manager | 1 | Manage relationship with IT suppliers |
| **Support** | | | |
| | Office administrator | 1 | Administrative and support duties |
| | Secretary to the Managing director | 1 | Secretarial and administrative duties |

### 3.4.3.1.1.2   Hub Services

In our design, Hub services are provided from Applications and ICT that is provided from an outsourced managed service. This is the most cost effective option that deals with personal data ownership issues.

### *3.4.3.1.1.3 TPV Services*

TPV services are delivered by at least one fully managed outsourced provider. Our view is that this is likely to be the most cost effective option, from both Operational and Capital Expenditure perspectives, and is based on our experience in assessing private and public sector call centres against the performance of outsourced operators.

### 3.4.3.1.2 Performance management

Based on our experience of performance measurement frameworks and on the set principles of good performance applicable to a TPV provider, we expect an appropriate performance of ServCo. to cover three key elements:

- Performance of ServCo;
- Performance of outsourced service delivery for TPV services; and
- Performance of outsourced service delivery for Hub services

ServCo. performance ,and that of its management team, will be measured against a balanced scorecard of:

- Financial performance for example performance against budget;
- Service quality;
- CP satisfaction;
- Consumer satisfaction; and
- Delivery of strategic objectives;

Outsourced service delivery for TPV services will be measured by assessment against a balanced set of KPIs, linked to revenue-at-risk to performance.

- The number of customer switching calls successfully completed within specified call waiting times:

    – We expect performance of this metric to be measured at the call centre and the cost to be included in the contractual arrangements with the outsourcer;

- The number of complaints received (both from CPs and from the switching customers), with mandatory complaints handling procedures in place:

    – We expect the number of complaints to be relatively small and to be manually handled on a weekly basis; we therefore assume the cost of complaint management to be relatively small;

- Quality and speed of query resolution (for queries from CPs, Ofcom and the public):

    – Similarly, in the case of query resolution, we expect the number of queries to be relatively small and to be manually handled on a weekly basis; we therefore assume the cost of query resolution to be relatively small;

- Achievement of a Customer Satisfaction or NPS -style customer experience metric; and

- Financial performance against budget

Outsourced service delivery for Hub services will also be measured by assessment against a balanced set of KPIs, linked to revenue-at-risk to performance:

- Availability of the service to CPs/downtime;
- Response times to users of the system;
- Response time for fault resolution; and
- Financial performance against budget

There are a number of options for measuring and managing performance - hourly, daily, weekly, monthly, quarterly and annually. From a cost perspective, we expect the different options for measuring the performance

of ServCo to be relatively cost neutral, with cost variations being small and mostly driven by the number and frequency of the metrics being measured, and of the complexity of the solution employed to measure them.

For both Hub and TPV services there will be significant, automatic production of management information for measuring performance, so cost is relatively insensitive to frequency.

#### 3.4.3.1.3 Reporting requirements

We expect that a number of regulatory reporting requirements will be imposed on the TPV provider to submit data relating to:

- The number of calls referred to the TPV provider by the GP's;
- The number of successful and unsuccessful TPV verifications;
- The number of customer cancels (with the reasons);
- Data regarding the use of cancel own[4],[5], and
- The number of successful and unsuccessful queries against the Hub database.

Our cost assessment includes these requirements in the specification of the systems and processes required to comply with regulatory reporting requirements as set out above. We do not have, at this stage, any further information on the reporting requirements that could be imposed upon the TPV provider or the Hub in the future.

### 3.4.3.2 Capability and behaviours

Behaviours are the ways of working expected to be demonstrated by people in the organisation. This will be used to identify people processes including recruitment, development, performance management and talent management.

This section provides the definition of the future capabilities that the staff will need in order to perform their roles in the new organisation, and will be used to help to identify manpower requirements and associated recruitment plans.

It should be noted that this section is focused on ServCo, not any component outsourced functions. For example TPV services will be delivered by a contact centre outsource provider, which will have different characteristics to ServCo, for example on attrition.

#### 3.4.3.2.1 Training

Due to the role that ServCo. will play within the switching process, we envisage that all workers involved in processing personal information about switching individuals must have an appropriate understanding of the Data Protection Act 1998. In addition, we assume that some staff members, with more specialist data handling roles, specifically computer security and database management personnel, receive extra training to cover data protection rules relevant to their jobs.

Aside from the above, we expect ServCo. to have standard training needs typically associated with small enterprises. Mostly, we expect training to be performed on-the-job. We account, however, for a limited off-the-job training budget to account for professional development and regular (annual) vocational training, depending on the specific requirements of the role. We assume that off-the-job training will be delivered by outsourced specialists for a total cost of £1,750 per employee per annum (including Data Protection training).

#### 3.4.3.2.2 Recruitment

During the setting up of the ServCo, we expect recruitment activity to be substantial as the right individuals need to be identified and selected. During the normal running of the business, however, we expect recruitment efforts to be relatively small, assuming average attrition levels, and considering the small size of the organisation.

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[4] Whilst GPs will manage failed verifications, the TPV provider will have its own cancel facility.

[5] From minutes from Switching Working Group 6 and Offline Workshop Meeting 12 - 12th May 2011

Recruitment can be in-house or outsourced. We expect ServCo. to outsource its recruitment, considering that:

- Recruitment efforts will be minimal during the lifetime of the organisation for the reasons provided above;
- There are no plans for the organisation to experience a significant expansion in operations that could consequently create an economic case for building an in-house recruitment team;
- The nature of the TPV business does not require any technical recruitment that would make it preferable to retain specialist in-house recruitment skills; and
- This is typically the most cost effective option.

#### 3.4.3.2.3  Performance management

We consider a structured process for managing employee performance an essential enabling factor for ServCo. to effectively fulfil its business remit. We expect employees' performance against objectives to be reviewed bi-annually in individual meetings with the HR manager. ServCo. will have in place a reward scheme funded from operations.

### 3.4.3.3  Property, facilities and locations

This section details the structure and configuration of offices, equipment and other physical (non IT) infrastructure assets required by ServCo. to operate.

#### 3.4.3.3.1  Offices

ServCo. has the option to own or rent the premises where it operates and these can be located anywhere in the UK and Eire.

The key role ServCo plays in delivering customer experience and ensuring the regulator's objectives for the switching processes means that regular liaison will be required between ServCo., CPs, WO, AO and Ofcom. Typically this means scope for regular meeting and site visits and indicates a business requirement for reasonable operational proximity between ServCo and the entities for which it will deliver services. For this reason, we have short listed locations that are within reasonable travel distance of key CPs and Ofcom, aiming to avoid locations that require air travel.

Regarding ServCo.'s TPV operations, we have concluded that these need to be based in the UK, based on the following options assessment for offshore locations:

- European operations had increased telecoms costs, similar underlying costs to cheaper regions in the UK and language and accent risks to manage;
- Locations such as India, Philippines and near Eastern operations were also considered; these were assessed as too risky to include in a base case design, due to the complicated nature of transferring customers with data to the TPV (whisper or CTI), the acceptability of the customer experience (accent etc) and concerns over allowing access and storage of customer data outside of the European Union.

Given its small requirement in term of office space, it is cost effective for ServCo. to operate from a single location (as opposed to multiple-office sites). We therefore expect ServCo. to be located in a relatively inexpensive location in the UK, since this provides significant cost advantage in terms of payroll and office space costs. Furthermore, for similar reasons, we expect ServCo. to rent serviced accommodation, rather than own its premises.

#### 3.4.3.3.2  Equipment and other physical (non IT) assets

We assume that ServCo. will obtain access to these assets on the most cost and capital efficient basis. In general this will be achieved through use of serviced office premises, which avoids adding work to the office management role.

### 3.4.3.4  Tax and legal structure

As discussed in *section 3.4.2.2.* (*Funding model*), ServCo. will not generate a profit from its operations and therefore will not be susceptible to corporate tax. Concerning ServCo.'s legal structure, we consider alternative options in this area to be cost neutral and therefore have excluded them from our analysis.

### 3.4.3.5 Information and Technology infrastructure

The TPV GPL service definition (section 3.2.1) identifies five core services required in the GPL TPV model:

- Validation mechanism;
- Consent recording mechanism;
- Consumer information database;
- Service provisioning information database; and
- Progress tracking mechanism

Each of these services relies heavily on Information and Technology architecture and processes, which has a considerable influence on cost. Drawing on the business process model created for ServCo. we have designed an initial functional architecture. Function areas have been mapped to applicable TM Forum TAM functions to ensure a consistent exhaustive approach to identify the functions required by the organisation.

*Figure 3-10 ServCo. functional architecture*
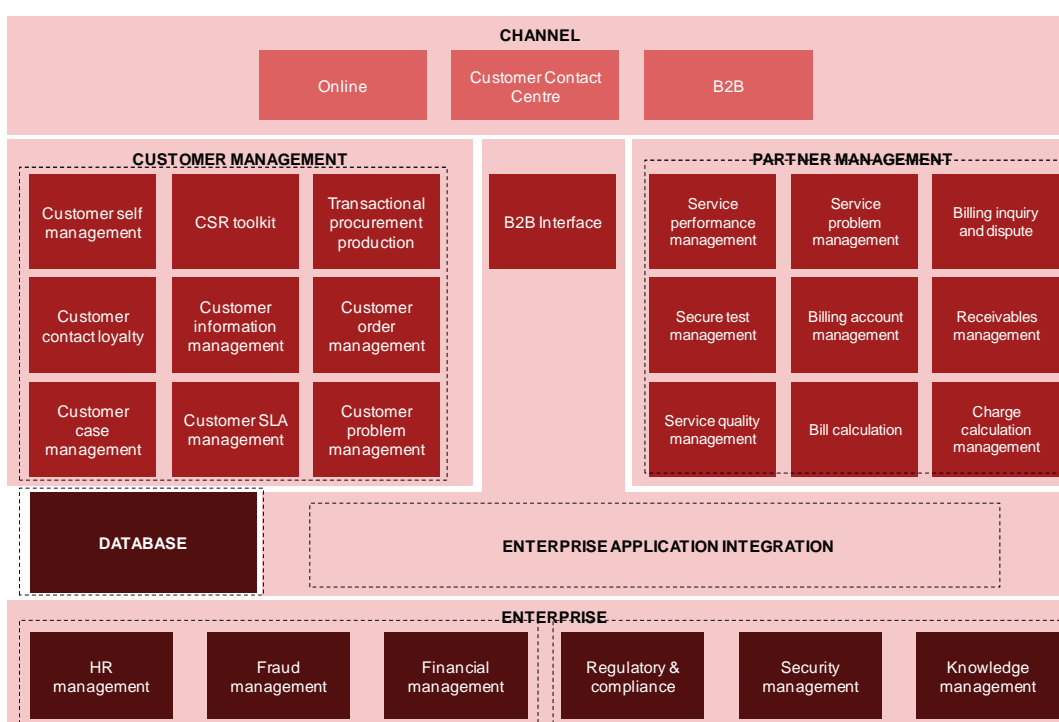


*Source: PwC*

The figure above shows the key functional domains associated with the GPL TPV model. The domains highlighted provide:

- *Customer Management* – Contains all the functions associated with providing TPV verification services. This includes online portals, call centre technologies, SLA monitoring and problem resolution functions;
- *Partner Management* – Contains all the functions associated with managing external relationships. Primarily these functions include performance, problem, quality and billing management of CPs. These functions are also responsible for managing any third party supplier relationships, particularly managing data management relationships between CPs and the Hub;
- *Enterprise Application Integration* – This function orchestrates the flow of messages within the organisation. It allows applications to send or receive messages to or from other components, and to send or receive notifications;
- *Enterprise* – Contains the functions required to maintain the organisation. These closely map to the functions required by any enterprise such as HR, Finance, Security and Compliance.

The core domains identified in the functional view have been used to identify candidate application architecture for ServCo. This mapping is shown in the next figure.

*Figure 3-11 Target Application Mapping Diagram*
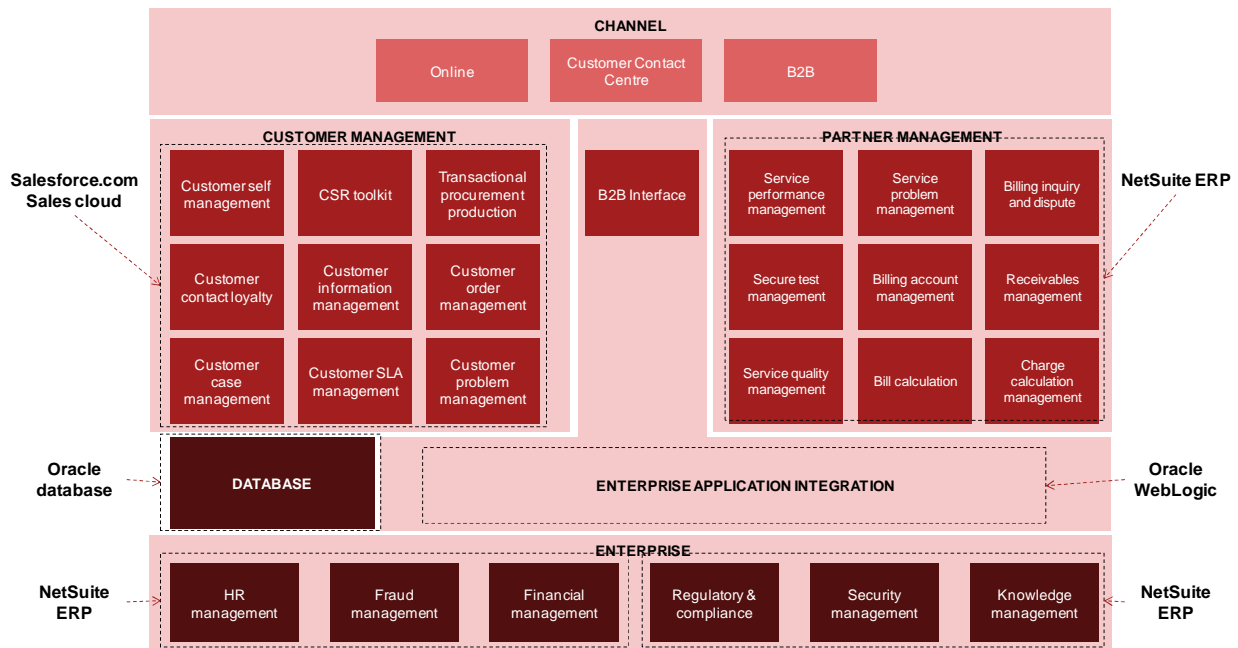


*Source: PwC*

### 3.4.3.5.1  Customer Relationship and Partner Management

Considering the functions identified, we believe a single CRM solution can be chosen to provide customer management services. Following the design principle to deliver a cost effective solution we have based our costs on a cloud-based CRM application from UK Salesforce.com based on the Sales Cloud product. This full-featured end to end CRM and Sales management product offers:

- Accounts & contacts;
- Task & event tracking;
- Customisable reports; and
- Workflow & approval automation;

This solution will provide web portals for both Hub and TPV services and will deliver the customer and case management system needed by call centre staff. Management and reporting functions are offered via enterprise analytics functions within the Salesforce.com suite. Interfacing to the Hub will be handled by web services API. These services are charged on a per user per month basis allowing ServCo. to have a variable cost structure as demand increases or declines, and are inclusive of on-going support and training materials.

### 3.4.3.5.2  Enterprise Application Integration

To provide a business logic function to translate and manipulate service records, interconnect CRM and CPs, a robust Enterprise Application Integration (EAI) application is required. A number of products can provide this functionality but from a cost perspective these are comparable. Our costing has been based on Oracle Weblogic as there may be opportunities to leverage larger licensing discounts with a single middleware and database provider.

### 3.4.3.5.3  Information Database

Due to size, Data Protection Act considerations, and CP security, we have chosen a traditionally hosted approach to provide the database functionality required by ServCo. Although many products can provide a suitable relational database, their costs are all of a similar order of magnitude. For the purposes of costing we

have used Oracle Enterprise Edition, which offers a common technology platform across Hub applications which may offer some licensing and support benefits.

### 3.4.3.5.4 Enterprise Resource Planning

Although performing a critical industry function, ServCo. can be considered a small-to-medium enterprise(SME) in terms of size and complexity. Adopting a full in-house ERP application suite would be excessive and would considerably increase costs. To provide enterprise management functions to GPL TPV model we have based our costs on a cloud solution using NetSuite ERP. This allows per user per month pricing, which reduces capital costs and provides scalable growth as required.

This solution will also provide the billing function allowing ServCo. to charge-back costs on a per transaction basis to CPs.

### 3.4.3.5.5 Information Management

To provide a common approach to Regulatory, Compliance, Security and Knowledge Management we have included costs for provision of an Intranet and Extranet portal. Costs have been based on Microsoft Sharepoint Online cloud deployment, part of the Microsoft Office 365 suite. This reduces capital investment and provides a variable cost structure allowing variable capacity on demand.

### 3.4.3.5.6 IT Operation and Management

Although driven from the definitions of ServCo. services and business processes, the functional and target application maps have focused on technology. In performing a mission-critical and revenue-impacting role in the industry, ServCo. must also have robust IT operation and management functions. To identify all the aspects required in an IT organisation we have used our Technology Organisation Framework:

*Figure 3-12 PwC Technology Organisation Framework*
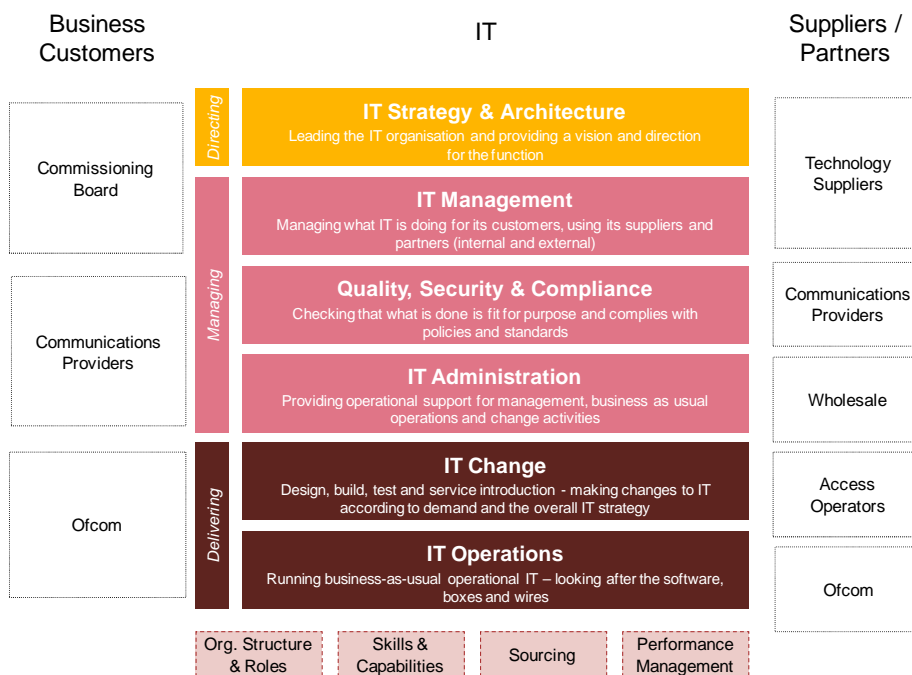


*Source: PwC*

#### 3.4.3.5.6.1 ServCo. Technology Strategy

Within IT strategy & architecture are processes which use enterprise architecture to align IT to the business strategy, such as IT Strategy, and Vision and IT Service Planning and Forecasting. We expect the activities in this domain to be performed and prescribed from outside the ServCo. organisation, by Ofcom and CPs. As such, from a cost perspective we believe the elements within this domain which must be performed by ServCo. itself are ones which can be fulfilled by an IT Director.

### 3.4.3.5.6.2 IT Service Management

There are a number of management processes which ServCo. must fulfil. Activities such as relationship management and capacity management have a considerable bearing on the infrastructure growth, as well as on-going costs of both TPV and Hub functions. We expect that changes in capacity are identified through CP relationships and growth via incremental change to IT systems managed through SLA agreements with the chosen technology supplier. It is expected these technology agreements will cover capacity management in both the TPV, (for example additional staff on the TPV call centre), and Hub, (for example additional processing capacity as switching demand increases).

More fundamental functions such as staff, financial and supplier management are also undertaken within in this domain. We expect that these management functions will be performed by the IT Operations Manager.

### 3.4.3.5.6.3 IT Quality and Compliance

Due to the nature of the transactions between the Hub with TPV, CPs, Wholesale and Access Operators, Quality, Security and Compliance is an important consideration for ServCo. It is expected that the IT Director will undertake a role of security officer so that the policies governing interfaces between all parties and the Hub are managed.

From the SWG use cases which we have used to derive the GPL TPV model, it is implied that CPs populate and update the Hub data. As such we understand that data ownership within the Hub falls to the CPs rather than ServCo. This means that on-going data management and quality is not a function which ServCo. will undertake. However, it is critical during the setup of the Hub that data is standardised across CPs and wholesale operators so that the Hub contains a single sanitised record of consumer services. To enable this, costs must be included to ensure a clear definition of the fields required by the Hub, and that the interfaces the Hub will provide meet requirements and the expectations of all parties.

Regarding compliance, we expect that Ofcom will monitor and audit the function of ServCo.. However it must be responsible for implementing processes and systems which can generate and collate the management and business information required by Ofcom and CPs.

### 3.4.3.5.6.4 IT Operations Management

The critical items within the IT administration domain, such as IT Finance, IT People Management and Procurement Management will be handled outside the realm of IT, to be managed by ServCo. The operations department will be housed under the Operations Director.

The design, build, testing and implementation of all aspects of IT within ServCo. fall within the IT Change domain. It is expected that these processes will drive the majority of the costs associated with setting up the IT function of both the TPV and Hub. As discussed within the sourcing model, the IT functions of the Hub and TPV are likely to be outsourced. As a result the detailed design of the TPV and Hub will be undertaken by selected technology suppliers on behalf of ServCo, based on their detailed requirements. In addition to these design costs, building, testing and implementation will also be undertaken by technology suppliers.

It is anticipated that change within ServCo. will be captured through the relationship and change management processes highlighted above, and that the requirements for change will be driven by implicit growth or by detailed change requests from CPs. As such all aspects of change, programme and project management will be performed by technology suppliers.

As a result of the outsourced relationship for IT services it is expected that all aspects of the IT Operations domain (Application Support & Maintenance, Server & Desktop Support & Maintenance, Network Support & Maintenance, Service / Help Desk, Data Centre Operations & Data Centre Management and Disaster Recovery & Continuity) will be provided by the appropriate technology partner.

The combined IT process domains map to the sourcing model is shown in the following figure, where the CPs and Ofcom represent the business directorates of ServCo.

*Figure 3-13 TPV IT Process Sourcing*
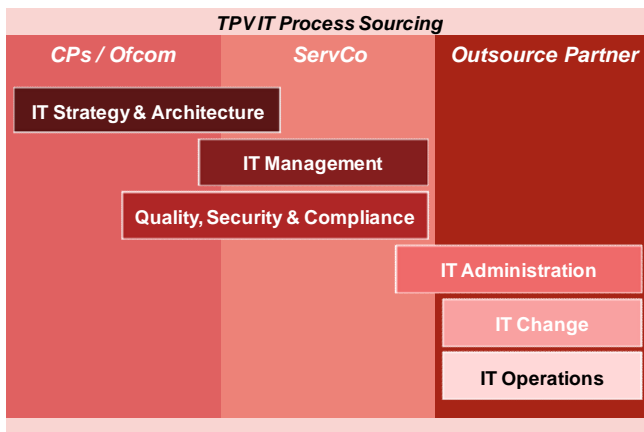


*Source: PwC*

Summarising the information and technology infrastructure:

- The IT infrastructure required by ServCo. will mainly comprise the provision of the Hub, which will be owned by ServCo. and run as a managed service provided by an outsourced organisation from their data centres;
- The technology required by the TPV Call centre operation will be provided as a fully managed service as part of an outsourced call centre provision; and
- Ancillary IT services required by ServCo, such as email and office productivity tools, will be provided as a cloud-based service.

## 3.5 What needs to be done for the GPL TPV model to become functional?

In order to take the industry from the 'as-is' state to the 'to-be', a large programme of work will need to be co-ordinated and managed.

In this section we identify who will be involved in the delivery of the programme and what activities will need to be undertaken.

### 3.5.1 Who will be involved in delivery of the programme?

Here we identify the entities involved in the delivery of the programme and the resources required. The diagram below summarises the changes to the industry required for delivering and then operating the GPL TPV model.

*Figure 3-14 GPL TPV model transition from set up to operate*
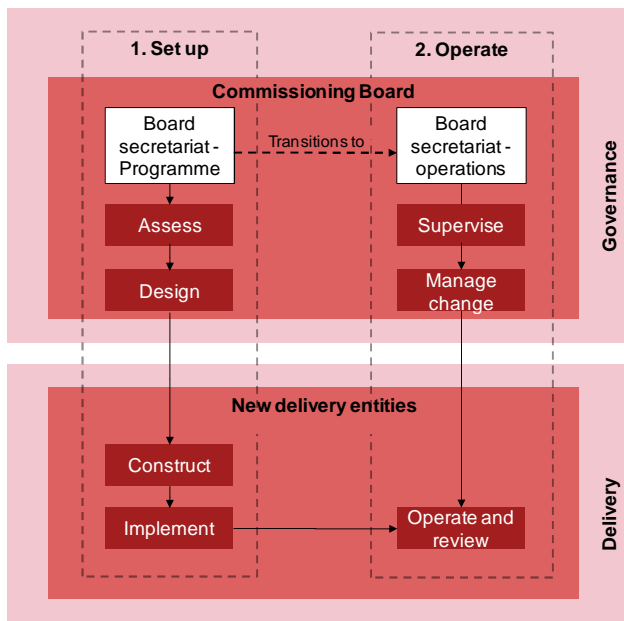


*Source: PwC*

In essence, the Commissioning Board acts as a Directing Board to, initially, instruct a Programme, then as the implementation matures, a management team completing and operating ServCo. While specific outcomes may vary, key features that we believe are intrinsic to such structures include:

- Industry players need to delegate specific decision making powers on design and budget to a Commissioning Board;
- The Commissioning Board needs to be controlled and supervised by industry stakeholders, for example by having senior CP employees sitting on the board;
- The Commissioning Board delegates day-to-day programme work to a programme function, and makes decisions on how and who populates this function; and
- The programme function's role will change as the project progresses, ideally linked to the achievement of specific milestones:

    – Mobilise by seconding directors from CPs;
    – Use delegated powers to recruit teams to establish a programme;
    – Obtain approval for fit for purpose detailed designs;
    – Prepare detailed plans for delivery of TPV/Hub entity/ entities;
    – Recruit key executives to agree plans for constructing TPV/Hub entity(ies) and delegate execution;
    – Managing programme including delegated actions within CPs and TPV/Hub entities.

Following implementation, the Programme function transitions to that of a smaller board 'secretariat', ensuring the Commissioning Board's governance mechanisms are supported by reports and papers evidencing decisions taken on matters arising (for example change, issues, escalations etc.).

*Table 10 Entity resources and responsibilities*

| Role | Time/resource | Responsibilities |
| --- | --- | --- |
| Regulated CPs | | Participate in quarterly governance events to direct the Commissioning Board |
| | | Provide delegate authority and budget to Commissioning Board to achieve the objectives set |
| Commissioning Board | | Set up and resource the mechanisms and entities required to deliver its objectives |
| | | Manage the performance of these entities and mechanisms |
| Board secretariat - Programme | Once a fortnight | Responsible to the Board(s) for all aspects of the programme |
| | | Accountable to the Board(s) for the delivery of the objectives within budget |
| | | Responsible for making all key programme decisions, incl. re: prioritisation, resolution of programme risks/issues and sign off of programme documentation |
| | | Responsible for providing visible leadership and commitment throughout Programme |
| | | Responsible for ensuring the balance between Business as Usual (BAU) and Programme and escalation of issues to the Board |
| | | Design authority |
| Board secretariat – Operations | 1-2 FTE | Prepare for Commissioning board meetings, ensuring the board has performance reports and decision making collateral, for example business cases, to make decisions required by the ServCo. management team |
| Programme Director | Part Time | Delegated authority from the Executive Steering Group (ESG) for day-to-day development and delivery of the Programme (and meeting ESG responsibilities) |
| | | Responsible for the reporting of Programme status and escalation of relevant decisions required and issues for resolution to the ESG |
| Programme Manager | Full Time | Delegated authority from the Programme Director for day-to-day management of the Programme workstreams and the workstream managers |
| | | Responsible for: |
| | | Managing the Programme Office |
| | | Developing and delivering the programme plan to time, cost and quality |
| | | Developing and delivering the cross-programme Day 1 and Logistics Plans |
| | | Identifying and monitoring significant risks/issues on behalf of the programme |
| | | Providing direction in the resolution of cross-workstream issues or other issues escalated from the workstreams |
| Delivery Entities (for example ServCo., CPs) | | Responsible for delivering inputs required for the delivery of the programme and Commissioning Board objectives |
| | | Responsible for running operations to deliver services at the required service levels |
| | | Note Delivery entity encompasses both TPV/Hub entities and CPs in their roles in the programme |

To manage risk and industry costs, the Commissioning Board will need to be supported by a programme covering people, technology, process, legal and commercial and procurement.

The table below defines the required roles. There are many precedents for these workstreams and the related resourcing in integration programmes. For example, the Ofgem 1998 programme to introduce competition in the UK electricity market (more details are provided in *section 5*) had a significant Central Integrated Design Authority function.

*Table 11 Role descriptions*

| Title | FTEs | Role description |
|---|---|---|
| Programme Director | 1 | Provides a single point of accountability to deliver the programme in accordance with the programme commitments |
| | | Retains full programme authority, within the limits of the established budget and operating policies, to manage and direct assigned programme resources and make decisions regarding the programme direction, |
| | | Establishes the programme resource assignments and ensures that the programme is properly managed and staffed, |
| | | Participates in Steering Committee meetings and decisions. |
| Project Analyst | 1 | Assist in the administration of development and maintenance of project management documents. Examples of documents include - Brief, Mandate, PID, Budgets, Estimates Spreadsheets, WBS, PBS, Workpackages, Plans, Checkpoint Reports, Highlight Reports, and Exception Reports etc |
| | | Facilitate project checkpoint meetings |
| | | Ensure accurate tracking and reporting of progress, performance to schedule and performance to budget of projects |
| | | Support the Programme Director with resource management including tracking of resource availability so new work can be scheduled |
| | | Assist with project risk and issue management and project change control |
| Architect and Central Design Authority | 1 | Maintenance of an end to end architecture, logical and physical design for the industry |
| | | Runs a forum for industry decision making on technical issues and designs |
| | | Definition of architectural standards and principles |
| | | Produces and maintains under change control, design documentation on which CPs, TPIs etc can rely in their technical preparations for integration of voice and data ICT |
| | | Runs change control process on end to end design for the industry to ensure it is coherent and all change impacts are understood prior to decisions being made |
| Core hub technical workstream lead | 1 | Specification in sufficient detail of requirements to drive separate procurement of software licences, ICT infrastructure, hosting services and integration services to enable delivery of the hub |
| | | Manages vendors to deliver to time, quality and cost |
| | | Manages acceptance and operational readiness testing |
| CP Technical Interface workstream lead | 1 | Specification in sufficient detail of the interfaces the Hub will support to provide interconnection to the systems of relevant parties |
| | | Specification of infrastructures, wide area network services and software licences to deliver hub interface services at the required service levels |
| | | Obtain agreement of those parties to the specifications, advise the Architect and Central Design Authority on changes required |
| | | Monitoring and managing CP preparations to ensure that risks to the Go Live date are understood and escalated to the programme |
| Procurement and commissioning Workstream lead | 1 | To ensure procurements are fair and comply to relevant EU legislation |
| | | Lead the development of commissioning strategies in conjunction with other workstream leads |
| | | To develop requests for proposals and supervise the tendering process for the allocation of contracts to suppliers |
| Process Workstream | 1 | To develop and obtain agreement to the final versions of the high level industry processes and maintain them under change control |

| Title | FTEs | Role description |
|---|---|---|
| Lead | | To ensure clear requirements exist for protecting customer experience and reflecting them in processes, service levels and service definitions |
| | | To develop business processes and policies required for running ServCo |
| | | To ensure that any process detail on which ServCo relies that is provided by a third party is fit-for-purpose |
| Contact centre workstream lead | 1 | Specification in sufficient detail of requirements for TPV services to drive a procurement outsourced contact centre services, including service levels, commercial model, requirements for revenue at risk to performance etc |
| | | Preparation of volumetric requirements for launch and a mechanism to maintain them in on-going operation after Go Live |
| | | Manages vendors to deliver to time, quality and cost |
| | | Manages acceptance and operational readiness testing |
| Legal and commercial workstream lead | 1 | To ensure that the commercial requirements of the end to end solution design are correctly captured and agreed, covering commercial model (for example unit prices), obligations between ServCo and its customers, and ServCo and the regulator |
| | | Ensure mechanisms for fair recovery of cost from industry players are in place and backed by suitable incentives |
| | | Ensure any bilateral or multilateral contracts that are required both during the implementation and then in subsequent operations, are defined and agreed at the appropriate time |

The Commissioning Board will also need CP resource to contribute to the Commissioning Board management and decision making, and provide inputs into the workstream. This will require 1-2 FTE(s) in total.

## 3.5.2 What activities will be included in the programme?

In this section we outline the key activities that will be involved in the set up and operation of the GPL TPV model and identify the corresponding resource requirements.

We have used as a checklist to ensure completeness, our "Transform" method and framework to capture all the work we believe to be required. The framework provides a route map for implementing the strategic, people, process, technological, structural and facilities changes required to implement new or amended business strategies. We have successfully applied this framework for public and private sector clients, to guide organisations through the design and implementation of major changes projects.

*Figure 3-15 Transform method diagram*
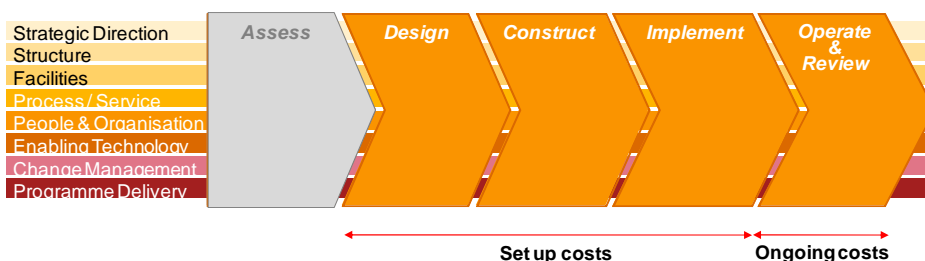


*Source: PwC*

A significant amount of work is required to bring the GPL TPV model into operation. The tasks involved can be usefully categorised into four key phases: Assess; Design; Construct; and Implement.

The design, construct and implement stages represent the work required to operationalise the GPL TPV model. We have not included the assess phase in our cost assessment as these activities will have been completed as part of the Ofcom consultation.

The following paragraphs discuss the approach within this framework, the work required, and provide estimates of the workload and timeframes required.

### 3.5.2.1  Design
The Design stage is used to define the organisation and to explore and develop the implementation strategies. We have planned for the following activities to be undertaken in this stage:

- The Commissioning Board will provide steering and governance to the programme to set up the GPL TPV model;
- The programme team will develop an organisation design for ServCo.; perform the requirements analysis and complete SLA development for Hub services; conduct RFI analysis; and initial High Level Design and implementation plan for Hub;
- The programme team will initiate the programme of work for gathering requirements for delivery of TPV services;
- Concerning the interface with the Hub, the industry will need to enumerate process changes implied by the GPL TPV model, develop Technology High Level Designs (HLD) and, for some players, they may need to interface with TPIs regarding new technology requirements; finally, they will need to design changes to Customer Order Management (COM), Customer Problem Management (CPM), Service Order Management (SOM) and Service Problem Management (SPM) processes;
- In terms of Voice ICT preparation, the industry will also need to document its requirements, inclusive of mandatory and desirable features.

### 3.5.2.2  Construct
The Construct Stage is used to complete the detailed design of the new organisation and to prepare the detailed implementation plans. We have planned for the following activities to be undertaken in this stage:

- The Commissioning Board will continue to provide funding and steering governance to the programme to set up the GPL TPV model;
- The programme team will define the enterprise management processes for ServCo. and will issue the RFP to select the preferred suppliers for Hub and TPV services;
- Concerning the Hub, the programme team will begin to source the licenses and complete the hardware installation, facilities preparation and testing; and
- The industry will modify systems to provide Customer Order and Service Order changes to cater for the implementation of TxC and of the new Hub interface.

### 3.5.2.3  Implement
The Implement Stage is used to implement the components of the new organisation and to provide training that supports the change initiative's goals. We have planned for the following activities to be undertaken in this stage:

- The Commissioning Board will continue to provide funding and steering governance to the programme to set up the GPL TPV model;
- The programme team will begin the recruitment of ServCo. personnel and complete the operations testing of TPV services;
- The industry will conduct localised regression testing on modified systems, and will conduct integration testing with the Hub.

### 3.5.2.4  Operate and Review
The Operate and Review Stage focuses on operating the organisation, delivering the benefits and instigating a culture of continuous improvement. We have planned for the following activities to be undertaken in this stage:

- The Commissioning Board will provide regular governance and supervision to ServCo;

- ServCo. will conduct business as usual activities as outlined in section 3.3 - *What processes will the entities in the GPL TPV model execute to provide these services?*
- The industry will need to maintain all data records in the Hub. This will be performed automatically through the B2B Hub interface as CPs own records are modified.

In summary:

- To operationalise the GPL TPV model, regulated CPs will need to set up and empower a Commissioning Board to deliver a programme to create new entities to deliver TPV and Hub services, together with the CP changes required.
- Governance cost is driven by the duration of any programme and by the complexity of the tasks required to deliver the required outcome. In this instance, we believe that the scale of change and the range and number of industry players impacted by it will lead to a significant cost of governance.
- The Industry will need to empower and fund a team of CP delegates to commission designs and deliver industry-required change, and play leadership and supervision roles on the Commissioning Board.

# 4 Developing an independent cost assessment for setting up and running the GPL TPV model

In this section we detail the costs to set up and operate each of the entities identified in section 3.1. We provide a breakdown of the cost elements for the Commissioning Board, ServCo, TPV services and the Hub together with changes required to CP interfaces and processes.

## 4.1 Commissioning Board

As we discussed in section 3.5, the Commissioning Board is required to ensure an efficient delivery of the GPL TPV model and, once this is ready, to effectively manage and steer the activities of ServCo.

In our scenario analysis, we have estimated the cost of the activities incurred by the Commissioning Board over a 10-year period to be between £3,587,000 and £7,412,000 , with a base scenario of costs amounting to £4,418,000 .

We provide a summary description of our cost assessment in the table below.

*Table 12 Commissioning Board delivery costs*

| Element | Cost | Comment |
|---|---|---|
| Programme management to set up the GPL TPV model | £4,418,000 | In the base scenario analysis, this includes a total of 2,736 man days ( 8 FTEs in the programme office for a total of 18 months). FTEs are Subject Matter Experts which are sourced to ensure effective programme delivery. |
| | | It also includes 270 man days ( 10 FTEs, 1.5 days per months for the whole duration of the programme) to constitute the programme's steering group team. |
| On-going governance and supervisory (NPC over a 10-year period) | £981,000 | In the base scenario analysis, this includes 180 man days per annum ( 10 FTEs acting as board members 1.5 days per month) to offer governance and supervision to ServCo. |
| **Total** | **£5,399,000** | **NPC over a 10-year period** |

Our cost estimation is based on what we consider to be good practice in the delivery of this type of programme and on our experience of programme delivery for our clients.

## *4.2 ServCo.*

The GPL TPV model requires the delivery of TPV and Hub services from a single entity, which we have referred to as ServCo. in this report.

In this section, we present our estimate for the three main cost areas associated with ServCo, namely:

- ServCo. management overhead costs;
- Hub Service delivery costs; and
- TPV service delivery costs.

### 4.2.1 ServCo. management overhead costs

In section 3.4, we set out the PwC TOM framework used to describe ServCo, the entity that will deliver TPV and Hub services within the GPL TPV model.

In our sensitivity analysis, we have estimated the cost incurred by ServCo. over a 10-year period, to be between £7,054,000 and £13,261,000 , with a base scenario of costs amounting to £9,806,000 .

We provide in the table below a summary description of our cost assessment.

*Table 13 ServCo. delivery costs*

| Element | Cost | Comment |
|---|---|---|
| Design and structure ServCo. (set up cost) | £818,500 | In the base scenario analysis, this includes a total of 60 man days ( 2 FTEs for 30 days) to deliver a project to define ServCo.'s organisation design and its key functional (HR, IT, Finance, Administration, etc.) processes. FTEs are Subject Matter Experts which are sourced to ensure effective programme delivery. |
| Initial recruitment of ServCo. staff (set up cost) | £63,200 | In the base scenario analysis, this includes the recruitment of 16 staff at a cost of £3,950 per staff (recruitment cost is the average recruitment cost of filling a vacancy in the UK (using any method) as provided by the Recruitment & Employment Confederation. |
| **Total set-up costs** | **£882,000** | |

| Element | Cost | Comment |
|---|---|---|
| Personnel (on-going annual cost) | £988,154 | In the base scenario analysis, this includes basic salaries (estimated on the basis of current market rates for these job descriptions), training costs (in 2007 £1,750 was the average spend per capita in the UK), on-going recruitment to address staff attrition of 15% (UK average), national insurance tax (12.8%), an annual bonus of approximately 10% and other staff benefits (including health insurance, work insurance and a defined contribution pension scheme). |
| Office rental (on-going annual cost) | £81,600 | In the base scenario analysis, this reflects the market rate for renting a serviced office in Southampton (this location has been selected as the median of market rates) at a cost of £425 per month per member of staff. |
| Other overheads (on-going cost) | £3,150 | In the base scenario analysis, this includes ordinary cost items incurred by a typical business of this size, namely: Legal costs (£2,100 per annum), sundry office consumables (£884 per annum) and Telephone / Fax Communication - Monthly line rental (£218 per annum). |
| Total cost per annum | £1,073,000 | |
| **Total** | **£9,806,000** | **NPC over a 10-year period (set-up costs plus annual costs over 10 years, discounted at 3.5%)** |

Our cost estimation is based on various official and market sources which we have consulted during our research. Details of these sources and our cost evaluation are provided in the *Appendix C*.

## 4.3 Hub Service delivery costs

In section 3.2 we set out the services that the Hub will need to deliver within the GPL TPV model.

We have estimated the costs of the Hub over a 10-year period to be between £13,950,000 and £25,903,000 with a base scenario of costs amounting to £19,927,000 .

We provide in the table below a summary description of our cost assessment.

*Table 14 Capital and Operational Hub service delivery costs*

| Element | Cost | Comment |
| --- | --- | --- |
| Capital cost to setup Hub Services | £7,169,000 | Driven primarily by man days of development and testing to create a new enterprise class database and middleware system. |
| Annual cost for running Hub | £1,534,000 | Driven by the cost of software and hardware support and service management |
| Total cost for running Hub (NPC over a 10-year period) | £12,758,000 | Annual cost x10, discounted at 3.5% |
| **Total** | **£19,927,000** | **NPC over a 10-year period** |

The capital costs can be broken down into five areas which are summarised below.

*Table 15 Breakdown of Hub capital delivery costs*

| Element | Cost | Comment |
| --- | --- | --- |
| a) Draft High Level Design (HLD) to drive RFI | £164,300 | Business Requirements Analysis (BRA) phase drives an initial HLD sufficient to issue an RFI to potential suppliers |
| b) RFP issued and suppliers selected | £372,000 | Refinements to HLD including detailed API design. RFP issued and supplier(s) selected |
| c) Infrastructure Installation | £1,896,250 | Purchase all hardware and source data centre, DR and backup and archive contracts. Two months to install and harden all systems. |
| d) System Design, Code and Unit Testing | £3,117,373 | Implement system software and make all development changes. Test isolated software components. |
| e) System Integration, User Acceptance and Operational Acceptance Testing | £1,619,200 | Perform System Integration Testing (SIT), User Acceptance Testing (UAT) and Operational Acceptance Testing (OAT) |
| **Total** | **£7,169,000** | |

## 4.3.1  How much will it cost to design the Hub services?

Before a technology partner(s) can be selected to provide and run Hub services a high level design must be created based on a thorough Business Requirements Analysis. This drives a list of detailed functional requirements, an exhaustive list of Non-Functional Requirements and an initial set of Service Level Agreements. A draft high level design can then be created to solicit Request for Information (RFI) responses from potential suppliers. On the basis of our experience of developing requirements for similarly complex environments, we estimate the costs of this workstream, as follows:

*Table 16 ServCo. actions and investment*

| Element | Unit | Unit Cost | Total cost | Comment |
|---|---|---|---|---|
| Requirements analysis and SLA development | 48 man-days | £1,550 | £74,400 | FTEs are Subject Matter Experts which are sourced to ensure effective programme delivery. |
| RFI analysis and initial High Level Design | 58 man-days | £1,550 | £89,900 | FTEs are Subject Matter Experts which are sourced to ensure effective programme delivery. |
| **Total** | | | **£164,300** | |

## 4.3.2 How much will it cost to select a service provider for Hub services?

Refining the high level design will solidify SLAs and will provide sufficient information to allow a potential service provider to develop a detailed Low Level Design sufficient to develop and build the Hub services environment. Significant time here is devoted to the detailed design and specification of the API to be used to interface to the Hub database. Detailed design should be completed here to allow CPs sufficient time to perform their own interface designs and start integration workstreams.

RFPs are issued to suppliers, a preferred partner is selected and support is provided to contract negotiations.

*Table 17 High Level Design and Supplier selection*

| Element | Unit | Unit Cost | Total cost | Comment |
|---|---|---|---|---|
| High Level Design with detailed API specification | 160 man-days | £1,550 | £248,000 | FTEs are Subject Matter Experts which are sourced to ensure effective programme delivery. |
| RFP issue, analysis and preferred supplier selection | 80 man-days | £1,550 | £124,000 | FTEs are Subject Matter Experts which are sourced to ensure effective programme delivery. |
| **Total** | | | **£372,000** | |

## 4.3.3 How much will it cost to deliver Hub services?

To provide the most accurate assessment of costs we have adopted a bottom-up approach based on the activities and costs associated with a complex system build of this magnitude. We recognise that it is common for a Systems Integrator (SI) to pass through the capital costs associated with system build in their service charges. We have reflected this in our modelling by including build costs as an upfront capital cost.

### 4.3.3.1 Infrastructure Installation

Capital investment in hardware is significantly reduced in this implementation from the heavy adoption of cloud-sourced products; however an investment is still required to support the Hub database and middleware systems. This will consist of a resilient infrastructure throughout to protect against isolated systems failures.

In addition to infrastructure assets contained within the Hub hardware costs is provision for data centre space, backup & archive, and for protection in the event of a complete loss of all IT systems a Disaster Recovery (DR) solution is provided with a third party provider.

Hardware and Operating System delivery teams will be two network engineers, one security specialist, two UNIX engineers and one storage engineer. Initial installation will be conducted over a one month timeframe using reduced, with a further month for O/S hardening. A further two network engineers and two security specialists are introduced over this period.

The Project Management Office (PMO) will be created for the duration of implementation based on a core team of one project executive, one project manager, one lead architect and one lead analyst.

*Table 18 Hardware and Software*

| Element | Unit | Unit Cost | Total cost | Comment |
|---|---|---|---|---|
| Hub hardware capital | 1 | £1,456,250 | £1,456,250 | Oracle SPARC hardware, dev/test environment, provision for DR and backup / archive |
| Hardware installation and facilities preparation | 120 man-days | £800 | £96,000 | One month duration |
| O/S hardening and Security Testing | 270 man-days | £800 | £216,000 | One month duration |
| PMO for Infrastructure | 160 man-days | £800 | £128,000 | |
| **Total** | | | **£1,896,250** | |

## 4.3.3.2 System Development

The primary drivers for costs of systems development arise from creation of the Hub database and business logic interfaces. Prior experience of delivering similar scale projects suggests an aggressive implementation timescale of four months, which will keep resource costs to a minimum.

The longest lead time item is delivery of the Hub system itself. We have modelled this assuming a team of four system analysts, seven application developers, two systems architects and two project managers. In parallel, CRM, ERP and Collaboration workstreams will be run. These will have lower delivery times due to cloud-sourcing which will allow a degree of flexibility of developer and analyst resources across workstreams.

CRM and ERP workstreams each constitute one architect, one project manager, two analysts and two developers. These will be flexibly deployed alongside the Collaboration workstream which comprises one project manager and two developers.

*Table 19 Design Code and Unit Testing*

| Element | Unit | Unit Cost | Cost | Comment |
|---|---|---|---|---|
| Software Licences | Per CPU socket | | £1,261,373 | Oracle Middleware and Database |
| B2B interfaces and Hub database | 1,200 man-days | £800 | £960,000 | Four month duration |
| TPV Customer Relationship Management System | 280 man-days | £800 | £224,000 | Two month duration due to cloud sourcing |
| ServCo. Enterprise | 280 man-days | £800 | £224,000 | Two month duration due to cloud sourcing |

| Element | Unit | Unit Cost | Cost | Comment |
|---------|------|-----------|------|---------|
| Resource Planning System | | | | |
| ServCo. Collaboration Platform | 160 man-days | £800 | £128,000 | Two month duration due to cloud sourcing |
| Environment build and release programme management | 400 man-days | £800 | £320,000 | Programme management including software build and release management. |
| **Total** | | | **£3,117,373** | |

### 4.3.3.3  Integration Testing

Extensive testing must be conducted to ensure that systems processes operate as designed, CPs can interface securely and data integrity can be assured without risk of corruption.

Test planning will be conducted for a one month period using four test developers, six testers, one project manager, one Architect and one lead analyst. During this time, detailed test scripts will be written. Testing will be conducted using automated tools to reduce timescales to a minimum. Our experience suggests aggressive timescales of six weeks for System Integration Testing and a further six weeks of User Acceptance Testing. A final one month of Operational Acceptance Tests and penetration tests are then conducted prior to system go live.

Test support is provided by development resources on a decreasing scale as defects are reduced. Initially the resource team will have a similar size and workstream representation to the build team. This will scale down over the duration of testing to a minimal support team which will continue for the first month of go live. Based on our experience we believe this can be modelled as a resource profile of 10% of the total build effort.

*Table 20 System Integration and User Acceptance Testing*

| Element | Unit | Unit Cost | Cost | Comment |
|---------|------|-----------|------|---------|
| Test Planning | 240 man-days | £800 | £192,000 | Conducted in parallel to DCUT workstream |
| System Integration Testing | 420 man-days | £800 | £336,000 | Six week duration |
| User Acceptance Testing | 420 man-days | £800 | £336,000 | Six week duration |
| Penetration testing and Operational Acceptance Tests | 280 man-days | £800 | £224,000 | One month duration |
| Development Resource Support for Test and post go-live | 264 man-days | £800 | £211,200 | Test support provided over the four month test window and a further one month post go live |
| Environment build and release programme management | 400  man-days | £800 | £320,000 | Programme management including software build and release management. |
| **Total** | | | **£1,619,200** | |

### 4.3.4 How much will it cost to operate Hub services?

The table below summarises the annual costs for running Hub services. Ongoing costs for hardware and software maintenance are calculated based on an industry recognised figure of 20% of capital costs. This figure has also been verified based on Oracle list prices for both Oracle Enterprise Edition and Oracle Weblogic.

To model data centre and backup & archive costs we have adopted a commercial model commonplace in the outsourcing industry, where costs are calculated and billed on the basis of consumption. The metrics used for this are per kilowatt, and per gigabyte streamed respectively. Backup will follow a standard one month full with daily incremental for all change data. Annual testing and maintenance of Business Continuity (BC) and Disaster Recovery (DR) plans are included with an outsourced DR facility.

Cloud-sourcing CRM, ERP and collaboration platforms drives a per user monthly operational cost. The flexible nature of these services allows for on-going growth, or reduction as required. Service management and support for the Hub environment will be included in annual service charges from the outsourced supplier. We have modelled this based on experience of delivering projects of a similar size at scale at 10% of the cost to build.

It is common practice within IT outsourcing to use a five year useable life for hardware assets. We have considered this and have included a hardware refresh in year 6. Costs for this have been based on the hardware infrastructure costs and installation time blended into a per annum service charge as would be expected from an IT outsourcing agreement.

*Table 21 Hub annual operational costs*

| Element | Cost | Comment |
|---|---|---|
| Hub HW and SW support and maintenance | £641,573 | On-going costs to Oracle for maintenance and support of database and middleware licences |
| Data centre, Backup & Archive and Disaster Recovery | £240,250 | Running for data centre. On-going running costs for backup and archive and disaster recovery outsource agreements. |
| Cloud Sourcing Licences | £209,373 | Includes per month licences for CRM, ERP and Office365 |
| Service Management and Support | £442,944 | Day to day operational support of the entire Hub environment provided by the outsourced contractor |
| Per Annum proportion of year-six Hardware Refresh | £87,700 | A hardware refresh will be required in year six, based on the same costs as used during setup, but apportioned across the term. Day to day operational support of the entire Hub environment provided by the outsourced contractor |
| **Total per annum** | **£1,534,000** | |

## 4.4 TPV service delivery costs

In *section 3.2,* we set out the services and services levels that ServCo. is required to provide in relation to call handling and consent validation.

In our scenario analysis, we have estimated the net present cost of setting up and delivering TPV services over a 10-year period to be between £23,731,000 and £71,500,000 with a base scenario of costs amounting to £44,480,000 . It should be noted that, for the lower range estimate to materialise, every favourable variance needs to occur. For the higher range estimate to materialise, every unfavourable variance needs to occur. To produce a narrower range, design for the programme needs to be completed and a "Monte Carlo" analysis performed to understand the most reasonable best and worst case cost scenarios.

We provide in the table below a summary description of our cost assessment.

*Table 22 Summary of TPV service delivery costs*

| Element | Cost | Comment |
|---|---|---|
| Set Up cost for TPV operations | £1,461,600 | This is mainly driven by project management and procurement costs |
| Industry investment in Voice ICT preparations at Wholesalers, large CPs and TPIs | £3,787,822 | Driven by the number of relevant entities (CPs etc) that implement projects integrating directly to the TPV oursourcer's/outsourcers' voice and data ICT infrastructure. Per project costs are driven by resource and technology costs |
| Industry investment in Voice ICT preparations at smaller CPs using Wholesalers or TPIs | £3,021,053 | Driven by the need for a high number of smaller CPs ( that is those using Wholesalers or TPIs for conformant processing solutions) to have in place a solution to transfer a caller and relevant reference data to ServCo.'s TPV by either a CTI transfer or via a Whisper transfer |
| **Total set-up costs** | **£8,270,000** | |

| Element | Cost | Comment |
|---|---|---|
| Annual cost for ServCo. Service delivery | £4,297,991 | Driven by volume, cost per productive minute and average handling time |
| Annual cost for transferring account details from CP to TPV function | £56,121 | Driven by the cost of voice network infrastructure to enable the transfer of GP account reference data to TPV service delivery personnel |
| Annual cost | £4,354,000 | |
| **Total** | **£44,480,000** | **NPC over a 10-year period (set-up costs plus annual costs over 10 years, discounted at 3.5%)** |

## 4.4.1 *How much will it cost to set up TPV operations?*

Set up of GPL TPV operations will require both Commissioning Board/ServCo. and CP actions.

ServCo. actions and investment:

• Project manage implementation;
• Specify and select outsourced contact centre providers;
• Negotiate and contract with chosen service provider(s); and
• A period of operational readiness testing with the industry.

These costs will vary depending on the complexity of the service being outsourced, the nature of the procurement procedure followed, and the ability to leverage pre-existing Intellectual Property, for example existing specifications. Examples of recent analogous projects of which we are aware include:

• Specification, selection and contracting of contact centre services for government department – c £1.2M including legal fees;
• Specification, selection and contracting contact centre services for utility department – c £0.7M including legal fees.

On the basis of this experience we regard the below as a reasonable estimate for the costs of this workstream.

*Table 23 ServCo. actions and investment*

| Element | Unit | Unit Cost | Total cost | Comment |
|---|---|---|---|---|
| Project management | 342 man-days | £1,550 | £530,100 | Assumes a high-end contractor |
| Procurement work - package | 570 man-days | £1,550 | £883,500 | Specialist teams, including legal advice, five FTE for six months. Based on recent projects run by a member of the PwC team |
| Operations Testing | 60 man-days | £1,550 | £48,000 | Two FTE for 30 days |
| **Total** | | | **£1,461,600** | |

## 4.4.2 How much will it cost to prepare CPs to transfer calls to the TPV provider?

CPs will need to invest in preparation to enable them to transfer customers to TPV functions, along with essential data to enable the TPV service provider to process their call, without the poor customer experience that a cold transfer would involve.

*Table 24 Cost – set up and CTI integration*

| Element | Unit/Unit cost | Comment |
|---|---|---|
| ServCo Costs | £265,348 | See below for estimate for industry costs for IVR script development, CTI design, integration. |
| Third Party Integrators, wholesalers, larger telemarketers and larger CPs costs | 28 x £125,803 | |
| Smaller CPs requiring a non TPI, non CTI solution for call transfer | 287 x £10,526 | |
| **Total industry investment** | **£6,808,875** | |

### 4.4.2.1 Options for call transfer – customer and data to TPV service provider

There are two sources of complication that are addressed in our design for voice (and data) solutions to support the introduction of the GPL TPV model.

- There are a number of possible systems that could be used to support a switch;

    – CPs' own systems;
    – Wholesalers' PRM systems; and
    – Third Party Integrators solutions, either as managed service or provision of software.

- There are a high number of potential "players" in the industry. Without careful design, the changes required could generate a high number of projects that will be: (1) costly for the industry; (2) costly to manage; and (3) carry the risk of being difficult to manage. Our proposed solution delivers a minimum number of substantive projects across a stakeholder base that includes:

    – Over 300 CPs, and the outsourced call centres or telemarketing services businesses they use for campaigns;

- A number of Third Party Integrators (between six and 12); and
- A small number of Wholesalers.

To contain the number of projects, our design is based on the premise that smaller CPs can obtain cost effective access to systems that support compliant switch processing from a small number of sources, and do not need to make such investments directly themselves. In essence they can benefit from economies of scales that wholesalers, Third Party Integrators and larger telemarketers can gain by investing to serve multiple CPs.

The table below identifies a number of options for delivering a customer experience during the transfer of consumers from GP to TPV service provider. Given the number of CPs, options using standard CTI integration techniques between the CP's systems and those of the TPV service provider would be very expensive.

*Table 25 Customer experience options during the transfer of consumers from GP to TPV*

| Option | Overview | Customer experience | Cost |
|---|---|---|---|
| Cold transfer | Gaining party CSA simply blind transfers the callers to the TPV queue<br><br>TPV CSA performs search for case to be validated or asks customer for a reference number | Poor customer experience<br><br>Will impact sales revenues | Higher opex option – more TPV CSA effort required to process call |
| Warm transfer | Gaining party CSA queues on their own or with the customer for a TPV CSA. When through, the GP CSA provides a reference number to a TPV CSA | Best customer experience<br><br>Neutral on sales | Highest opex cost option – more TPV CSA effort required to process call |
| Whisper transfer | Gaining Party's systems are Computer Telephony Integration) CTI integrated to its IVR and ACD and can share a reference number via CTI links<br><br>Gaining party CSA "blind" transfers the caller - to the Gaining Party's IVR to listen to messages/music, The IVR places a call to the TPV's ACD queue, whilst "whispering" "reference number xyz, press one to connect to customer" and repeating this until the TPV CSA has noted the reference and accepted the call | Reasonable customer experience provided wait times are low | Lowest opex option<br><br>For large CPs, some capex required to develop IVR script and CTI links<br><br>Avoids complex integration at with TPV systems |
| CTI enabled transfer (ACD) | GP' systems are CTI integrated to the TPV's<br><br>Calls are blind transferred to the TPV service provider. The reference number and relevant screens are "screen popped" to the TPV CSA, who can commence validation immediately | Reasonable customer experience provided wait times are low | Significant capex for set up<br><br>Technical challenge for TPV ACD infrastructure to interface to hundreds of CPs using CTI technology |
| CTI enabled transfer (Network) | Gaining Parties' systems are CTI integrated to a Telecom service provider's network. Network. Through on-site equipment at the TPV service provider, the network can pass a reference number and caller to TPV's systems.<br><br>Calls are blind transferred to the TPV service provider. The reference number and relevant screens are "screen popped" to the TPV CSA, who can commence validation immediately | Reasonable customer experience provided wait times are low | Significant capex for set up and opex for network services and gateway systems to interface to ACDs.<br><br>Not universally applicable |
| CTI enabled transfer TPV co-located with GP | TPV has a one-to-one relationship with a GP and uses systems that are part of the GP's contact centre ICT infrastructure | Reasonable customer experience provided wait times are low | Incremental capex for GP, but avoided capex on specialised CTI |

CTI is specialised technology that in recent years has become far easier and more cost effective to implement. However, where TPV service providers have a one-to-many GP relationship, there could be a requirement for integration to hundreds of CP systems. This would be very complex and expensive to achieve. For example, assuming £150k implementation and license costs per CTI integration between the CPs unique systems and TPV's, and say, 200-300 CPs, gives an industry cost of £30M-£45M.

## 4.4.2.2 Cost per CP project to set up to transfer caller with data to TPV provider

Three unit costs cost have been estimated for the projects required in the industry. These are costs borne by:

- ServCo. for integrating its voice systems with the Third Party Integrators, wholesalers and larger telemarketers to deliver an end to end solution to support the transfer of callers with data to a TPV service provider;
- Third Party Integrators, wholesalers, larger telemarketers and larger CPs with sufficient volume to make CTI commercially feasible to ensure their systems support the transfer of callers with data to a TPV service provider; and
- A smaller CP that wished to transfer a caller directly to the TPV service provider without the complexities of a two party CTI project, using a "whisper" transfer that does not require a technically challenging integration to a third party.

### 4.4.2.2.1 ServCo costs

Most CTI projects in contact centres involve bilateral relationships between a client's and service provider's systems. ServCo. needs to deliver a technically complex project that allows more than a dozen entities' systems to integrate to its own to allow the transfer of customer data.

*Table 26 ServCo. costs*

| Element | Units | Unit cost | Total cost |
|---|---|---|---|
| Document requirements, mandatory and desirable features | 5 | £710 | £3,548 |
| Engage with the industry to obtain input to specifications | 15 | £710 | £9,225 |
| Prepare and publish specifications to which Third Party Integrators, wholesalers, larger telemarketers and larger CPs must conform | 20 | £710 | £14,193 |
| Design solution to deliver service specified to industry | 20 | £710 | £14,193 |
| Purchase CTI technology licenses and required infrastructure | 1 | £100,000 | £100,000 |
| Build and test CTI solution | 40 | £710 | £28,386 |
| Build and test ACD integration | 20 | £710 | £14,193 |
| Build and test Hub integration | 30 | £710 | £21,289 |
| Obtain configuration data from Third Party Integrators, wholesalers, larger telemarketers and larger CPs | 10 | £710 | £7,096 |
| Integrate each Third Party Integrators, wholesalers, larger telemarketers and larger CPs | 50 | £710 | £35,482 |
| Perform operational readiness testing with each Third Party Integrator, wholesaler, larger telemarketer and larger CP | 25 | £710 | £17,741 |
| **Total** | | | **£265,348** |

#### 4.4.2.2.2 Third Party Integrators, wholesalers, larger telemarketers and larger CPs costs

*Table 27 Third Party Integrators, wholesalers, larger telemarketers and larger CPs costs*

| | |
|---|---|
| Cost per project | £125,803 |
| **Total cost for solution for segment** | **£3,522,474** |

The costs above are based on CTI integration projects, spread across 28 industry players.

*Table 28 Unit costs of a typical TPI*

| Element | Units | Unit cost | Total cost |
|---|---|---|---|
| Convert into designs TPV specifications to which Third Party Integrators, wholesalers, larger telemarketers and larger CPs must conform | 10 man-days | £710 | £7,096 |
| Perform gap analysis with existing solutions and infrastructure to understand changes required to use CTI to transfer caller and data to TPV | 30 man-days | £710 | £3,548 |
| Design solution to deliver service specified to industry needs | 20 man-days | £710 | £10,645 |
| Prepare business case to obtain funding | 5 man-days | £710 | £3,548 |
| Purchase additional CTI technology licenses and required infrastructure | 1 man-days | £30,000 | £30,000 |
| Build CTI solution and unit test against TPV specification | 40 man-days | £710 | £14,193 |
| Build ACD/Power dialler solution and unit test against TPV specification | 20 man-days | £710 | £14,193 |
| Build Hub solution and unit test against TPV specification | 30 man-days | £710 | £21,289 |
| Integrate to TPV systems | 15 man-days | £710 | £10,645 |
| System and performance testing | 30 man-days | £710 | £7,096 |
| Perform operational readiness testing with each Third Party Integrators, wholesalers, larger telemarketers and larger CPs | 25 man-days | £710 | £3,548 |
| **Total** | | | **£125,803** |

#### 4.4.2.2.3 Smaller CPs requiring a non TPI, non CTI solution for call transfer

We have estimated the potential unit set up costs for a segment of smaller CPs that either do not wish to use a TPI or wholesaler solution for accessing the Hub, or who wish to integrate their own systems to ServCo.'s TPV and Hub. The total cost for 287 CPs in the smaller segment is £3,021,053 .

These are implementation costs for changes to voice infrastructure and CTI, which are required to enable a CP or its outsourced telemarketing operation to send callers with reference data to the TPV.

*Table 29 Cost per smaller CP project to set up to transfer caller with data using whisper transfer/or CTI integration with TPI third party*

| Element | Units | Unit cost | Total cost |
|---|---|---|---|
| Document requirement, mandatory and desirable features | 2 man-days | £439 | £877 |
| Perform Gap analysis against existing CTI functionality | 1 man-days | £439 | £439 |
| Assess impact of volumetrics of transactions to be processed on infrastructure, that is transaction costs | 1 man-days | £439 | £439 |
| Define application for Release | 3 man-days | £439 | £1,316 |
| Define release 1 implementation plan | 1 man-days | £439 | £439 |
| IVR script and server application development | 10 man-days | £439 | £4,386 |
| Integration work between IVR and CTI servers | 3 man-days | £439 | £1,316 |
| Integration Testing | 3 man-days | £439 | £1,316 |
| **Total** | | | **£10,526** |

## 4.4.3 *How much will it cost to deliver TPV services?*

We have used, as the basis of our costs, a commercial model commonplace in the outsourcing industry, whereby operational costs are calculated and billed on the basis of the consumption of "productive minutes". The expression below gives an all-inclusive cost in an appropriate period.

[Annual operating cost] = [Cost per productive minute] x [Average Handling time] x [Annual call volume].

*Table 30 Breakdown of TPV service costs*

| Driver | Value | Comment |
|---|---|---|
| Cost per productive minute | £0.48 | This is based on prices from tenders received by PwC from 10 vendors during procurements and our own cost model. |
| Average handling time | 226 seconds | This is a blended duration from estimated call handling times of two call types across each sales channel - (1) those resulting in consent being validated and (2) those where the customer cancels during validation. It includes an estimate that TPV validation of an online order requires one productive minute. |
| Annual call volume | 2,375,162 calls | Includes 273,249 cancel order calls (or 13% of switching orders). Note this is based on historical data and does not consider the potential impact of higher volumes due to the improvement of the process on consumer uptake of switching. There is a high risk of volumes increasing, thus cost being in excess of this level. |
| **Annual operating cost** | **£4,297,991** | |

Using *Cost per productive minute* and basing it on market rates from outsourcers simplifies estimating the operational cost of a contact centre. Note that most outsourcers' *price per productive minute* is significantly lower than that achieved by, for example, public sector organisations. It includes a small margin, and normally 6-10% of price is net margin. We would regard any private sector organisation that delivers a cost per productive minute at 6% less than a best in class outsourcer's price as being exceptional.

### 4.4.3.1   Cost/Price per productive minute

As the Target Operating Model design assumes outsourcing, cost and price per productive minute have the same meaning. For our productive minute based costing we have drawn on two sources:

- Prices bid by outsourcers in competition for attractive opportunities; and
- A PwC model of costs using common benchmarks and market rates for labour, accommodation, ICT and other inputs. The model includes operational parameters such as ratio of supervisors to CSAs, space per person, quality control overhead.

*Price/cost per productive minute* is an all inclusive cost, covering inputs such as customer service advisors, supervisors, management, accommodation, voice and data ICT infrastructure and quality control (call monitoring etc.) It is derived from competitive procurement, which forces bidders to "lock" into their prices and take risk on key assumptions on utilisation, supervisor and management overheads etc. Benchmarks based on this kind of inclusive price data are market tested and are not prone to subjective application of benchmarks (for example, is the most appropriate supervisor/customer service advisor ratio 1:12 or 1:18 etc.)

A *productive minute* is a minute of productive contact centre work on customer contact (inbound/outbound call, email, white mail, chat, web processing, data entry etc). In practice this equates to "Average Handling Time" (itself the sum of time spent talking to a customer and subsequent time on after call work). It excludes idle time, sickness, training etc.

Cost per productive minute is sensitive to the:

- Nature of work – quality and competency required of the resource pool; and
- Service levels – access service levels to be delivered in operation.

#### 4.4.3.1.1.1   Nature of work

Our cost benchmarks cover both resources required for the execution of:

- *Simple:* discrete standalone tasks that do not involve analytical activities or require discretion on the part of a Customer Service Advisor in selecting options. This includes inputting data into a system that uses an algorithm that drives information or advice that is relayed to a Citizen; or
- *Complex:* process and scripts that are not simple, including processes that require analysis or unscripted investigation or probing, advocacy skills, and/or the selection of options that requires the execution of personal judgment or interpretation of rules, complex processes and simple processes.

Our assessment of the TPV requirement is that it is a simple process, and we have used the appropriate benchmarks in this regard.

#### 4.4.3.1.1.2   Service levels

There are two elements of service level operational requirements that impact cost:

- The aggressiveness of the target percentage of calls to be answered within "service level" – for example the percentage of call answered in, say, 10 or 20 seconds;
- Whether the target should be achieved in every period in the day (typically 15-30 minute intervals) or achieved as an average over the day – this latter element allows inferior service to be given during the busy hours of the day, while over performing in quieter periods, "summing" to a performance that meets the day's target.

In today's call centres, the emphasis has moved away from "best practice" of delivering an aggressive service level every hour of the day, to tolerating high abandoned rates and a variation in service level hour-by-hour as daily averages. However, for TPV, it is unlikely that such practices will be acceptable:

- Customers will already have queued for service;
- Abandonment while waiting for TPV may mean lost sales;
- The operational cost on warm handovers is very significant if CSA have to queue alongside customers; and
- While a variation in service level experience of customers dependent on time of day in initial access to the GP contact centre may be acceptable, having significant variations that lead to higher rates of customer calls lost during transfer during some periods of the day compared to others is not likely to be satisfactory for consumers or GPs.

Given this, our costings assume that:

- Less than 1% of callers abandon due to transfer to TPV services;
- 90% of calls are answered within 10 seconds of being placed in transfer queue; and
- This target is achieved consistently through the working day.

We have concluded that an appropriate estimate of cost per productive minute for the TPV is £0.48. Note this is significantly higher than a service with lower quality levels that are achieved on average over a day – if service levels were to be relaxed significantly, a competitive procurement could deliver a cost per productive minute of approximately £0.40-0.42 which are at the low end of our experience.

#### 4.4.3.1.2  Average Handling time

We have prepared a range of detailed scripts that we would expect customer service advisors to follow for the validation process, and timed how long it would take to execute these scripts, role playing the roles of calling customer and customer service advisor. These include:

- "Happy path", short, efficient and functional with no measures to manage customer experience;
- "Happy path", warmer call with measures to manage customer experience and deliver a good net promoter score; and
- Variations from the "Happy path" – cancellation, uncertain customers, issues requiring a search for data etc.

On this basis we have concluded that around four to five minutes is a reasonable estimate of the duration of a validation call, balancing the need to be functionally efficient with that of delivering a pleasant customer experience.

We have followed a similar approach to determine the duration of a cancellation call and we have concluded that around two to three minutes is a reasonable estimate of its duration.

### 4.4.3.2  Annual call volume

TPV service costs are highly sensitive to changes in the volume of calls processed by it. Calls comprise switching calls plus cancellation calls in those instances where the customer subsequently cancels the switch request.

We have based our central cost estimate on a total volume of 2.1m switching calls per annum, and an additional 0.3m cancellation calls, derived as follows:

- We estimated the switching calls using Ofcom published information on CP subscriber and churn data[6]. This approach is similar to the method adopted by CSMG, albeit based on more recent subscriber volumes. The resulting estimate of the annual number of switching calls is very similar (3% higher) to that used by CSMG. We therefore elected to adopt the same switching call volume as CSMG.

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[6] http://stakeholders.ofcom.org.uk/binaries/research/consumer-experience/tce-11/research_report_of511a.pdf;
http://stakeholders.ofcom.org.uk/binaries/research/cmr/Q4_2010.pdf; http://www.offta.org.uk/updates/otaupdate20110802.htm

- We estimate that 13% of switching calls are subsequently cancelled. This is based on the proportion of cancellations observed for the NoT process for the 12 months ended 31 March 2012 . This is much higher than CSMG's estimate of 7%, however, we are unable to ascertain how CSMG's cancellation percentage was derived.

There are considerable uncertainties in the forecast level of switching calls. The outturn level of switching is likely to be effected by various factors including:

- The introduction of the GPL TPV model is designed to facilitate customer switching and may be expected to drive higher switching volumes; and
- Changes in the portfolio of narrow and broadband services offered over Openreach copper may influence the level of inter-product switches.

## 4.4.4 How much will it cost to transfer callers and data to the TPV provider?

The table below summarises the annual cost of transferring callers and caller data from GPs to the TPV provider. These costs would be borne by the CPs.

*Table 31 Annual cost to transfer callers and data to TPV service provider*

| Driver | Value | Comment |
| --- | --- | --- |
| Transfer Cost per call minute | £0.03 | This is based on the capital cost of Call Centre infrastructure amortized over five years plus a voice call at approximate interconnect rates for a national call |
| Transfer Handling time | 60 seconds | This is based on an estimate of the time taken by a TPV customer care assistant to listen to a 14 digit reference number twice and key it into an IT system |
| Annual call volume | 2,101,913 | Estimated following the same method of CSMG |
| **Annual operating cost** | **£56,121** | |

Note it is assumed, in accordance with Ofcom/SWG, there is no 'business-as- usual' reason to transfer callers back from the TPV provider to GPs. If this were required, there would be extra cost.

### 4.4.4.1 Transfer Cost per call minute

Transferring calls will entail cost, as detailed in the table below.

*Table 32 Cost per minute – IVR infrastructure*

| Element | Unit | Comment |
|---------|------|---------|
| **Capital cost of 30 channels of Contact Centre capacity** | **£30,000** | **Based on prices of dedicated contact centre infrastructure for one 30 channel port of capacity,** |
| Amortized Capital cost of 30 channels of Contact Centre capacity | £7,500 | 5 year amortisation period |
| Maintenance cost per annum | £4,500 | 15% maintenance cost – industry norm |
| Annual cost | £12,000 | Total of cost above |
| Minutes used per annum | 720,000 | Assumes channel typical utilisation for peak demand to deliver 1:100 grade of service and minimal queuing for IVR infrastructure |
| Cost per minute – Voice ICT | £0.0167 | Derived from data above |
| Cost per minute – Telecoms | £0.0100 | Estimated cost using approximate interconnect rate rather than retail national call. |
| **Cost per minute – Total** | **£0.0267** | |

## 4.5 Costs to industry

In *section 3.1.4*, we discussed the impacts of the GPL TPV model on CPs and other industry players. In our scenario analysis, we have estimated the NPC of these impacts on the industry over a 10-year period to be between £41,781,000 and £77,587,000 , with a base scenario of costs amounting to £59,684,000 .

We provide in the table below a summary of our cost assessment. This summary is generated using a formula as follows:

[Cost to Industry] = [Cost to CPs] x [Number of CPs] + [Cost to TPIs] x [Number of TPIs] + [Cost to the Access and Wholesale Operators] x [Number of Access and Wholesale Operators].

*Table 33 Summary of total costs to the CP, Wholesale Providers, Access Operators and TPIs*

| Industry players | Element | Cost |
|------------------|---------|------|
| **Tier C CPs** | Capital cost | £3,246,943 |
| | Operational cost | £192,596 |
| | Number of Tier C CPs | 4 |
| **Tier B CPs** | Capital cost | £420,129 |
| | Operational cost | £81,798 |
| | Number of tier B CPs | 10 |
| **Tier A CPs** | Capital cost | £3,070 |

| Industry players | Element | Cost |
|---|---|---|
| | Operational cost | £1,754 |
| | Number of Tier A CPs | 287 |
| **Wholesale CPs and Access Operators** | Capital cost | £1,741,711 |
| | Operational cost | £29,000 |
| | Number of Wholesale CPs and Access Operators | 3 |
| **Full TPIs** | Capital cost | £2,194,467 |
| | Operational cost | £29,000 |
| | Number of Full TPIs | 5 |
| **Bureau Service TPIs** | Capital cost | £1,014,798 |
| | Operational cost | not applicable |
| | Number of Bureau Services TPIs | 6 |

The table below provides a total cost breakdown to the industry by activity area.

*Table 34 Breakdown by activity of total costs to industry*

| Element | Cost | Comment |
|---|---|---|
| a) Draft process and technology High Level Designs (HLD) | £3,147,123 | Complete and initial impact assessment identifying the detailed processes and technology functions which will be impacted by the introduction of the GPL TPV model. |
| b) Design and implement process change | £1,958,632 | Complete process changes required to pass customer to TPV service provider and integrate with Hub technology. |
| c) Conduct employees training | £6,311,172 | Train CSAs in new customer and fulfilment system changes. Provide training on the process changes themselves required to pass customer to TPV service provider and integrate with Hub technology. |
| d) Design and implement technology changes | £11,412,518 | Complete changes to CRM, customer and service order management systems, implement TxC changes to fulfilment systems and add new B2B interface to ServCo. Hub technology. |
| e) Perform data sanitisation prior to Initial Data Load | £528,518 | Conduct a validation and sanitisation of existing data according the API specified by ServCo. and perform the initial data load into the Hub. |
| f) Perform Pilot test with Hub | £1,772,263 | Conduct a pilot integrating processes and systems with the Hub using dummy service records and or a subset of data. |
| g) Test and Integrate Process Changes | £851,579 | Perform integration testing for all modified processes including full regression testing with existing related processes and systems. |
| h) System integration | £7,476,863 | Perform System Integration Testing (SIT), User Acceptance Testing (UAT) and |

| Element | Cost | Comment |
|---|---|---|
| testing | | Operational Acceptance Testing (OAT) of the end to end system. |
| i) Programme Management | £6,897,789 | Project and Programme management office for the duration of implementation. |
| **Total cost to integrate with GPL TPV Model** | **£40,356,000** | |

*Table 35 Total annual integration costs*

| Element | Cost | Comment |
|---|---|---|
| Annual cost for integration | £2,324,000 | Costs for supporting and maintaining B2B interfaces. Additional FTEs supporting Trouble-to-Resolve processes generated by GPs calling LPs to determine switch status and progress. |
| **Total** | **£59,684,000** | **NPC over a 10-year period (set-up costs plus annual costs over 10 years, discounted at 3.5%)** |

## 4.5.1 How much will it cost Communications Providers?

To determine the costs to CPs we have split costing into two areas:

### 4.5.1.1 People & Process

The proposed GPL TPV model will require CPs to make changes to a number of their core business processes. Introduction of third party verifications will require modification to most front office processes including Customer Order Management (COM) and Customer Problem Management (CPM).

Adopting a Transfer Code (TxC) to link switching service records to GPs and LPs will require modification throughout fulfilment. This will include changes to Service Order Management (SOM), Service Problem Management (SPM) and partner management processes to ensure that Hub database records match CP records at all times.

### 4.5.1.2 Technology

Changes to the COM and CPM processes will drive changes in a CPs CRM system and in CSA and Customer self-service interfaces. To interact with the Hub CPs must establish a new interface which matches an API defined by the Hub.

Implementation of the TxC requires a two way Business-to-Business link to facilitate the secure and reliable exchange of TxC between multiple service records and multiple parties. We have costed the provision of TxC and the Hub interface as a single workstream. This is based on the SWG use cases which stipulate that the TxC will be generated by the Hub itself so it will not be possible for any CP or wholesale operator to receive a TxC unless it has an interface with the Hub.

Other proposed SWG models propose alternative TxC implementations but these have not been costed as they are outside the scope of this report.

The cost of these changes will vary greatly between CPs depending on the size of the CP, their customer base, and the complexity and implementation of their IT systems. To determine an accurate cost we have defined 3 tiers of communications provider:

- Tier C - A CP who provides their own systems and own interfaces to EMP (to provision LLU and / or WLR3);
- Tier B - A CP of significant size who uses the services of TPIs to provide an interface to Openreach EMP and CRM / Billing systems;
- Tier A - Any remaining CP who uses the services of TPIs to provide an interface to Openreach EMP and CRM / Billing systems.

Tier C CPs will need to fund both People & Process and Technology changes. Tier B and Tier A CPs interface to Openreach via TPIs, and as such will not incur any technology costs.

Tier B CPs are expected to have adopted a considerably more robust business process framework which will require further modification and additional regression testing than is expected for Tier A CPs, who are likely to be more agile and be able to adopt the required process changes with less business impact.

Based on publicly available information, we have identified the following classifications of the 301 CPs[7] in the industry:

- 4 Tier C CPs – British Telecom, BSkyB, TalkTalk and Virgin Media;
- 10 Tier B CPs – O2, Orange, Kingston Communications, Zen Internet, Entanet, Demon, Plusnet, Tesco, Post Office, Primus Saver;
- 287 Tier A CPs – Any remaining CPs.

During our research we identified that some CPs may have chosen to differentiate consumer and business channels by implementing discrete technology systems to support each line of business. In these cases the front office changes required will need to be mirrored across both systems, which will have a resultant effect of doubling the cost impact.

We also identified that TalkTalk do use TPI services in some instances and Virgin Media has a lower percentage of their customers on the Openreach copper network compared to their own fibre network. For the purposes of costing these anomalies are considered to be cost neutral as the complexity and additional cost for CPs with multiple front office systems is expected to account for any reductions in costs to TalkTalk or Virgin Media.

We have made our classification based on investigation of the consumer market using publicly available information. Our investigation also served to highlight the rapidly changing nature of the fixed line and broadband market in the UK. For example, the introduction of EMP and WLR3, combined with the simplified adoption offered by TPIs, has enabled a large number of small niche providers to enter the market. Conversely the number of large CPs has reduced through a number of mergers and acquisitions which in some cases may result in a single commercial entity managing a number of discrete technology systems each with discrete interfaces to EMP. This complexity means that the true cost to any CP, even those in the same tier, may vary greatly, even by orders of magnitude. To provide a more accurate cost assessment requires a point in time study conducted with the full engagement of all CPs in the industry, and with Openreach, to understand the demographics of active CPs and their interactions with EMP.

### 4.5.1.3  How much will it cost Tier C Communications Providers?

The equation we have used is: [Cost to a Tier C CP] = [Cost of process changes] + [Cost of technology changes] + [On-going cost to operate].

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[7] Source: Ofcom

*Table 36 Capital costs to setup GPL TPV for Tier C CPs*

| Element | Unit (per CP) | Unit Cost | Total cost (all CPs in tier) | Comment |
|---|---|---|---|---|
| Evaluate process changes | 56 man-days | £710 | £158,961 | Undertake an impact assessment to understand which processes will be affected as a result of integration with ServCo. |
| Technology High Level Design (HLD) | 252 man-days | £710 | £715,326 | Conduct a High Level Design to identify the impacts and interfaces as a result of integration with ServCo. |
| Design changes to COM, CPM, SOM, SPM processes | 40 man-days | £710 | £113,544 | Design changes to Customer Order, Customer Problem, Service Order and Service Problem Management processes |
| Design, Code and Unit Test CRM and CO changes | 480 man-days | £710 | £1,362,526 | Complete changes to CRM, customer management systems. |
| Costs of new Hardware and Software | 4 | £145,000 | £580,000 | Costs to new hardware and software to support additional capacity in B2B systems interfaces. |
| Design, Code and Unit Test SO, TxC and B2B changes | 740 man-days | £710 | £2,100,561 | Complete changes to service order management systems, implement TxC changes to fulfilment systems and add new B2B interface to ServCo. Hub technology. |
| Conduct CSA training and employee awareness | 2,000 man-days  56 man-days | £439  £710 | £3,667,733 | Conduct training for Customer Sales Representatives in new customer order panels and customer transfer processes as a result of integration with TPV and Hub. |
| Data Sanitisation prior to initial data load | 60 man-days | £710 | £170,316 | Conduct a validation and sanitisation of existing data according the API specified by ServCo. and perform the initial data load into the Hub. |
| Pre-Hub Integration Pilot | 90 man-days | £710 | £255,474 | Conduct a pilot integrating processes and systems with the Hub using dummy service records and or a subset of data. |
| System Integration Testing | 686 man-days | £710 | £1,947,277 | Perform System Integration Testing (SIT), User Acceptance Testing (UAT) and Operational Acceptance Testing (OAT). |
| Implement changes to COM, CPM, SOM, SPM processes | 25 man-days | £710 | £70,965 | Implement new Customer Order Customer Problem, Service Order and Service Problem Management processes. |
| Project Management Office throughput the programme | 650 man-days | £710 | £1,845,088 | |
| **Total capital cost to integrate with GPL TPV Model** | | £12,987,772 | | |

*Table 37 Operational costs to setup GPL TPV for Tier C CPs*

| Element | Unit (per CP) | Unit Cost | Total cost (all CPs in tier) | Comment |
|---|---|---|---|---|
| On-going cost for managing switches | 373 man-days | £439 | £654,386 | Driven by additional FTEs supporting Trouble-to-Resolve processes generated by GPs calling LPs to determine switch status and progress. |
| On-going cost of B2B interface to Hub | 4 | £29,000 | £116,000 | Driven by additional software licences and hardware support as a result of new B2B interface systems. |
| **Annual operating cost to integrate with GPL TPV Model** | | | **£770,386** | |

#### 4.5.1.3.1 People & Process

The process evaluation is conducted in two workstreams; one analyst and one operations lead for front office; and one analyst and one operations lead for back office. The initial assessment will be conducted within one week, with a further week to integrate process impacts to the technology workstream. Finally within this phase stakeholder meetings will be completed to agree the project.

The design team will comprise one operations lead, and one operations analyst per workstream. The core team will take two weeks to complete the detailed design. Process testing will be conducted as part of the technology Systems Integration Testing and will include comprehensive regression testing to identify any issues on other CP and customer sales journeys. Upon completion of testing, the core process change delivery team will then spend a further one week implementing the process changes across the business.

To ensure successful implementation and the required customer experience following GPL TPV a training programme will be undertaken for each CSA in the CP. An employee awareness program will be run for the duration of the GPL TPV implementation, estimated at one day per week. Training programmes will be developed alongside process changes by a team of two trainers for two weeks.

Our knowledge of the industry suggests that larger CPs will have specialised CSA roles for switching. This may be a dedicated team, but is more likely to be a virtual team of individuals who have been trained in the switching process and switch scripts. To create an average for the size of these teams, hence the number or CSAs who will need training in new GPL TPV processes, we consulted three tier C CPs directly.

We identified that most sales related CSAs would require retraining in new GPL TPV model switching processes. As a result, a Tier C CP will typically have an average of 4,000 CSAs, with each CSA requiring ½ day training in new technology interfaces and process changes.

#### 4.5.1.3.2 Technology Costs and Programme Duration

CRM and Order Management changes will be run as two workstreams, each containing a team consisting of one Project Manager (PM), one architect, two developers and two analysts. For TxC and B2B interface changes there are a further two workstreams also containing one PM, one architect, two developers and two analysts. It is presumed that each workstream will require only one architect and one lead analyst during the HLD phase. The HLD for front office systems can be conducted in two weeks, whereas the more complex back office changes are likely to take one month, a further one week will be used to integrate all workstreams with each other and the business process changes.

Following the High and Low Level Designs, Code and Unit Testing (DCUT) phases will occur using all members of the workstream teams. DCUT for front office changes are expected to take two months. Back office changes

will follow a three month timescale plus an additional two weeks for two engineers to install and test the new server infrastructure required for additional capacity as a result of the B2B interface.

In parallel with the DCUT program for back office changes, a data sanitisation project must be started which culminates in the initial data load to the Hub. This project will verify the integrity of existing records, and will attempt to minimise errors resulting from the initial data load with the Hub. This project team will be made up of one PM, one lead analyst and three analysts for three weeks.

A pilot will be undertaken with a subset of CP data prior to the full system integration testing. The pilot team will comprise one test lead, one architect and one test designer / developer. This team will spend one week defining the scope of the pilot and will then be joined by three testers who will conduct the pilot for two weeks. The results of the pilot will be evaluated by the core team for a further one week. During the pilot phase support will be provided by the Hub to assist with boarding each CP. Some or all of the resources above may be provided by the Hub, however this is considered cost neutral so a more detailed breakdown has not been provided.

Following a successful pilot and DCUT phases the testing phase will begin. This follows a traditional software development lifecycle: test planning, System Integration Testing (SIT), User Acceptance Testing (UAT) and Operational Acceptance Testing (OAT). Each of these phases will last three weeks and will be conducted by a core team of two test designers/developers, four testers, one test lead, one architect and one PM.

Test support is provided by development resources on a decreasing scale as defects are reduced. Initially the resource team will have a similar size and workstream representation to the build team. This will scale down over the duration of testing to a minimal support team which will continue for the first month of go live. Based on our experience we believe this can be modelled as a resource profile of 10% of the total build effort.

For the nine month duration of the programme a Project Management Office will be created based on a core team of one project executive, one project clerk, one lead architect and one lead analyst.

### 4.5.1.3.3  On-going costs of integration

Two main factors drive on-going costs for Tier C CPs. Firstly, there is an additional software license and hardware support cost as a result of installing additional capacity into B2B interface systems; and, secondly, there is additional overhead managing issues during the switching process and data quality in the Hub. Beyond these costs, the front office and back office changes will not result in a net increase to service management or operational costs.

The GPL TPV model as prescribed by the SWG use cases will fundamentally change the ownership of the switching process. One of the consequences of this is that it becomes LPs responsibility to coordinate wholesale providers and access operators during a switch. It is expected that GPs will now contact LPs to obtain status updates; consequently an extra FTE has been included in a new switching Trouble-to-Resolve team, who will be responsible for escalations and issue resolution resulting from a consumer switch. Additional time will also be required to manage data quality of CP records stored in the Hub.

Automated test scripts will be created during the build project but time must be included to run these scripts and evaluate their output on a regular basis. We have based our analysis on BT's Operator and Emergency Assistance services, where CPs perform regular testing of their data records on the Trinity platform. We have included two days per quarter for this activity for tier C CPs.

We believe that there will be no incremental costs to the industry beyond the costs above; as all process and system changes are completed, their on-going support will be provided by the same teams as today. Although there are considerable upfront costs in establishing a new B2B interface, this provides benefits through on-going operational management.

A two way interface allows CPs to automatically update records in the Hub as their own records are updated. This requires that the API definition from the Hub allows regular record updates, for example when existing customers move house, change number or even when the CP changes the underlying access technology, (for example a move from WLR to MPF). We believe that the Hub API will be able to deliver this functionality, so

there will be limited requirements on CPs to manage data integrity in the Hub beyond the work performed on their own in-house systems.

### 4.5.1.4 How much will it cost Tier B Communications Providers?

The equation here is: [Cost to a Tier B CP] = [Cost of process changes] + [On-going cost to operate].

*Table 38 Capital costs to setup GPL TPV for Tier **B** CPs*

| Element | Unit (per CP) | Unit Cost | Total cost (all CPs in tier) | Comment |
|---|---|---|---|---|
| Evaluate process changes | 20 man-days | £710 | £141,930 | Undertake an impact assessment to understand which processes will be affected as a result of integration with ServCo. |
| Interface to TPIs regarding new technology requirements | 20 man-days | £710 | £141,930 | Changes to CP business process will drive technology changes in TPI which will drive negotiations and potentially new or modified sourcing contracts |
| Design changes to COM, CPM, SOM, SPM processes | 20 man-days | £710 | £141,930 | Design changes to Customer Order, Customer Problem, Service Order and Service Problem Management processes |
| Conduct CSA training and employee awareness | 500 man-days 28 man-days | £439 £710 | £2,391,684 | Conduct training for Customer Sales Representatives in new customer order panels and customer transfer processes as a result of integration with TPV and Hub. |
| Test changes to COM, CPM, SOM, SPM processes | 80 man-days | £710 | £567,719 | Perform integration testing for all modified processes including full regression testing with existing related processes and systems. |
| Data Sanitisation prior to initial data load | 15 man-days | £710 | £106,447 | Conduct a validation and sanitisation of existing data according the API specified by ServCo. and perform the initial data load into the Hub. |
| Pre-Hub Integration Pilot | 70 man-days | £710 | £496,754 | Conduct a pilot integrating processes and systems with the Hub using dummy service records and or a subset of data. |
| Implement changes to COM, CPM, SOM, SPM processes | 30 man-days | £710 | £212,895 | Implement new Customer Order Customer Problem, Service Order and Service Problem Management processes. |
| **Total capital cost to integrate with GPL TPV Model** | | **£4,201,289** | | |

*Table 39 Operational costs to setup GPL TPV for Tier B CPs*

| Element | Unit (per CP) | Unit Cost | Total cost (all CPs in tier) | Comment |
| --- | --- | --- | --- | --- |
| On-going cost for managing switches | 187 man-days | £439 | £4,201,289 | Driven by additional FTEs supporting Trouble-to-Resolve processes generated by GPs calling LPs to determine problems with switch status and progress. |

Costs for tier B CPs are driven by the same model as those for Tier C CPs, however by their partnership with TPIs tier B, CPs are only impacted by process changes.

### 4.5.1.4.1  People & Process

The process evaluation is completed in a single workstream with one analyst and one operations lead working one week, with a further week to develop a process implementation plan and integrate with TPIs. A further step, required by all CPs partnering with TPIs, is the evaluation and support of sourcing arrangements to support the GPL TPV programme. It is expected that a tier B CP will need two people for five days to provide support to new sourcing arrangements, and clarify required changes to the services they receive from TPIs.

The detailed process design team will comprise one project manager, one operations lead, and one operations analyst. The core team will take two weeks to complete the detailed design. This team will be joined by one test planner to conduct one week of test planning, after which two testers will conduct the testing for two weeks, which includes comprehensive regression testing, and interactions with the newly designed TPI systems, identifying any issues on other CP and customer sales journeys. Upon completion of testing the core process change delivery team will then spend a final week implementing the process changes across the business.

An employee awareness programme will be run for the duration of the GPL TPV model implementation consuming ½ day per week. Training programmes will be developed alongside process changes by a trainer for two weeks. Based on the same model developed for Tier C CPs, where CSAs adopt a specialist switching role, a tier B CP will typically have an average of 1,000 CSA which require training. This is driven from the CPs relative proportion of customers and the number of switches per annum. Each CSA will require ½ day training in new technology interfaces and process changes.

Despite their partnership with a TPI, all CPs remain responsible for their own data records and so must conduct a similar data sanitisation programme to Tier C CPs as part of their initial Hub data load. This project team will be made up of one project manager, two analysts and will run for one week.

Following the data sanitisation the CP is also expected to conduct a pilot phase. The pilot team will be composed of one test lead and one architect. This team will spend one week defining the scope of the pilot and will then be joined by two testers who will conduct the pilot for two weeks. The results of the pilot will be evaluated by the core team for a further one week. During the pilot phase support will be provided by the Hub to assist with boarding each CP. Some or all of the resources above may be provided by the Hub, however this is considered cost neutral so a more detailed breakdown has not been provided.

### 4.5.1.4.2  On-going costs of integration

As with Tier C CPs it is expected that GPs will now contact LPs to obtain status updates for any problems resulting from a switch in progress. Consequently, extra resource needs be included, which we have estimated as 1/2 a FTE, responsible for escalations and issue resolution resulting from a consumer switch. Additional time will also be required to manage data quality of CP records stored in the Hub. We have included one day per quarter to run scripted tests and evaluate the results.

### *4.5.1.5  How much will it cost Tier A Communications Providers?*

The calculation here is:[Cost to a Tier A CP] = [Cost of process changes]

*Table 40 Capital costs to setup GPL TPV for Tier A CPs*

| Element | Unit (per CP) | Unit Cost | Total cost (all CPs in tier) | Comment |
|---|---|---|---|---|
| Evaluate process changes | 2 man-days | £439 | £251,754 | Undertake an impact assessment to understand which processes will be affected as a result of integration with ServCo. |
| Conduct CSA training and employee awareness | 2 man-days | £439 | £251,754 | Conduct training for Customer Sales Representatives in new customer order panels and customer transfer processes as a result of integration with TPV and Hub. |
| Data Sanitisation prior to initial data load | 2 man-days | £439 | £251,754 | Conduct a validation and sanitisation of existing data according the API specified by ServCo. and perform the initial data load into the Hub. |
| Pre-Hub Integration Pilot | 1 man-days | £439 | £125,877 | Conduct a pilot integrating processes and systems with the Hub using dummy service records and or a subset of data. |
| **Total capital cost to integrate with GPL TPV Model** | | **£881,140** | | |

*Table 41 Operational costs to setup GPL TPV for Tier A CPs*

| Element | Unit (per CP) | Unit Cost | Total cost (all CPs in tier) | Comment |
|---|---|---|---|---|
| On-going cost for managing Hub data | 4 man-days | £439 | £503,509 | Driven by additional quarterly manual data validation checks of CP data in the Hub |

Costs for tier A CPs follow a similar model to those that applied for tier C CPs However, due to their size and agility, the impact of implementing these changes will be considerably less.

#### 4.5.1.5.1   People & Process

Process evaluation and design changes will be completed by two analysts for three days, with a further two days to develop a process implementation plan and integrate with TPIs.

CPs in Tier A have a variety of sizes and levels of relative complexity. This is also true for their number of CSA representatives. Many Tier A CPs may have a single CSA accepting calls; others, however, can have as many as 10 or 20. Some CPs outsource their call centre functionality to specialist providers to achieve economies of scale, whereby multiple CSAs will provide services to multiple CPs.

We do not expect that any CSAs supporting Tier A CPs will have a specialist switching role. As such, all CSAs supporting that CP must be trained. Our model for these CPs uses an averaged number of four CSAs across the tier. Each of these CSAs will receive ½ day for training in new technology interfaces and process changes.

Tier A CPs are still responsible for their own data records so will conduct data sanitisation programmes. This project team will be made up of one analyst and will run for one week during which time the CP will conduct their initial data load, and will perform some familiarisation with the portal. During this phase support will be

provided by the Hub to assist with boarding each CP. Some or all of the resources above may be provided by the Hub, however this is considered cost neutral so a more detailed breakdown has not been provided.

#### 4.5.1.5.2 On-going costs of integration

Although Tier A CPs will also be responsible for escalations and issue resolution resulting from a consumer switch, it is expected that the volume of additional work will be sufficiently low that it can be absorbed by existing employees. Additional time will also be required to manage data quality of CP records stored in the Hub. We have included one day per quarter to run manual tests and evaluate the results.

## 4.5.2 How much will it cost Wholesale Communications Providers, Access Operators and TPIs?

To understand the absolute costs to the industry we have also considered the costs of integration to GPL TPV for wholesale only communications providers, third party integrators and to Openreach as the access operator.

### 4.5.2.1 How much will it cost Wholesale Communications Providers and Access Operators?

In our analysis of the industry we identified 13 operators purchasing Local Loop Unbundling (LLU) services. Of these, most are local providers and hence are not considered to have a significant impact on cost. The exceptions to this are the four main communications providers: O2, C&W, TalkTalk and BSkyB. Of these, O2, TalkTalk and BSkyB all provide consumer services; as such even though some may also offer wholesale, their costs are considered in the CPs section above. This leaves C&W and BT Wholesale as the only two solely wholesale operators.

The costs incurred by Wholesale Operators and Access Operators have been generated using the same model, however there will not be any significant changes to any front office systems, as all the changes are from fulfilment variances, implementation of the TxC, and B2B interfaces to the Hub.

The calculation here is: [Cost to a WCP or AO] = [Cost of TxC and B2B technology changes] + [On-going cost to operate]

*Table 42 Capital costs to setup GPL TPV for Wholesale Operators and Access Operators*

| Element | Unit (per operator) | Unit Cost | Total cost (all operators) | Comment |
|---------|---------------------|-----------|----------------------------|---------|
| Technology High Level Design (HLD) | 132 man-days | £710 | £281,021 | Conduct a High Level Design to identify the impacts and interfaces as a result of integration with ServCo. |
| Costs of new Hardware and Software | 3 | £145,000 | £435,000 | Additional capacity in existing middleware interfaces to support additional B2B workload |
| Design, Code and Unit Test SO, TxC and B2B changes | 740 man-days | £710 | £1,575,421 | Complete changes to service order management systems, implement TxC changes to fulfilment systems and add new B2B interface to ServCo. Hub technology. |
| Pre-Hub Integration Pilot | 90 man-days | £710 | £191,605 | Conduct a pilot integrating processes and systems with the Hub using dummy service records and or a subset of data. |
| System Integration Testing | 638 man-days | £710 | £1,358,268 | Perform System Integration Testing (SIT), User Acceptance Testing (UAT) and Operational Acceptance Testing (OAT) |
| Project Management Office throughput the | 650 man-days | £710 | £1,383,816 | |

| Element | Unit (per operator) | Unit Cost | Total cost (all operators) | Comment |
|---|---|---|---|---|
| programme | | | | |
| **Total capital cost to integrate with GPL TPV Model** | | £5,225,132 | | |

*Table 43 Operational costs to setup GPL TPV for Wholesale Operators and Access Operators*

| Element | Unit (per operator) | Unit Cost | Total cost (all operators) | Comment |
|---|---|---|---|---|
| On-going cost of B2B interface to Hub | 3 | £29,000 | £87,000 | Driven by additional software and hardware licences as a result of new B2B interface systems. |

#### 4.5.2.1.1 People & Process

As they will not need to interface with the TPV process there will be no significant changes to the processes followed by wholesale or access operators. All the costs associated with adopting the GPL TPV model will be to do with technology , driven by the integration with TxC and also the creation of the new interface with the Hub.

#### 4.5.2.1.2 Technology Costs and Programme Duration

The costs to wholesale and access operators have been modelled using the same template as Tier C CPs except that no changes will be required to CRM or Customer Order systems. Following a project start-up phase for all team members, two workstreams will be run in parallel for TxC and B2B interface changes. The workstreams will each contain one project manager, one architect, two developers and two analysts. Each workstream will only need one project manager, one architect and one lead analyst during the HLD phase, which will take one month.

Design, Code and Unit Testing (DCUT) phases use all members of the workstream teams and will follow a three month timescale, plus an additional two weeks for two engineers to install and test the new server infrastructure required for additional capacity as a result of the B2B interface.

A pilot will be undertaken with a subset of provider data prior to the full data load and system integration testing. The pilot team will be composed of one test lead, one architect and one test designer/developer. This team will spend one week defining the scope of the pilot, and will then be joined by three testers who will conduct the pilot for two weeks. The results of the pilot will be evaluated by the core team for a further one week.

Testing follows a traditional software development lifecycle of; test planning, System Integration Testing (SIT), User Acceptance Testing (UAT) and Operational Acceptance Testing (OAT). Each of these phases will last three weeks and will be conducted by a core team of two test designers/developers, four testers, one test lead, one architect and one project manager.

Test support is provided by development resources on a decreasing scale as defects are reduced. Initially the resource team will have a similar size and workstream representation to the build team. This will scale down over the duration of testing to a minimal support team which will continue for the first month of go live. Based on our experience we believe this can be modelled as a resource profile of 10% of the total build effort.

For the nine month duration of the programme a Project Management Office will be created based on a core team of one project executive, one project clerk, one lead architect and one lead analyst.

#### 4.5.2.1.3  On-going costs of integration

To provide additional capacity in B2B interface an additional system has been installed, which results in additional software licenses and hardware support costs. Beyond these costs the changes will not result in a net increase to service management or operational costs, as such these will remain unchanged following completion of the GPL TPV programme.

### 4.5.2.2  How much will it cost Third Party Integrators?

Third Party Integrators may provide a number of different services to CPs. Our cost analysis is driven by the following classification of TPIs:

- Full TPI - TPIs providing both CRM and Billing Bureau Services and a WLR3 platform interface;
- BS TPI - TPIs providing CRM and Billing Bureau Services only.

Based on our investigations, and for the purposes of costing, we identified the following number of TPIs in the industry:

- 5 Full TPIs – Aurora Kendrick James, Singularity (now Kofax), Strategic Imperatives, Union Street Technology, and Vangent[8];
- 6  BS TPIs – Dataflow, Inform Billing, Shaftsbury Systems, TM Solutions, Ingeneering, Fintech Consultants.

We have made the simplifying and "low cost" assumption that telemarketers will use other parties' systems rather than develop their own solutions. There are several hundred telemarketers in the UK, some of which, for example Vangent, already supply solutions in this area.

Full TPIs will incur technology costs in line with a Tier C CP. They will be required to modify both their front office and fulfilment systems. Changes will be required to their CRM and billing implementations so they can continue to offer bureau services in line with CP requirements. They will also need to modify their customer order and service order interfaces to integrate with TxC and the B2B interface with the Hub, but will not incur any significant process change costs as these will be completed by the CPs themselves.

[Cost to a TPI] = [Cost of CRM and B2B technology changes] + [On-going cost to operate]

*Table 44 Capital costs to setup GPL TPV for Full TPIs*

| Element | Unit (per TPI) | Unit Cost | Total cost (all TPIs) | Comment |
|---|---|---|---|---|
| Technology High Level Design (HLD) | 252 man-days | £710 | £894,158 | Conduct a High Level Design to identify the impacts and interfaces as a result of integration with ServCo. |
| Design, Code and Unit Test CRM and CO changes | 480 man-days | £710 | £1,703,158 | Complete changes to CRM, customer management systems. |
| Costs of new Hardware and Software | 5 | £145,000 | £725,000 | Additional capacity in existing middleware interfaces to support additional B2B workload |
| Design, Code and Unit Test SO, TxC and B2B changes | 730 man-days | £710 | £2,590,219 | Complete changes to service order management systems, implement TxC changes to fulfilment systems and add new B2B interface to ServCo. Hub technology. |

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[8] Source: http://www.openreach.co.uk/orpg/home/products/wlr3/gettingstarted/tpi.do

| Element | Unit (per TPI) | Unit Cost | Total cost (all TPIs) | Comment |
|---|---|---|---|---|
| System Integration Testing | 686 man-days | £710 | £2,434,096 | Perform System Integration Testing (SIT), User Acceptance Testing (UAT) and Operational Acceptance Testing (OAT) |
| Pre-Hub integration pilot | 90 man-days | £710 | £319,342 | Conduct a pilot integrating processes and systems with the Hub using dummy service records and or a subset of data. |
| Project Management Office throughput the programme | 650 man-days | £710 | £2,306,360 | |
| **Total capital cost to integrate with GPL TPV Model** | | **£10,972,333** | | |

*Table 45 Operational costs to setup GPL TPV for Full TPIs*

| Element | Unit (per TPI) | Unit Cost | Total cost (all TPIs) | Comment |
|---|---|---|---|---|
| On-going cost of B2B interface to Hub | 5 | £29,000 | £145,000 | Driven by additional software and hardware licences as a result of new B2B interface systems. |

#### 4.5.2.2.1  People & Process

TPIs do not need to interface with the TPV process, so they will not incur any significant process change costs.

#### 4.5.2.2.2  Technology Costs and Programme Duration

The costs to TPIs have been modelled using the same template as Tier C CPs. Following project start-up for all team members, four workstreams will be run in parallel.

- For CRM and Order Management changes, there are two workstreams each containing a team consisting of one project manager, one architect, two developers and two analysts.

- For TxC and B2B interface changes there are also two workstreams, each containing one project manager, one architect, two developers and two analysts. Each workstream will require one architect and one lead analyst during the HLD phase. The HLD for front office systems can be conducted in two weeks, whereas the more complex back office changes are likely to take one month. A further one week will be used to integrate all workstreams and create an implementation plan.

- Design, Code and Unit Testing (DCUT) phases will use all members of the workstream teams. DCUT for front office changes will take two months. Back office changes will follow a three month timescale, plus an additional two weeks for two engineers to install and test the new server infrastructure required for additional capacity as a result of the extra capacity demand from the Hub B2B interface.

- The testing phase follows a traditional software development lifecycle of: test planning, System Integration Testing (SIT), User Acceptance Testing (UAT) and Operational Acceptance Testing (OAT). Each of these phases will last three weeks and will be conducted by a core team of two test designers/developers, four testers, one test lead, one architect and one project manager.

Test support is provided by development resources on a decreasing scale as defects are reduced. Initially the resource team will have a similar size and workstream representation to the build team. This will scale down over the duration of testing to a minimal support team, which will continue for the first month of go live. Based on our experience we believe this can be modelled as a resource profile of 10% of the total build effort.

For the duration of the programme a Project Management Office will be created based on a core team of one project executive, one project clerk, one lead architect and one lead analyst.

### 4.5.2.2.3  On-going costs of integration
To provide additional capacity in B2B interface, an additional system has been installed, which results in additional software licenses and hardware support costs. Beyond these costs the changes will not result in a net increase to service management or operational costs; as such these will remain the unchanged following completion of the GPL TPV programme.

### *4.5.2.3  How much will it cost Bureau Service Providers?*
BS TPIs will only incur the technology costs associated with front office systems. Changes will be made to CRM and billing implementations so they can continue to offer services in line with CP requirements. They will not incur any significant process change costs as these will be completed by the CPs themselves.

 [Cost to a BS TPI] = [Cost of CRM technology changes]

*Table 46 Capital costs to setup GPL TPV for Bureau Service Providers*

| Element | Unit (per BSP) | Unit Cost | Total cost (all BSPs) | Comment |
|---|---|---|---|---|
| Technology High Level Design (HLD) | 132 man-days | £710 | £562,042 | Conduct a High Level Design to identify the impacts and interfaces as a result of integration with ServCo. |
| Design, Code and Unit Test CRM and CO changes | 480 man-days | £710 | £2,043,789 | Complete changes to CRM, customer management systems. |
| Pre-Hub Integration pilot | 90 man-days | £710 | £383,211 | Conduct a pilot integrating processes and systems with the Hub using dummy service records and or a subset of data. |
| System Integration Testing | 408 man-days | £710 | £1,737,221 | Perform System Integration Testing (SIT), User Acceptance Testing (UAT) and Operational Acceptance Testing (OAT) |
| Project Management Office throughput the programme | 320 man-days | £710 | £1,362,526 | |
| **Total capital cost to integrate with GPL TPV Model** | | **£6,088,789** | | |

### 4.5.2.3.1  People & Process
As they will not need to interface with the TPV process there will be no significant changes to the processes followed by wholesale or access operators. All the costs associated with adopting the GPL TPV model will be related to technology.

#### 4.5.2.3.2 Technology Costs and Programme Duration

The costs to BS TPIs have been modelled using the front office elements of the Tier C CP build costs. Following a project start-up phase for all team members, two workstreams will be run in parallel. For CRM and Customer Order changes, the workstreams will each contain one project manager, one architect, two developers and two analysts. Each workstream will only need one project manager, one architect and one lead analyst during the HLD phase, which will take one month.

Design, Code and Unit Testing (DCUT) phases use all members of the workstream teams and will follow a two month timescale. Testing follows a traditional software development lifecycle of: test planning, System Integration Testing (SIT), User Acceptance Testing (UAT) and Operational Acceptance Testing (OAT). Each of these phases will last two weeks and will be conducted by a core team of two test designers/developers, four testers, one test lead, one architect and one project manager.

Test support is provided by development resources on a decreasing scale as defects are reduced. Initially the resource team will have a similar size and workstream representation to the build team. This will scale down over the duration of testing to a minimal support team which will continue for the first month of go live. Based on our experience we believe this can be modelled as a resource profile of 10% of the total build effort.

For the four month duration of the programme a Project Management Office will be created based on a core team of one project executive, one project clerk, one lead architect and one lead analyst.

#### 4.5.2.3.3 On-going costs of integration

The changes to CRM and Customer Order systems will not result in a net increase to service management or operational costs, as such these will remain the unchanged following completion of the GPL TPV programme.

In summary:

- The requirement to integrate with the GPL TPV model will be significant for the industry. Impacts, and therefore cost, are likely to be of a similar order of magnitude to integrating with Openreach Wholesale Line Rental 3 (WLR3) and EMP.
- Changes will be required to Customer Order and Customer Problem Management processes which will trigger similar technology changes in Customer Order Entry and Self-Management portals. Addition of the Transfer Code requires modification to service order processes and fulfilment systems.
- Data interchange between CPs and the Hub requires a new Business-to-Business interface to be established. Costs are driven by conformance to Hub API specifications, data sanitisation and regression testing.

# 5 Comparison of PwC and CSMG cost assessments

In this section we reconcile the results of the our cost assessment to those of CSMG and provide an explanation for the most significant areas of cost difference. We also provide a critique of the CSMG report, highlighting areas of the report that we believe require further analysis.

## 5.1 Comparing our findings with CSMG's

Our cost assessment presents substantial variance from that of CSMG.

In the figure below, we provide a breakdown of how our cost estimates compares with CSMG's independent TPV cost model.

*Figure 5-1 Comparison of our findings against CSMG's (10 year NPC with a discount rate of 3.5% applied)*
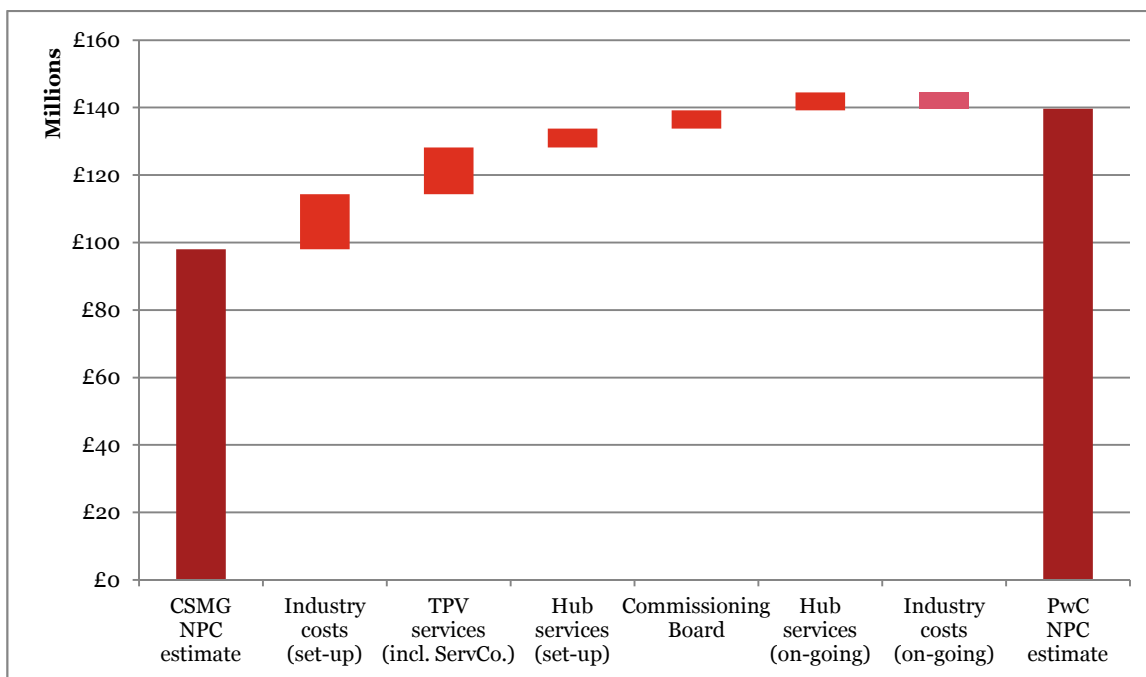


*Source: PwC*

Our explanation of the gap in the two cost estimates is structured in to six key areas of variation:

- *Industry costs (set up)* – this source of variance reflects the cost difference between our estimates and CSMG's for the costs incurred by industry players for preparing to interface with the GPL TPV model;
- *TPV services (including ServCo.)* – this source of variance reflects the cost difference in our estimates for TPV services and the cost of setting up and running ServCo.;
- *Hub services (set up)* – this source of variance reflects the cost difference between our estimates and CSMG's for setting up the Hub services;
- *Commissioning board* – this source of variance reflects differential cost estimations concerning the setting up of the programme that will lead to the launch of the GPL TPV model;
- *Hub services (on-going)* – this source of variance reflects the cost difference in our estimates for the on-going running the Hub services;

- *Industry costs (on-going)* – this source of variance reflects the cost difference in our estimates for the costs incurred by CPs for on-going interactions with the GPL TPV model.

In the table below, we provide an explanation for each of these six cost variances.

*Table 47 High level breakdown of cost variance (all figures are NPC over 10 year period)*

| Cost variance area | CSMG independent model | Our estimate | Variance | Explanation |
|---|---|---|---|---|
| ❷ Industry costs (set up) | £24,058,000 | £40,356,000 | £16,298,000 | Both models use similar approaches to identify areas of cost to CPs. Our estimate is based on their experience of delivering many projects of a similar size and scale. |
| ❶ TPV services (incl. ServCo.) | £40,843,000 | £54,286,000 | £13,443,000 | Variance is mostly driven by difference in annual cancellations volumes and assumed quality of TPV service providers |
| ❸ Hub services (set up) | £1,550,000 | £7,169,000 | £5,619,000 | We have used our experience of delivering many projects of a similar size and scale to determine the effort required.<br><br>To determine system requirements We have conducted a high level functional architecture design identifying target hardware and software requirements. |
| ❹ Commissioning Board (set up and on-going) | not applicable | £5,399,000 | £5,399,000 | CSMG appears to omit the governance and programme control required to deliver on time, quality and budget. |
| ❺ Hub services (on-going, 10 years) | £7,402,000 | £12,758,000 | £5,356,000 | Both models follow similar methods to calculate on-going Hub costs.<br><br>Variance is driven by higher capital costs. |
| ❻ Industry costs (on-going, 10 years) | £24,144,000 | £19,328,000 | -£4,816,000 | Our on-going industry costs are driven by two factors:<br><br>Additional maintenance and support for B2B interface capacity; and<br><br>Additional FTEs to support problems arising in LPs in managing the switching process.<br><br>CSMG has assumed 20% of capital build costs |
| **Total** | **£97,997,000** | **£139,296,000** | **£41,299,000** | |

## 5.1.1 Industry Costs (set up)

CSMG took two approaches to costing the impact upon industry: an independent assessment and an industry assessment, which we describe in *sections 5.1.1.1* and *5.1.1.2* below. Throughout this report, our comparison is made with the CSMG independent cost assessment.

### 5.1.1.1 CSMG Industry Model

In their industry assessment, CSMG surveyed CPs directly with a questionnaire. They received only five responses, which they used to generate a per subscriber rate. This rate was then apportioned across CPs based

on their number of subscribers to drive the total cost to the industry, yielding an industry cost of £37,280,000. This results in a significant variance to our own estimate of £3,076,000 which, while of a similar order of magnitude, is almost £13,000 lower. Over time, this comprises a material difference. We consider the variance between our approach and that adopted by CSMG is explained by the relatively small number of CP respondents in the latter case. Even ignoring statistical tests, using 5 CPs to extrapolate a cost per subscriber for the whole industry excludes several important behavioural considerations which are likely to affect CPs, such as:

- CPs who run parallel business and consumer systems (either as a result of mergers or business policy); or
- CPs which may need a new quotation capability within their customer order systems to handle the asynchronous nature of TPV authentication.

We identified that the largest item of cost will be in establishing new B2B interfaces to the Hub. We also identified that, in order for the transfer code to be processed and passed accurately, all parties involved in the back-end switching process must have a B2B interface with the Hub. Today this is managed via the Openreach Equivalence Management Platform (EMP). All CPs interface with EMP either directly or via TPIs. As such, in the new GPL TPV model, all TPIs will also be required to create a new B2B interface to the Hub to be able to continue to offer services to their customers. This will generate considerable additional costs and is the main reason for the variance between the CSMG industry and our model.

It is unclear how CSMG's per-subscriber based industry model has accurately captured the impact of the costs of creating B2B interfaces.

### 5.1.1.2 CSMG Independent Model

In their independent assessment CSMG, employed a similar approach to ours. We both used the TM Forum eTOM and TAM to identify common areas of processes and systems that industry players would need to change to effectively interact within the GPL TPV model. For each of the impacted areas, we both independently estimated costs for implementing the changes.

We have categorised the costs of system changes into front office and back office. Changes in the back office will deliver TxC and B2B interfaces for the new GPL TPV model, whereas front office will deliver changes required to customer order management systems.

The variance between CSMG's and our estimate of the costs of integrating the GPL TPV model for Tier C CPs primarily results from different assessments of the resource days required. For example, CSMG estimates that Tier C CPs will typically require 1,480 days of effort to implement the necessary changes to comply with the GPL TPV model, whereas our estimate amounts to approximately 2,220 days.

The variance between the two estimates is to be found predominately in the effort required for planning, design and testing activities. From a functional perspective, we have estimated that there is an increase in effort to accommodate the additional process steps required for the order to be validated by the TPV service provider before it proceeds.

In addition to the greater estimated effort required mentioned above, variance in the two cost assessments can be explained by a difference in allocating costs to TPIs. CSMG estimated that all TPI will incur costs at the same level as those incurred by tier B CPs. We have, however, also considered the additional cost to implement a new B2B interface to the Hub incurred by TPIs providing a platform to interface to EMP.

Our estimation of input costs is based upon our prior experience of similar change projects in these systems and considers all activities relating to a project of this nature where impacts on people, process and technology need to be considered.

Finally, to verify the robustness of our cost estimates, we conducted in-depth interviews with three Tier C CPs. During these interviews we checked that our approach considered all the potential areas of change, and validated our estimates based on CPs experience of similar projects such as the adoption of WLR3.

## 5.1.2 TPV services (including ServCo.)

The method we adopted for assessing the cost of providing TPV services is substantially different from the one employed by CSMG. As illustrated in section 3.1.3, we have identified the need for a ServCo. entity to direct and manage operational performance in service delivery, and to allow services to respond to change over time.

The handling of calls and on-line switches and cancellation requests is performed by an outsourced provider managed by ServCo. We were able to estimate the cost for procuring this type of services by reference to recent market prices we have obtained for analogous voice and non-voice customer contact services from a portfolio of leading UK outsource service providers.

CSMG has modelled the cost of providing TPV services on the basis of international TPV examples and, therefore, it has assumed that all costs (including those that we have identified as being incurred by ServCo., such as set up costs and management overheads) are included in the TPV services fees charged in these examples.

We estimate that the costs of TPV services are £13,443,000 (33%) higher than CSMG. This is, in part, attributable to a 6% difference in assumptions for the annual volume of switches arising from different approaches for quantifying switch cancellations. In addition to calls requesting a switch the TPV will also receive calls from customers who decide to cancel a previously initiated switch. CSMG estimated that 7% of switches would subsequently be cancelled but the source of this estimate is unclear. We estimated a cancellation rate of 13% based on the observed rate under the NoT process (across WLR and MPF products) for the year 2011/12 as provided by Openreach (see *Appendix C*). We regard NoT data as an appropriate proxy because of similarities between the GPL TPV model and the NoT process.

A like for like comparison with CSMG (adjusted for difference in inputs in annual volumes), reveals a difference of £3,637,000 (26%) in the NPC for TPV services over a 10 year period. We attribute this variance to a difference in assumptions concerning the required quality of TPV services. CSMG assumed that the abandonment rates and average speed to answer in its cost estimates are similar to those seen in international TPV examples. Their research suggests that the abandonment rate is approximately 5%, and the average speed to answer calls is approximately 25 seconds.

We consider these standards to be significantly below those required for a revenue-impacting function, such as TPV services. Setting the wrong standards level can increase the risk of revenue loss and can have a negative impact from a customer experience perspective. We would expect, on the basis of: (1) leading practice in sales function; (2) CP requirements to protect their sales revenue; and (3) in order to maintain an acceptable customer experience, that the abandoned rate due to TPV service levels to be significantly below 1%, a commonly accepted industry standard for sales contact centres.

It should be noted that the call and cancellation volumes employed in both our and CSMG's cost assessment are significantly lower than the volumes of switch orders estimated by Openreach and BT Wholesale for 2011/12, which amount to some 3.1m individual product switch orders (excluding bulk orders). This latter estimate is based on:

* 3.1m switch orders and 400,000 cancellation calls, for a total of 3.5m annual calls to the TPV services provider, representing a 47% increase on total call volume;
* This excludes switches currently carried out via the Cease and Re-provide process; and
* This also excludes switches of calls-only products.

We have, however, chosen the lower estimate of 2.4m call volumes (switch orders plus cancellations) because:

* Some of the 3.1m individual product orders identified by Openreach will have been multi-line orders, which would require only a single call to the TPV service provider, but these cannot be identified; and
* Up to 0.8m of the individual product orders will have been bundled as an order to switch WLR + SMPF, again only requiring a single call to the TPV service provider.

## 5.1.3 Hub Services (set up)

In the assessment of costs for set up of the central Hub, CSMG included 2,500 man days for build with an additional £200,000 for infrastructure costs. Within the CSMG cost model these figures are input estimate fields with the following explanation:

- *Man Days* – "Total programme man-days to deliver the Hub / TxCIA system (including Requirements Analysis, Design, Development, Testing, Implementation, Governance, Post-Launch Support)"
- *Infrastructure* – "Infrastructure requirements to cover five environments - Dev, Test, Pre-Prod, Prod and DR. Costs also cover the database licenses, backup drives for archiving, etc."

By comparison we have included programme management to ensure timely, compliant delivery and a series of clearly defined supporting workstreams. This requires 5,240 man days with an additional £2,745,623 for infrastructure costs. Our estimate of man-days has been based on our team's extensive experience of delivering projects of similar size, complexity and scale.

We provide below some examples:

- 1998 programme to support Ofgem regulatory objectives:

  - Central programme team of six full time for two years;
  - Central Design Authority – approximately 6-12 experts full time over two years;
  - Project teams within Public Electricity Suppliers – circa 1-2 full time managing PES programme, plus specialists supporting specific work streams (for example Legal and Commercial framework, implementing changes to PES systems, data cleansing, etc.);

- 2004 FSA "Mday" to deliver changes to customer notifications during sales and billing processes:

  - Small central team to support FSA;
  - Each retail bank and building society had a team to deliver process and technology changes to loan origination and servicing systems;
  - Barclays alone had a team of approximately 12 specialists working full time on the changes for c 2 years, excluding development work outsourced to India.

- Front office development for a major bank, requiring introduction of new middleware, change to processes and systems and new voice ICT to support changes to customer interface:

  - 15 month duration programme. Central programme team of three FTE;
  - Architecture design – Applications and Technology architects – two FTE for 15 months;
  - Voice ICT workstream – approximately 1.5 full time for nine months, with inputs bought from contact centre technology specialists, accounting for another circa three man years;
  - Data ICT workstreams – resource internally, but required dedication of two resource full time for 15 months;
  - Applications and middleware – approximately three specialists to support detailed definition of requirements, detailed design and run development activity;
  - Change management workstream – approximately three FTE for four months;
  - Training work package – six trainers for four months;

Our estimates for infrastructure have been built on a high level functional architecture, highlights of which have been included in *section 3.4.3.5. Information and Technology infrastructure*. This approach allows identification of target applications and target infrastructure to ensure Hub services delivers against the requirements as set out in the SWG use cases.

Our costs for purchasing network, server and storage infrastructure have been driven by list prices from Cisco and Oracle. License costs for target applications have been driven by costs from Oracle, Microsoft and Salesforce.com. Our estimate includes costs for a resilient production environment with a shared pre-production, development and test environment. Data centre costs are included based on a per kilowatt rate. Disaster recovery, backup and archive is included and provided through an outsourced contract.

### 5.1.4 Commissioning Board

In its independent assessment, CSMG estimated that the duration of the launch programme to set up the GPL TPV model will last 15 months. No reference was made by CSMG to costs associated with a central body commissioning and coordinating the programme across the industry.

As we illustrated in section 3.5, we have identified the need for a Commissioning Board to ensure an efficient delivery of a GPL TPV model and, once this is ready, to effectively manage and steer the activities of ServCo.

The full estimated cost of the Commissioning Board is, therefore, accounted as variance between our cost assessment and CSMG's.

### 5.1.5 Hub Services (on-going)

CSMG's model assumes a flat rate of 20% capital investment for operational cost. Our estimate is based on our experience of procuring ICT, the associated maintenance costs, and engineering overhead required to run operations. Hardware support and maintenance costs are based on Richard Webb's previous experience implementing hardware infrastructures to deliver IBM outsourcing contracts. Software license costs are based on published prices from Oracle, Microsoft and Salesforce.com. Ongoing IT service management and operational support has been costed based on David Costelloe's experience working for a provider of outsourced managed ICT services (Logicalis), and outsourcing project delivery, and has been modelled at 10% of build costs.

Our model includes costs to create and implement Hub services which will then enter operational life for 10 years. To address the typical five year useful life of IT hardware assets, we have included costs for a hardware refresh in year five. We have assumed that software will be kept within supported levels as part of the included maintenance provided by the outsource provider. We have not, however, included any potential reinvestment required to enhance or develop the Hub beyond day one.

To address any potential changes to features provided by the Hub during the 10 year duration it is expected that significant reinvestment will be required. The order of magnitude of these potential costs will vary greatly depending on the complexity of changes or additional features required.

It is possible that migrating software versions combined with significant feature enhancements could drive a similar timeline to the original Hub implementation, which will have a subsequently similar cost due primarily to the required software development, regression testing and data migration associated with complex changes. As a result of this potential variation in scale we have not included any costs for reinvestment beyond a five year hardware refresh in our base cost case.

Our approach is considerably more granular than CSMG's. Adopting a fixed percentage model, such as the one used by CSMG, does not accurately represent the drivers of cost, or the useable life of IT assets. Our functional architecture design provides a more accurate representation of the specific hardware and software support requirements and hence a more realistic estimate of costs. In contrast to CSMG, PwC's model takes into account the hardware reinvestment costs associated with a typical IT asset lifecycle used by outsourcing organisations. A fixed percentage model cannot transparently reflect these reinvestment requirements.

### 5.1.6 Industry Costs (on-going)

CSMG's model assumes a flat rate of 20% capital investment for operational cost. By comparison, our on-going industry cost estimates are driven by two factors:

* Additional maintenance and support for B2B interface capacity. In larger CPs, wholesale operators and TPIs we have included additional capacity in existing B2B interfaces. This drives associated annual costs for hardware and software maintenance ; and
* Additional FTEs to support problems arising in LPs in managing the switching process.

We believe that the SWG use case describes a back-end switching process which is owned by the LCP. As a result, in instances where problems arise during a switch, the GCP must contact the LCP to obtain an update. In the example of a transfer from WLR to MPF not occurring on the specified date, the GCP will have to contact

the LCP to find out why the switch did not occur. In tier C and tier B CPs this overhead is expected to be sufficiently large to warrant an increase in FTE.

# 6 Conclusions

In our cost assessment we have sought to define the entities and processes required to deliver the GPL TPV model, to a level of detail that would, from a procurement perspective, be sufficient for proposed vendors to bid against. Against this definition, we have used PwC comparative analysis, market knowledge and experience to develop our estimates of cost.

We have also identified the programme of activities required in the set up of the GPL-TPV model, using PwC's Transform method in order to provide a comprehensive list of tasks and then costs.

We have identified new entities that will need to be introduced under the GPL TPV model. These include a Commissioning Board and ServCo which will manage Hub and TPV services. In addition, industry players will need to make a number of changes to their processes and systems. We have conducted a detailed analysis of the cost drivers for each of these elements. The costs of each are shown in the table below.

*Table 48 Breakdown of GPL TPV set up and on-going costs (over 10 years)*

| Entities | Base case scenario |
|---|---|
| Commissioning Board | £5,399,000 |
| ServCo. | £9,806,000 |
| TPV | £44,480,000 |
| Hub | £19,927,000 |
| Industry players | £59,684,000 |
| **Total** | **£139,296,000** |

We estimate that, in the base scenario, the net present cost over 10 years to implement and operate on an on-going basis a GPL TPV model will be £158,579,279.

*Table 49 NPC for GPL TPV over a 5 and 10 year time frame*

| | Base case scenario | Low case scenario | High case scenario |
|---|---|---|---|
| 5 year | £103,550,000 | £68,548,000 | £142,376,000 |
| 10 year | £139,296,000 | £90,103,000 | £195,663,000 |

We have identified the following six reasons for the variance between our cost assessment and CSMG's:

- *TPV services (including ServCo.)* – there is a 6% difference in annual switches and cancellations volumes and assumed quality of TPV services provides

  - We have assumed that less than 1% of callers abandon due to transfer to TPV services and that 90% of calls are answered within 10 seconds of being placed in transfer queue;, while CSMG has

estimated the abandonment rate to be approximately 5%, and the average speed to answer calls to be approximately 25 seconds;

- *Industry costs (set up)* – there is a variance of £16,298,000 driven by difference in assumptions in the total amount of effort required to implement the changes;
- *Hub services (set up)* – there is a difference of £5,619,000 in the estimation of the capital required for Hub infrastructures and the effort to implement it;
- *Commissioning board* – CSMG's independent estimate did not contemplate the requirement for a Commissioning Board, this leads to an increment of our cost estimate of £5,399,000 ;
- *Hub services (on-going)* –both cost estimates are based on a percentage of the capital cost for setting up the Hub, therefore the £5,356,000 variance in this case is mostly a consequence of the fact that there is a cost variance in the set-up costs;
- *CPs costs (on-going)* – we have estimated that this cost area will be -£4,816,000 less; this is because the method we have followed to estimate this cost area is substantially different from CSMG's. On the one hand, our cost estimates account for additional maintenance and support costs for B2B interface capacity and additional effort to support problems arising in LPs in managing the switching process. CSMG, on the other hand, calculated this cost area by assuming 20% of capital build costs.

In conclusion our cost estimate of the NPC of the GPL TPV model over a 10 year period is substantially (42%) higher that CSMG's. This is because we have identified cost areas that were not included in the CSMG analysis (such as the Commissioning Board) and have gathered an evidence base of inputs used in our cost assessment that is at variance with those adopted by CSMG.

# Appendix A. - Our method for developing an independent cost assessment

In this section we describe the approach we have used to develop our independent cost assessment. We detail our TOM, Transform and IT frameworks that underpin our approach.

## A.1. Project approach

The figure below shows the five key steps we have followed in our approach to develop an independent cost assessment of the GPL TPV model.

*Figure 2 Our project approach*



*Source: PwC*

The table below details the key activities completed under each step in the project.

*Table 50 Key activities in project approach*

| Step | Purpose | Key activities |
| --- | --- | --- |
| Identify and specify design principle | To identify the key parameters that drive the design of the required TPV operation | We defined the high level organisation objectives, KPIs and required service levels; We identified the legal or regulatory constraints to be considered in the organisational design; We considered the high level sourcing structures for the operations. |
| Create blueprint for TPV operation: process, organisation and ICT | To define, at a high level, an exhaustive list of operational cost areas, such as people, processes, technologies, facilities and structure | We developed the high-level target operating model and enterprise architecture for ServCo. We identified, at a high-level, operational cost structures and areas for organisation structure, process/service delivery, governance, risk & control and technology. |
| Develop roadmap and gather input cost data | To clarify how the organisation will be set up and gather all cost information. | We explored and evaluated set up alternatives for ServCo. and the GPL TPV model (where no specific prescriptions were provided by Ofcom/SWG); We gathered input cost information from benchmarks and internal PwC data; We conducted meetings with a group of CPs to ascertain integration costs. We met with Ofcom to clarify whether their assumptions. |

| Step | Purpose | Key activities |
|---|---|---|
| Develop a cost model | To set up an excel model to analyse the costs to build, run and shut down the organisation. | We built the cost assessment model and conducted a scenario analysis;<br><br>We produced the first draft of the report. |
| Critique CSMG report & perform reconciliation analysis | To challenge the CSMG model based on an independent point of view of the costs required | We compare our cost evaluation with CSMG;<br><br>We reviewed and critiqued the CSMG report; |

# A.2. The PwC TOM framework

This section provides an overview of our Operating Model Framework (below) which we have used as a vehicle to assist our analysis of ServCo.'s operations.

We used this framework to break down ServCo.'s operations into discrete components, which we were then able to define and identify the corresponding costs. This approach helped us approach the design in a structured manner and to ensure completeness – that the organisation was well defined and all cost buckets captured.

*Figure 3 The PwC TOM framework*
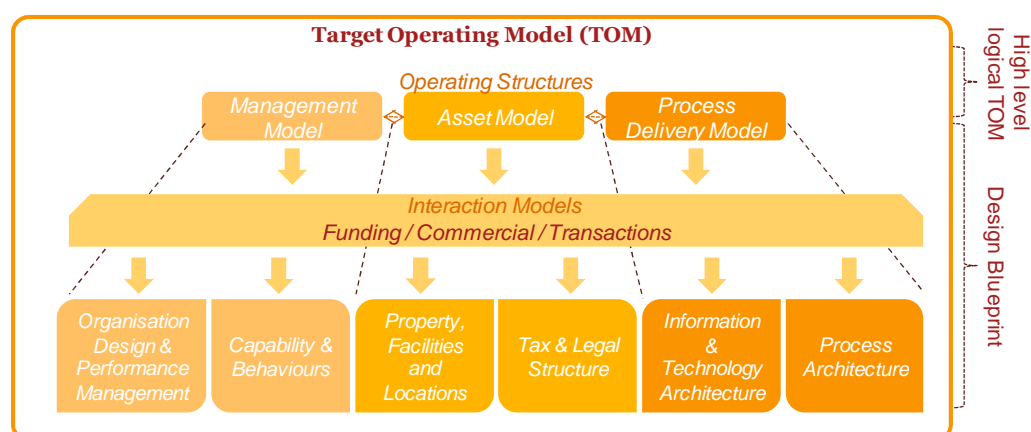


*Source: PwC*

We provide below a brief description of each of the elements that constitute the PwC TOM:

*Operating Structures* – consists of three models; the management model, asset model and process delivery model.

- The *Management model* defines what key decisions are made, how, where and by whom across the organisation.

- The *Asset Model* defines the ownership, location and controlling structures for the tangible and intangible assets and associated risks and liabilities across each component of the organisation. These assets could include:

    – People (management and staff);
    – Fixed assets (owned or leased);
    – Inventory and stock;
    – Customer and supplier relationships;
    – Alliance, JV, distributor, contract manufacturer, franchise relationships;

- – Intellectual property;
- – Booking and account structures; and,
- – Other investments.

- The *Process Delivery Model* defines what operational activities are executed where and by whom within the Operating Model.

  - – The activities, defined within the model, outline the day-to-day interactions a company has with its customers, employees and suppliers.
  - – This will include activities that are performed by third parties, for example where the processing of transactions has been outsourced.
  - – The procedures and controls linking these activities are formally defined by the Process Architecture and their execution governed by the policies and guidelines set by the leadership of the business to support the management model it defines.

*Interactions* – The interaction models establish where organisational activity and information flows exist, outlines where strategic value and profit is created and frames how the organisation is funded.

- The *Transactional Model* is an articulation of how the company actually works. It illustrates business flows and how businesses and functions within an organisation's Operating Model interact and hand off with one another.
- The *Commercial Model* defines where value or profit resides across the organisation and how the business, business partners, customers and suppliers are rewarded. The Commercial Model is closely linked to, and directly influences, the choice of tax reward model and Performance Management frameworks.
- The *Funding Model* defines the cash and funding structures in place to keep the organisation in business, it includes:

  - – External and internal funding strategies;
  - – Capital requirements / adequacy and gearing;
  - – Dividend policy;
  - – Investment and hedging strategies;
  - – Liquidity and cash concentration (in-house banking) strategies; and,
  - – Bank account and bank relationship structures.

*Infrastructure* – operationalising the business model requires infrastructure.

- The *Organisation Design* (OD) articulates how capabilities of the organisation will be grouped together. The OD will describe the way key roles and accountabilities are performed across the organisation via delegations, job descriptions and reporting lines.
- *Performance Management* describes the mechanisms and information required to govern, manage, and monitor the organisation, components of the organisation and individuals. At an organisational level it includes the detailed planning, forecasting & budgeting and reporting processes, the business rhythm (meetings and cycles), and the definition of key performance indicators and other management information (reports). At an individual level it includes the performance management process, individual targets and objectives, coaching relationships and incentive structures.
- The *Capability Strategy* assesses current capabilities and defines the future capabilities that people will need in order to perform their roles in the new organisation.
- *Behaviours* which builds on the Capability Strategy. It describes the behaviours and ways of working expected to be demonstrated by people in the organisation. The Competency Framework will be used to underpin people processes including recruitment, development, performance management and talent management.
- *Property, Facilities and Locations* includes the detail structure and configuration of offices, equipment and other physical (non IT) infrastructure assets required to operate.
- The *Tax and Legal Entity structure* describes the legal and fiscal responsibilities, structures and rules governing the business activities in each territory of operation.

- The *Information & Technology Architecture* describes the way technology and data is organised, deployed and used by the organisation. It describes what, where and how information is accessed to effectively plan, schedule, execute and monitor the business. It also includes a description of the business applications, data, technical interfaces, and infrastructure and Information System services.
- The *Process Architecture* describes in detail the way in which the organisation formally and informally executes and controls the operational activities. The Process Architecture includes end to end process maps spanning the business and functions throughout the organisation using standard process components.

# A.3. Transform

We have used Transform to support our activities-based approach to costing the set up of the GPL TPV model. We selected the relevant activities from the transform framework which then formed the basis of our set up cost estimates. This enabled us to make robust estimates of the time and effort required for each activity and helped to ensured that all costs are captured.

"Transform" is a PwC framework that provides a route map for implementing the strategic, people, process, technological, structural and facilities changes required to implement new or amended business strategies. We have used it successfully with public and private sector clients, to guide organisations through the design and implementation of major changes.

*Figure 4 Transform method diagram*
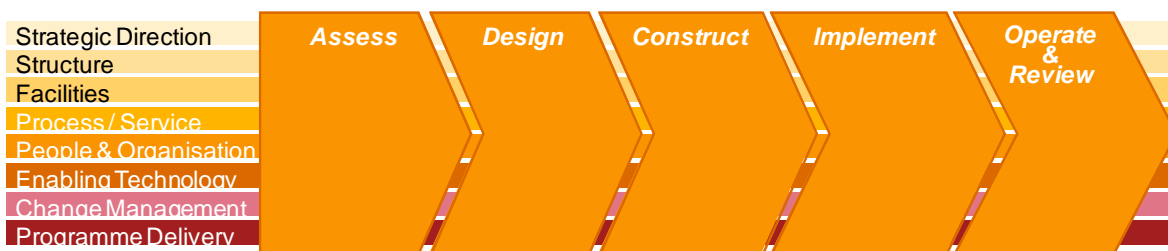


*Source: PwC*

The Transform Framework consists of five stages listed below. Each stage contains a number of related activities that need to be accomplished.

Strategy and Assess – used to confirm the organisation's business needs, to assess and select improvement opportunities;

Design – used to design the transformed organisation and to explore and develop the implementation strategies;

Construct – used to complete the detailed design of the transformed organisation and to prepare the detailed implementation plans;

Implement – used to implement the components of the transformed organisation and to prepare the detailed implementation plans;

Operate and Review – focuses on operating the transformed organisation, delivering the benefits and instigating a culture of continuous improvement.

# A.4. IT framework

The PwC Technology organisation framework provides a process-centric view of what is done in IT. We have used this framework in the future state design to support an activity based cost analysis – to ensure that all costs are captured and that the full range of activities are fully considered.

*Figure 5 PwC Technology Organisation Framework*
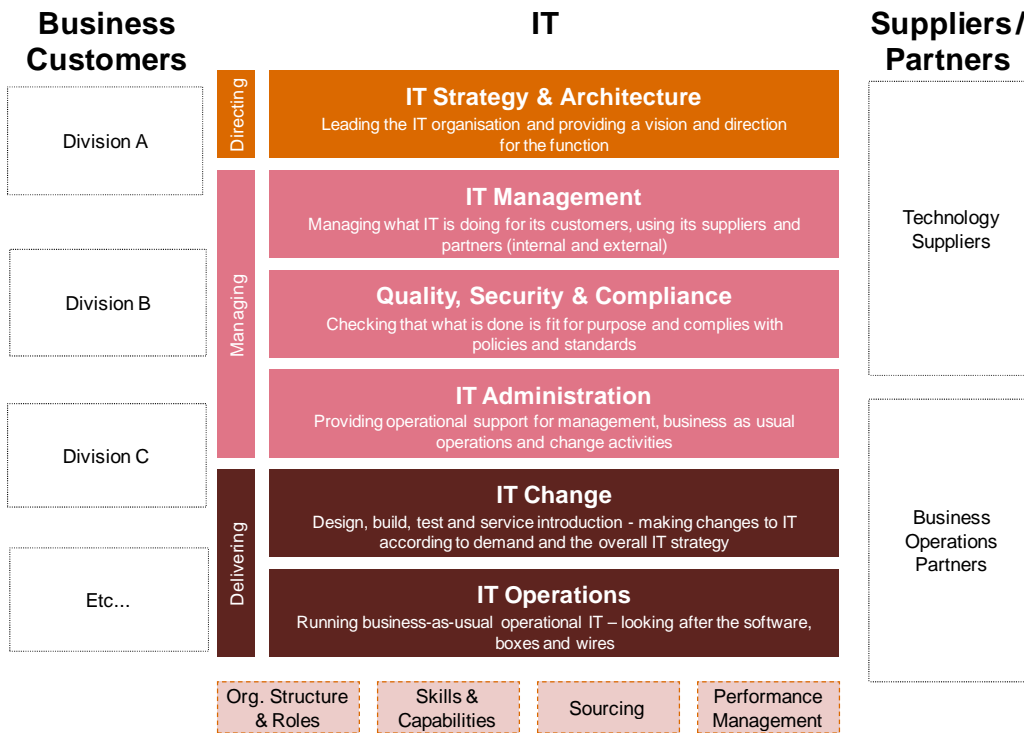


*Source: PwC*

This model provides a process centric view of technology within an organisation.

From this framework 26 IT functions are identified across each of the process domains.

*Figure 6 IT Strategy & Architecture Process Domains*



*Source: PwC*

Leading the IT organisation and providing a vision and direction for the function.

*Figure 7 IT Management Process Domains*

| 2.1 Business Relationship Mgmt. | 2.2 Demand, Capacity & Portfolio Management | 2.3 Staff Management & Supervision | 2.4 IT Financial Management | 2.5 Supplier Management |
|---|---|---|---|---|
| • Demand & expectation management<br>• High level requirements<br>• Pro-active advice<br>• Business education & training (opportunities from use of IT enablers)<br>• Communication<br>• Establishing service levels<br>• Measurement of SLA performance<br>• Escalation<br>• Continuous improvement | • Visibility of whole portfolio of change that includes IT<br>• Active management of identified projects and initiatives through to closedown<br>• Benefits management<br>• Staff capacity and capability planning (numbers and skills)<br>• Infrastructure capacity planning (e.g. network, storage, data centre capacity) | • Team leading and work supervision<br>• Operational decision making<br>• Task allocation / tactical workforce management | • Budget setting and management<br>• Financial forecasting | • Third party relationship management<br>• Vendor performance management<br>• Ongoing communication |

*Source: PwC*

Managing what IT is doing for its customers, using its suppliers and partners (internal and external.)

*Figure 8 IT Quality, Security & Compliance Process Domains*

| 3.1 IT Standards & Policies | 3.2 Information Assurance | 3.3 Security, Compliance & Accreditation | 3.4 Quality & Risk Management |
|---|---|---|---|
| • Managing current portfolio of policies, principles and standards<br>• End-user awareness and training<br>• Development / definition of IT processes | • Determining practices and procedures for Information governance<br>• Communications and providing information about Information governance | • Monitoring emerging regulations<br>• Impact analysis<br>• Managing compliance (internal and external regulations and policies)<br>• Dispensations<br>• Determining the security framework, policies, procedures and standards<br>• Security awareness<br>• Monitoring compliance<br>• Security accreditation | • Defining the Quality Management System<br>• Quality Assurance and Control<br>• Knowledge management<br>• Continuous improvement<br>• Defining risk appetite<br>• Identifying and evaluating risks<br>• Prioritising & planning mitigation and control activities |

*Source: PwC*

Checking that what is done is fit for purpose and complies with policies and standards.

*Figure 9 IT Administration Process Domains*

| 4.1 IT Finance (transactional) | 4.2 IT People Management & Resourcing | 4.3 IT Procurement & Contract Mgmt | 4.4 IT Management Info & Reporting |
|---|---|---|---|
| • Within budget period financial tracking<br>• Invoicing / payments<br>• Recharge / recovery<br>• Collation and issue of quotes for service<br>• Service request billing | • IT organisation structure<br>• Definition of roles & responsibilities<br>• IT skills & training<br>• Continuous professional development (incl. reviews / appraisals)<br>• Recruitment / dismissals<br>• Allocation of IT resources based on demand and priority<br>• Managing effective use of facilities (buildings, data centres etc.) | • Managing procurement processes (ITQ, RFP, ITQ, Competitive Dialogue, etc.)<br>• Purchase order / goods receipt<br>• Contact lifecycle management | • Definition of MI requirements<br>• Creating periodic and ad hoc reports<br>• Data analysis |

*Source: PwC*

Providing operational support for management, business as usual operations and change activities.

*Figure 10 IT Change Process Domains*

| 5.1 Design | 5.2 Build | 5.3 Test & Implement | 5.4 Managing Change |
|---|---|---|---|
| **Solutions Architecture**<br>• Solutioning<br>• Technical Architecture<br>• Liaison with business change teams (e.g. process design)<br>• Requirements management<br>**Business Analysis & Design**<br>• Process decomposition<br>• Process re-engineering<br>• Team / role design<br>• Functional requirements gathering<br>• Design documentation<br>**Systems Analysis & Design**<br>• Application, data and infrastructure assessment and design<br>• Technical requirements gathering<br>• Design documentation | **Specialist Apps, COTS Apps, Bespoke Apps**<br>• Development / configuration of new systems<br>• Changes to existing systems (e.g. upgrade, optimisation)<br>• Prototyping, proof of concept<br>• Detailed documentation<br>• Unit testing and technical fixes during subsequent testing<br>**Integration Development**<br>• Development / configuration of interfaces (batch, real time, web services, etc.)<br>• Extract Transform & Load (ETL) integration<br>**Infrastructure Development**<br>• Build and configuration of new or changing infrastructure components (e.g. servers, desktops, telecoms, networks, databases, storage, etc.)<br>**Report Development**<br>• Report creation (operational reporting, management information, ad hoc queries)<br>• Data mining / analysis<br>**Configuration Management (S/W)**<br>• Developing and maintaining code and configuration repositories<br>• Version management approach and methods | **Testing**<br>• Test strategy and standards<br>• Design, preparation and execution of all testing phases<br>• Test phase management<br>**Release Management & Service Introduction**<br>• Defining release strategy for change projects<br>• Detailed release activity task planning and mgmt.<br>• Service readiness and acceptance<br>• Service transition (incl. document reviews)<br>• Liaison with relevant business change teams | **Project & Programme Management**<br>• Defining project and programme management practices and standards<br>• PMO (incl. project admin support)<br>• Task allocation and progress management<br>• Risk and issue mgmt<br>• Project reporting<br>• Project status meetings<br>**Change Management**<br>• Change impact analysis (people)<br>• Communications<br>• People transition<br>• Training needs analysis<br>• Development of training materials and delivering training courses |

*Source: PwC*

Design, build, test and service introduction - making changes to IT according to demand and the overall IT strategy.

*Figure 11 IT Change Process Domains*

| 6.1 Application Support & Maintenance | 6.2 Server & Desktop Support & Maintenance | 6.3 Network Support & Maintenance | 6.4 Service / Help Desk | 6.5 Data Centre Ops & Data Mgmt. | 6.6 Disaster Recovery & Continuity |
|---|---|---|---|---|---|
| **Specialist Apps, COTS Apps and Bespoke Apps**<br>• Application support (3rd line)<br>• Application maintenance (daily checks, minor fixes or changes)<br>• Application upgrades / patches<br>• Preventative maintenance<br>• Documentation management.<br>• Application optimisation<br>• App. lifecycle mgmt (incl. Decommissioning) | • Server Support & Maintenance (e.g. upgrade/patch) - production and non-production environments<br>• Desktop, laptop, specialist workstations and Unix machine Support & Maintenance<br>• Printer and scanner hardware installation<br>• Printer, scanner, HFD, photocopier, etc. hardware installation and print server support<br>• IT Asset Management - refresh strategy and planning; managing asset lifecycles; developing & maintaining asset database; management of configuration of hardware & software (incl. licensing)<br>• Telephony & Mobile Devices Support & Maintenance<br>• Physical IT asset re-location<br>• Support for Facilities Management teams for desk and office move | **Data Network Support & Maintenance**<br>• Support and maintain all data networks<br>**Voice Network Support & Maintenance**<br>• Support and maintain voice networks (fixed line)<br>• Liaison with 3rd party telecoms providers (incl. mobile) – networks | **Service / Help Desk**<br>• Help Desk operations<br>• Problem management (full lifecycle)<br>• Service desk performance mgmt<br>• Day-to-day end-user assistance<br>**Incident Management**<br>• Prioritisation and allocation of incident response teams<br>• Incident troubleshooting and resolution<br>• Communications during major incidents<br>• Queue management<br>• 3rd party task assignment and liaison<br>**Provisioning (Catalogue Requests)**<br>• Maintenance of product / service catalogues<br>• Acceptance, approval and fulfilment of provisioning requests<br>• Inventory management and goods issue<br>• Request queue mgmt | **Data Centre Operations & Data Mgmt.**<br>• Data backup<br>• Data restoration<br>• Storage configuration<br>• Archiving (physical and electronic)<br>• Daily operational management of Data Centres<br>**Storage & Database Administration**<br>• SAN support and maintenance<br>• File server configuration support and maintenance (incl. capacity management)<br>• Database administration & support<br>**Security Operations**<br>• Management and maintenance of security infrastructure<br>• Access control<br>• Threat and vulnerability testing<br>• Managing security incidents<br>• eMail / web filtering | • Disaster recovery strategy and planning<br>• Business continuity strategy and planning<br>• Mitigation process, technology and people design<br>• Testing |

Source: PwC

Running business-as-usual operational IT – looking after the software, boxes and wires.

# *Appendix B. - Table of figures*

# *Appendix C. - Tables of inputs to cost evaluation*

*Table 51 Global inputs*

| Input | Value | Rationale |
|---|---|---|
| Scenario variance | 30% | For each value in our cost evaluation that is susceptible of variance (time, volume, value), we have modelled a +/- 30% variation on the expected value to build our worse/Low case scenarios respectively. We consider 30% to be a standard contingency assumption practice adopted when planning for this type of projects. |
| Social rate of time preference | 3.5% | |
| Management consultant daily rate | £1,550 | Based on a blended rate of various management consulting rates (undisclosed workings due to commercial sensitivity) |
| Industry FTE daily rate | £439 | Based on a £100,000 annual payroll cost per employee (including national insurance contributions, pension, benefits and other direct staff costs) |
| IT outsourced contractors daily rate | £800 | Based on an itjobswatch.com search where average UK contractor rates are between £1000 and £350 per day, and Offshore developer resource is approximately £25 per hour. With an 80/20 onshore/offshore split and adding 50% prime SI overhead. |
| IT delivery and CP FTE blended daily rate | £710 | A 3:1 IT contractor to CP FTE ratio is typically encountered in this type of projects |
| Members of the Commissioning Board daily rate | £658 | Based on a £150,000 annual payroll cost per employee (including national insurance contributions, pension, benefits and other direct staff costs) |
| CSA training cost | £400 | Based on a blended rate of various management consulting rates (undisclosed workings due to commercial sensitivity) |

*Table 52 Inputs – ServCo.*

| Input | Value | Rationale |
|---|---|---|
| **Recruitment** | | |
| Annual staff attrition rate | 15% | Web search: The UK average employee turnover rate is approximately 15% a year |
| Average recruitment cost per employee | £3,950 | Web source: The Recruitment and Employment Confederation - the average recruitment cost of filling a vacancy (using any method) is £3,950. |

| Input | Value | Rationale |
|---|---|---|
| **Personnel** | | |
| National insurance tax | 12.8% | |
| Staff benefits - Entertaining p/a | £130 | Assumed £80 per FTE per Xmas party + £50 per FTE over the course of the year for birthdays and informal rewards |
| Staff benefits - Health Insurance p/a | £500 | Web source: Personnel Today, estimated at £500 per employee per annum |
| Staff benefits - Pension (Defined Contribution Scheme) | 8.0% | £2,000 per employee p/a (based on an average salary of £25,000, with an 8% employer contribution) |
| Staff benefits - Work Insurance p/a | £70 | Web source: HR Magazine, estimated at £70 per employee p/a (based on an average salary of £25,000) |
| Training | £1,750 | a   Web source: Learning and skills council, published in Personnel Today - Average spend on training per capita (2007): £1,750 |
| **Office rental costs (per person per month)** | | |
| Exeter | £250 | |
| Southampton | £425 | Web source: Costs range £250-£750 per person per month depending on location |
| London and the South East | £750 | |
| **Other overheads** | | |
| Legal costs | £ 2,100 | Web source: The average annual bill was £2,100 in 2009. |

*Table 53 Inputs– Composition of industry players*

| Input | Value | Rationale |
|---|---|---|
| Tier A CPs | 287 | Any remaining CP which uses the services of TPIs to provide an interface to Openreach EMP and CRM / Billing systems - This number is taken from Ofcom and mirrors the CSMG report. |
| Tier B CPs | 10 | A CP of significant size who uses the services of TPIs to provide an interface to Openreach EMP and CRM / Billing systems - Orange, O2, Kingston Communications, Zen Internet, Entanet, Demon, Plusnet, Tesco, Post Office, Primus Saver |
| Tier C CPs | 4 | A CP who provides their own systems and own interfaces to EMP (to provision LLU and / or WLR3) - BT, BSkyB, TalkTalk (note, TT also use TPIs in some instances), Virgin Media |
| Percentage of market owned by Tier C CPs | 86% | Ofcom market data tables q3 2011 |
| Percentage of market owned by the 2 main tier B CPs | 7% | Ofcom market data tables q3 2011 |
| Estimated percentage of market owned by other Tier B CPs | 3% | PwC assumption |
| Number of switches per year per Tier C CP | 561,600 | Based on c2M switches per year, Ofcom data shows Tier C CPs |
| Number of switches per year per tier B CP | 27,040 | Based on c2M switches per year, Ofcom data shows Tier C CPs |
| Estimated CSA Salary | £30,000 | |
| **Cost per productive minute** | **£0.48** | |
| Average switch Handling time (seconds) | 900 | Estimate an average switch takes 15 minutes |
| Estimated additional members in Tier C CP switching team beyond core capacity | 150% | Estimated number of additional CSAs who will be trained to manage capacity within the switching team, expected to be a switching specialist not be a dedicated resource to manage capacity |
| Estimated cost of switching for Tier C CSAs | £4,043,520 | Based on number of switches a year |
| Number of dedicated switching Tier C CSAs | 202 | |
| Estimated additional members in Tier B CP switching team beyond core capacity | 300% | Estimated number of additional CSAs who will be trained to manage capacity within the switching team, expected to be higher than Tier C as the switching team will not be a dedicated resource but will be a proportion of trained CSAs |
| Estimated cost of switching for Tier B CSAs | £194,688 | Based on number of switches a year |
| Number dedicated switching Tier B CSAs | 19 | Remaining number of switches |
| Tier A CSAs | 4 | This is an average based on some small CPs who may only have 1, whilst some larger Tier A CPs may have 20+ all of |

| | | whom need training as there will not be specialist teams |
|---|---|---|
| Wholesale Communications Providers and Access Operators | 3 | BT and C&W (Entanet included in Tier B), includes Openreach |
| Third Party Integrators | 5 | 5 TPIs providing both CRM and Billing Bureau Services and a WLR3 platform interface - Aurora Kendrick James, Singularity (now Kofax), Strategic Imperatives, Union Street Technology, Vangent - (source "http://www.openreach.co.uk/orpg/home/products/wlr3/gettingstarted/tpi.do#List%20of%20Third%20Party%20Integrators") |
| Bureau Service Providers | 6 | 6 TPIs providing CRM and Billing Bureau Services only - Dataflow, Inform Billing, Shaftsbury Systems, TM Solutions, Ingeneering, Fintech Consultants |
| Number of Middleware Servers | 1 | Based on PwC experience of proposed HW environment |
| Middleware HW costs | 45,000 | Sun T4-2 server - https://shop.oracle.com/pls/ostore/f?p=dstore:product:4495289510664505::NO:RP,6:P6_LPI,P6_PROD_HIER_ID:1143346030243719074468856,11433460513874190736787 3 |
| Middleware Servers Maintenance | 20% | Based on PwC experience of proposed HW environment |
| Weblogic Software per processor licenses | 4 | Number of Processors in Sun T4-4 |
| Weblogic Software Maintenance | 20% | Based on PwC experience of proposed HW environment |
| Oracle Weblogic list price per processor | 25,000 | http://www.oracle.com/us/corporate/pricing/price-lists/index.html |
| Capital cost for SW and HW | 145,000 | Ofcom market data tables q3 2011 |
| On-going support costs for SW and HW | 29,000 | Ofcom market data tables q3 2011 |

*Table 54 Inputs - Hub services*

| Inputs | Value | Rational |
|---|---|---|
| Internet Installation Charges | 15,000 | Based on PwC's experience of installing similar services |
| Internet Rental Charges PA | 30,000 | Based on PwC's experience of installing similar services |
| Number of Firewalls | 4 | Based on PwC experience of proposed HW environment |
| Firewall Hardware | 15,000 | Based on list price for Cisco ASA 5550 bundle - https://apps.cisco.com/qtc/config/ICITServlet |
| Firewall Maintenance | 20% | Based on PwC experience of proposed HW environment |
| Number of Load Balancers | 2 | Based on PwC experience of proposed HW environment |
| Load Balancing | 25,000 | Based on list price for Cisco ACE30 - https://apps.cisco.com/qtc/config/ICITServlet |
| Load Balancers Maintenance | 20% | Based on PwC experience of proposed HW environment |

| Inputs | Value | Rational |
|---|---|---|
| Number of LAN Switches | 2 | Based on PwC experience of proposed HW environment |
| LAN and internal Firewalls | 65,000 | Based on list price for 6509 - https://apps.cisco.com/qtc/config/ICITServlet |
| LAN Switches Maintenance | 20% | Based on PwC experience of proposed HW environment |
| Number of Middleware Servers | 3 | Based on PwC experience of proposed HW environment |
| Middleware HW costs | 45,000 | Sun T4-2 server - https://shop.oracle.com/pls/ostore/f?p=dstore:product:44 95289510664505::NO:RP,6:P6_LPI,P6_PROD_HIER_ID :114334603024371907446856,11433460513874190736787 3 |
| Middleware Servers Maintenance | 20% | Based on PwC experience of proposed HW environment |
| Number of DB Servers | 2 | Based on PwC experience of proposed HW environment |
| DB Server Costs | 65,000 | Sun M4000 server - https://shop.oracle.com/pls/ostore/product?p1=SPARCEn terpriseM4000Server&p2=&p3=&p4=&sc=ocom_mseries _sparcenterprisem4000server&tz=1:00 |
| DB Servers Maintenance | 20% | Based on PwC experience of proposed HW environment |
| Number of Storage Subsystems | 1 | Based on PwC experience of proposed HW environment |
| Storage + SAN Costs | 200,000 | Estimated costs for subsystem - for example IBM XIV |
| Storage Subsystems Maintenance | 20% | Based on PwC experience of proposed HW environment |
| Number of Ancillary Servers | 7 | Based on PwC experience of proposed HW environment |
| Infrastructure Servers | 3,000 | Estimated costs a based on PwC's experience |
| Infrastructure Server Maintenance | 20% | Based on PwC experience of proposed HW environment |
| Ancillary IT costs, Racking | 10,000 | Estimated costs a based on PwC's experience |
| Ancillary Hardware Maintenance | 20% | Based on PwC experience of proposed HW environment |
| Weblogic Software per processor licenses | 4 | Number of Processors in Sun T4-4 |
| Weblogic Software Maintenance | 20% | Based on PwC experience of proposed HW environment |
| Oracle Weblogic list price per processor | 25,000 | http://www.oracle.com/us/corporate/pricing/price-lists/index.html |
| Oracle DB Software per processor licenses | 8 | Number of Processors in Sun M4000 |

| Inputs | Value | Rational |
|---|---|---|
| Oracle DB Software Maintenance | 20% | Based on PwC experience of proposed HW environment |
| Oracle Enterprise Edition list price per processor | 47,000 | http://www.oracle.com/us/corporate/pricing/price-lists/index.html |
| Salesforce.com users | 110 | Number of sales representatives in TPV |
| Salesforce.com portal users | 301 | A Portal license per CP to allow B2B exchange - pending EMP numbers |
| Salesforce.com License price per user per month | 85 | http://www.salesforce.com/uk/crm/editions-pricing.jsp |
| Salesforce.com Portal license price per user per month | 15 | https://login.salesforce.com/help/doc/en/users_understanding_license_types.htm |
| Salesforce.com PA Cost | 166,380 | |
| NetSuite ERP users | 15 | Estimated number of licenses based on size of TPV and Managers in ServCo |
| NetSuite ERP License base cost per month | 400 | http://www.crmexposed.com/compare-netsuite-products-pricing.php |
| NetSuite ERP License price per user per month | 100 | http://www.crmexposed.com/compare-netsuite-products-pricing.php |
| NetSuite ERP PA Cost | 22,800 | |
| Sharepoint / Office 365 Users | 127 | 1 License for all staff in ServCo |
| Office 365 licenses per user per month | 13 | http://www.office365advantage.co.uk/about-office-365/office-365-pricing/Pages/default.aspx |
| Office 365 PA Cost | 20,193 | |
| Total cost of Hardware Capex | 781,000 | |
| Total cost of Software Capex | 1,261,373 | |
| Dev / Test HW costs | 323,000 | Assuming N+1 of production environment |
| Dev / Test HW Maintenance | 20% | Based on PwC experience of proposed HW environment |
| Dev / Test SW costs | 476,000 | Assuming N+1 of production environment |
| Dev / Test SW Maintenance | 20% | Based on PwC experience of proposed HW environment |
| PA Cost of Hardware Maintenance | 241,800 | |
| PA Cost of Software Maintenance | 399,773 | |
| 1x Architect, 1x PM, 2x Platform, 2xApp, 1x Dev | 7 | |
| 1 month Duration | 20 | Based on our experience of delivering similar IT projects of a similar scale |
| Cost of BCP Creation and DR testing | 140,000 | |

| Inputs | Value | Rational |
|---|---|---|
| Percentage of Capex for DR contract | 25% | Based on PwC experience of proposed HW environment |
| PA Cost of DR Contract | 195,250 | Based on PwC experience of proposed HW environment |
| Number of Racks | 3 | Based on PwC experience of proposed HW environment |
| Number of Kilowatts per rack | 6 | Based on PwC experience of proposed HW environment |
| Data centre electricity inclusive price per KW | 2,500 | Based on PwC's experience of installing similar services |
| Data centre costs PA | 45,000 | |
| Estimated amount of data to be backed up in GB | 6,978 | 33M lines, + 20M BB across an estimated 8 tables with each record consuming 100KB. Plus 200GB per system |
| Percentage of data change | 2% | Percent of data change |
| Daily amount of data to be backed up in GB | 140 | |
| Incremental daily backup total PA | 50,937 | |
| Total data backup PA | 134,668 | Assuming monthly full backups |
| Number of copies to be stored | 3 | |
| Estimated year-on-year growth | 1 | |
| Price per GB for Backup services | 2 | Based on PwC's experience of installing similar services |
| Backup costs PA | 323,204 | |
| Service Management and Systems support costs PA | 12% | Based on PwC's experience of implementing similar services |

*55 Inputs – TPV services*

| Inputs | Value | Source |
|---|---|---|
| Number of switches per year | 2,101,913 | Estimated following the same method of CSMG |
| **Number of cancel per year** | **273,249** | **Based on the on a blended rate of cancel call volume for NoT process (provided by Openreach for the year 2011/12)** |

# *Appendix D. - Glossary of terms*

A glossary of abbreviations and key terms used in this document.

*Table 56 Glossary of abbreviations*

| Abbreviation | Term |
| --- | --- |
| ACD | Automatic Call Distributor |
| AO | Access Operator |
| API | Application Programming Interface |
| BAU | Business as Usual |
| BC | Business Continuity |
| BRA | Business Requirements Analysis |
| BT | British Telecom Plc |
| B2B | Business to Business |
| CLI | Customer Line Identification |
| COM | Customer Order Management |
| CP | Communications Provider |
| CPM | Customer Problem Management |
| CSA | Customer Service Advisor |
| CTI | Computer Telephony Integration |
| DCUT | Design Code and Unit Testing |
| DR | Disaster Recovery |
| EAI | Enterprise Application Integration |
| EI | Enterprise Integration |
| EMP | Equivalence Management Platform |
| ESG | Executive Steering Group |
| ETC | Early Termination Charge |
| eTOM | Enhanced Telecoms Operation Map |
| FTE | Full Time Equivalent |
| GCP | Gaining Communications Provider |
| GP | Gaining Provider |

| Abbreviation | Term |
| --- | --- |
| GPL | Gaining Provider Led |
| GPL TPV | Gaining Provider Led Third Party Verification |
| HLD | High Level Definition |
| HR | Human Resources |
| HW | Hardware |
| ICT | Information & Communication Technology |
| IT | Information Technology |
| IVR | Interactive Voice Response |
| JV | Joint Venture |
| LP | Losing Communications Provider |
| LP | Losing Provider |
| LPL | Losing Provider Led |
| MAC | Migration Authorisation Code |
| NoT | Notice of Transfer |
| NPC | Net Present Costs |
| OAT | Operational Acceptance Testing |
| OD | Organisation Design |
| PA | Per annum |
| PMO | Project Management Office |
| PwC | PricewaterhouseCoopers |
| RFI | Request for Information |
| RFP | Request for Proposal |
| SIT | System Integration Testing |
| SLA | Service Level Agreement |
| SOM | Service Order Management |
| SPM | Service Problem Management |
| SW | Software |
| SWG | Switching Working Group |
| TAM | Telecom Applications Map |

| Abbreviation | Term |
| --- | --- |
| TOM | Target Operating Model |
| TPI | Third Party Integrator |
| TPV | Third Party Verification |
| TxC | Transfer Code |
| UAT | User Acceptance Testing |
| USN | Unique Service Number |
| WCP | Wholesale Communications Provider |

# *Appendix E. - Sourcing matrix*

Below we provide our analysis o the alternative sourcing options we have identified. This forms the basis for our selected solution discussed in *section 3.4.1.4.1* (*Sourcing model*).

The elements coloured in pink and orange are deemed to be unsuitable and neutral respectively. Those in green represent the options that we feel provide the best cost performance or are required due to other criteria for example Data protection.

*Figure 6-11 GPL TPV sourcing matrix*

| The primary sourcing options are for HUB, Call Centre and the TPV Enterprise itself | | | **Sourcing Provisioning** | | | |
|---|---|---|---|---|---|---|
| | | | **In-House** – hardware, applications, maintenance and support provided by TPV | **Infrastructure Outsourcing** – managed hardware, maintenance, and support provided as a service | **Outsourced Managed Service** –managed H/W, apps, maintenance and support | **Cloud Sourced** – SaaS, PaaS, IaaS |
| **Sourcing Location** | **Onsite** – TPV owns its own premises. | **Hub** | Additional skills and resources required to run what is a standard process driven business | This is likely to be costly as TPV has its own premises which is potentially one of the higher cost items. | | |
| | | **Call** | | | | |
| | | **TPV** | The TPV business rents or buys its own premises and provides all services in house for all core staff. This is likely to be costly considering the level of services required | Leasing of End User H/W is unlikely to leverage too many benefits over an in house solution | Outsource the auxiliary End User services to UK based provider | Cloud sourced IT services such as office 365, but these are unlikely to be hosted onsite |
| | **Onshore** - This option implies TPV owns and runs from another UK based premises. This could be via a standard co-lo or work area provider, or possibly via leasing space in Ofcom or a CSPs offices / DC. | **Hub** | This is an option but it is unlikely that the TPV maintaining hardware and applications itself will be the most cost effective | This option implies TPV still needs to manage applications which will still imply IT skills and cost | This is the most likely option for the HUB due to personal data ownership | Considering the level of personal data cloud sourcing not an obvious choice |
| | | **Call centre** | | | Given the level of hardware investment a fully managed call centre service is likely to be the most cost effective option | There is potential to cloud source the call centre but these technologies are maturing, given the level of service required this is not really a option |
| | | **TPV** | The TPV rents space in an existing premises, and provides all its own services. Although facility costs are removed auxillery support costs will likely be high | Leasing of End User H/W - provides little benefit over hardware ownership | Outsource the auxiliary End User services - Possibly the most applicaable to TPV enterprise but likley to be more expensive than cloud sourcing | Cloud sourced IT services such as office 365, also potential to cloud source HR and finance functions togteher with an onshore office facility |
| | **Nearshore** – TPV runs from a lower cost European location | **Hub** | This is an option but it is unlikely that the TPV maintaining hardware and applications itself will be the most cost effective | This option implies TPV still needs to manage applications which will still imply IT skills and cost | A near shore managed service could be possible but consideration must be made WRT data ownership | Considering the level of personal data cloud sourcing not an obvious choice |
| | | **Call centre** | | | Although more attractive than a full offshore capability as calls must be transferred into and out of TPV native english speaking is preferred | |
| | | **TPV** | Given the level of interaction with OFCOM and UK CSPs it is expected that TPV will be onshore | | | |
| | **Offshore** – TPV runs from a very low cost location | **Hub** | TPV maintaining hardware and applications itself will be the most cost effective | This option implies TPV still needs to manage applications which will still imply IT skills and cost | An offshore managed service could be possible but consideration must be made WRT data ownership | Considering the level of personal data cloud sourcing not an obvious choice |
| | | **Call centre** | | | As calls must be transferred into and out of TPV from a variety of CSPs native english speaking is preferred | |
| | | **TPV** | Given the level of interaction with OFCOM and UK CSPs it is expected that TPV will be onshore | | | |

*Source: PwC*

# Appendix F. - Supporting transfer of customer to TPV

## F.1. Voice and data – High level design

This section of the document identifies important cost drivers in the required design to support the proposed industry processes.

*Figure 6-12 ServCo.'s Voice and data systems needed*
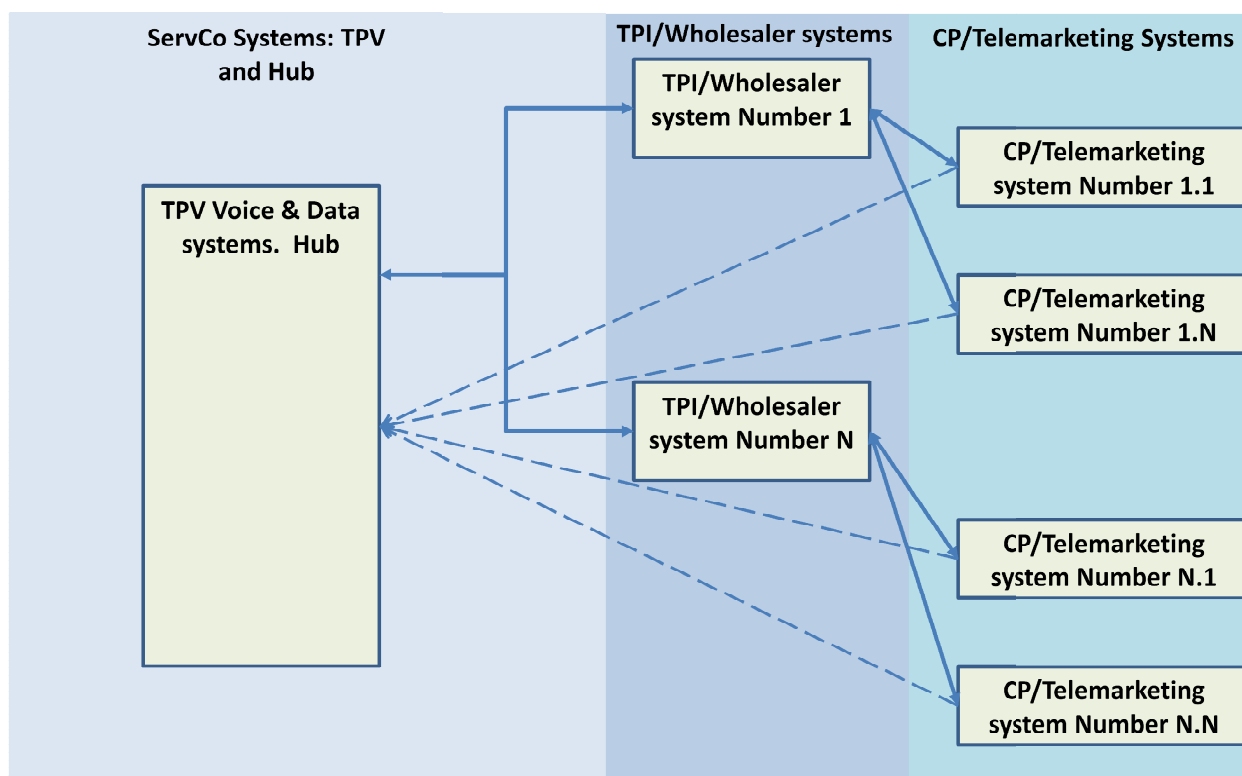


*Source: PwC*

The diagram above shows how ServCo.'s Voice and data systems need to interconnect with

- TPI/Wholesaler systems so that the Hub is updated with information on proposed switches by CP sales personnel and online sales systems. This connection also provides data on CP customer calls that are being transferred to the TPV to be validated. The data on customers calls is to ensure that the TPV agent is primed with data that enables them to process the call efficiently and with an acceptable customer experience, for example avoiding time consuming searches or customer "identification and verification" procedures";
- CP/Telemarketing systems, so that the transfer of a calls from a CP or its telemarketing partners voice systems can be achieved.
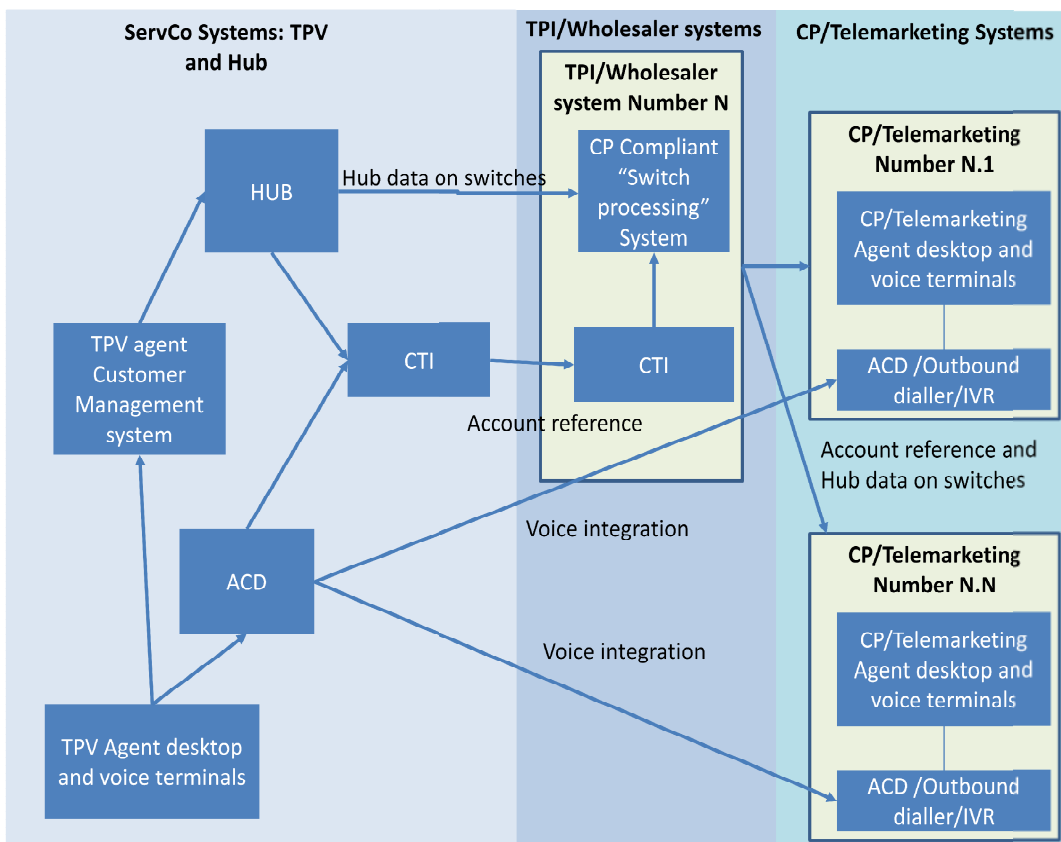
For simplicity only two of the possible TPI/Wholesaler entity options are shown (TPI/Wholesaler system Numbers 1 and "N"), and four CP/Telemarketing systems options (1.1, 1.N., 1. and N.N) for conformant processing solutions.

Note that the expected use of TPI or wholesaler systems by smaller CPs and their telemarketing partners reduces the expected number of system entities that need to be integrated to the hub significantly. This reduces complexity and cost. However, there is still a requirement to support voice interconnection to deliver the transfer of calls from a CP (or their outsourced telemarketing partner) in an efficient, customer orientated way, commensurate with the commercial value of the call – that is a converted sale of a telecoms service.

# F.2. Voice and data – Entity level summary design

The diagram below summarizes some of the key systems components that need to be integrated. In our design we estimate that there more than c. 28 TPI/Wholesaler and CP systems will be integrated into the Hub, with TPI and wholesaler systems meeting the data processing needs of smaller CPs. The diagram indicates the need, to achieve some sort of integration with the voice and data systems of CP's sales operations – c 300 entities.

*Figure 6-13 Key systems components needed*



*Source: PwC*

*Table 57 Explanation of figure7.3*

| Acronym | Purpose |
| --- | --- |
| CTI | Computer Telephony Integration Server (CTI) is software and physical infrastructure that is used to connect to and coordinate both voice processing systems and applications such as CRM or order processing systems. It synchronizes the delivery of telephone calls and useful data to human CSRs and IVRs, for the purposes of reducing cost, improving process effectiveness and automating steps that otherwise require human processing |
| Agent Desktop terminal | This is a computer, coupled with any client applications, that an agent will use to process calls received or, in the case of outbound telemarketing, presented to the agent for processing |
| ACD | Automatic Call Distribution systems (ACDs) are the heart of contact centres, processing calls and communicating with systems such as Interactive Voice Response systems (IVR) and CTI. |
| Outbound dialler | Outbound diallers, using a list of customers, make calls automatically to them without CSR intervention. They pass answered calls to CSRs for the purposes of running sales or other processes. Typically they interconnect with CTI systems so that when a call is presented to an agent, the agent's Desktop terminal is primed with customer details |
| IVR | Interactive Voice Response systems (IVR) simulate an interaction with a human for the purposes of soliciting or impairing information. Through the use of speech or touchtone recognition, humans can "interact" with a script and navigate to useful service options, or provide data to identify and verify identities |
| Agent Voice Terminal | This is a device which enable a CSR (that is agent) to communicate to a customer or IVR via the ACD or Outbound dialler |

# F.3. Voice and data – design for a single CP/Telemarketing system using CTI Transfer

The diagram and table below shows the system components and an illustrative flow of steps for a single CP, using a compliant CP "Switch processing" system sourced from a TPI, and CTI capabilities.

*Table 58 Single CP switch process*
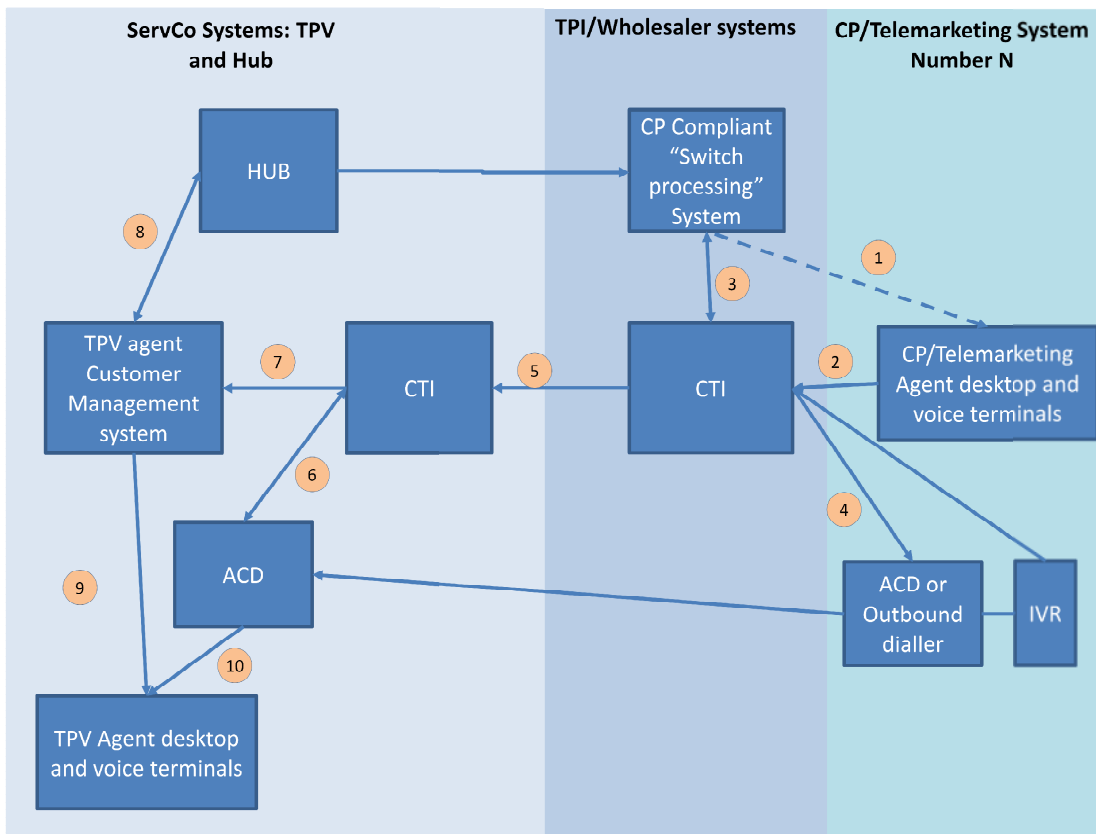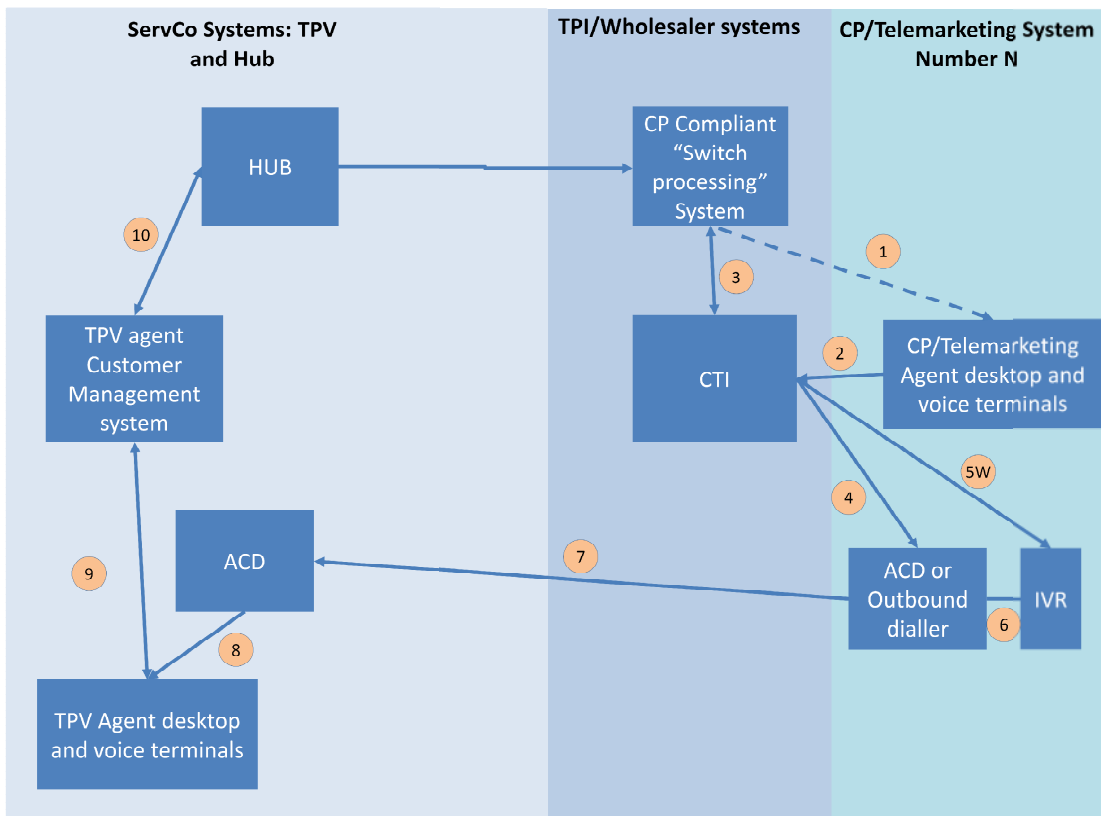


*Source: PwC*

*Table 59 Steps description*

| Step | Overview |
| --- | --- |
| 1 | The CSR completes the sales call, updates the CP Compliant "Switch processing" System with relevant data which, in turn, updates the Hub with relevant data on the transaction |
| 2 | The CSR requests via CP/Telemarketing Agent desktop or voice terminal that the customer be transferred to TPV |
| 3 | The CTI server requests then receives reference data which the TPV can used (downstream) in identifying the customer and locating records in the Hub when the customer is transferred |
| 4 | The CTI server requests CP's voice system (ACD or Outbound dialler) to make a call to the TPV, put the customer on "hold" |
| 5 | The wholesaler's systems communicate with the TPV to transfer reference data which the TPV can use to identify the customer and locate records in the Hub |
| 6 | CTI provides reference data to the TPV ACD, and requests that the ACD informs it when it is ready to transfer a call to a CSR and to provide data to help other systems locate that CSR (that is provide data to enable "screen popping") |
| 7 | CTI provides reference data to the TPV Customer Management system to enable it to prepare for screen popping customer details to a TPV agent when a call is put through |
| 8 | The TPV Customer Management system uses reference data to pull relevant records from the Hub for presentation to a CSR as part of a "screen pop" |
| 9 & 10 | When the ACD determines a specific agent is free, it informs CTI server (via route 6) that transfer is taking place. The CTI server co-ordinates a screen pop, and presents relevant records to the TPV agent via its Agent desktop, together with a customer call |

# F.4. Voice and data – design for a single CP/Telemarketing system using Whisper Transfer

The diagram below shows what the solution for a smaller CP looks like where whisper transfer is used. Note

- A high volume of CTI integrations – c. 300 - are required;
- There is no need for third party systems to integrate to TPV voice systems to deliver this solution;
- ServCo. TPV CTI capability will be needed for larger CPs, TPIs and Wholesalers.

*Table 60 Whisper transfer solution for a smaller CPs*



*Source: PwC*

*Table 61 Process steps*

| Step | Overview |
|------|----------|
| 1 | The CSR completes the sales call, updates the CP Compliant "Switch processing" System with relevant data which, in turn, updates the Hub with relevant data on the transaction |
| 2 | The CSR requests via CP/Telemarketing Agent desktop or voice terminal that the customer be transferred to TPV |
| 3 | The CTI server requests then receives reference data which the TPV can used (downstream) in identifying the customer and locating records in the Hub when the customer is transferred |
| 4 | The CTI server requests that the CP's voice system (ACD or Outbound dialler) makes a telephone call to the TPV, and puts the customer on "hold" listening to either silence, ring tones or music |
| 5W | The CTI server provides reference data to the CP's IVR for use in the Whisper transfer |
| 6 | The IVR holds two telephone calls open: (1) on one call, it plays music or ringtone to the customer, while (2) on the other call , the IVR "speaks" repeatedly the reference data provided to an open voice channel ACD |
| 7 | The CP ACD/Outbound dialler, across an appropriate network, makes an outgoing call to the ServCo TPV's ACD system. The ServCo TPV system answers the call providing an end-to-end voice path between the two systems |
| 8 | When a CSR (agent) becomes available, the ACD buts the call through to the agent's voice terminal, who will then here the remote IVR "speak" the reference data. The CSR will note the number, enter it into the Agent desk top terminal (that is desktop computer with TPV agent management Customer Management system) and pull up the relevant data from the Hub |
| 9 & 10 | The CSR will enter the reference data into the Agent desk top terminal (that is desktop computer with TPV agent management Customer Management system) and pull up the relevant data from the Hub |

# *Appendix G. - Sense Check on numbers*

Following completion of our cost assessment we performed a quick piece of analysis to support our findings and provide a 'sense check' that our figures are reasonable. Automation is expensive and technically complex and this piece of analysis seeks to confirm that our specifications are reasonable.

This involved identifying a low tech solutions for simulating TPV without a Hub. In forming these solutions we ignored customer experience and operational complexity and replaced automated Hub services with human clerical work, accepting the associated negative implications, such as an increase in error rates.

The cost estimate for this solution came in higher than our estimate for the GPL TPV model defined in this document, reinforcing our model as a cost effective and efficient solution.

## *G.1.1. Low tech TPV solution*

*10 year cost for low tech TPV solution 1 is circa £170m which delivers TPV at a lower level of customer service and with increased*

Under this low tech solution the GP carries out a simple workflow of a validation request to TPV services without a Hub. Instead of using an automated Hub, the TPV service provider contacts a customer post sale to validate consent then manually accesses CP systems to obtain a transfer code and set cessation dates.

*Table 62 Low tech TPV solution -TPV service opex*

| Cost elements | Comment | Annual | Five years | 10 years |
|---|---|---|---|---|
| Cost per validation | Same as automated case | £ 2.00 | | |
| Cost of after call work - Contact and use losing provider systems | Assume 5 minutes at 60 pence per minute. (Process is complex and will need higher skill levels).Use native access to LP's systems | £ 3.00 | | |
| Cost of after call work - Gaining provider | Assume 2 minutes at 60 pence per minute. (Process is complex and will need higher skill levels).Use native access to GP's systems | £ 1.20 | | |
| Volume of calls | Higher due to failure to contract decision makers on first call | 2,375,162 | | |
| TPV service opex | | 13,640,000 | 68,200,000 | 136,400,000 |
| Other opex | | 2,000,000 | 10,000,000 | 20,000,000 |
| Total opex | | 15,640,000 | 78,200,000 | 156,400,000 |

*Table 63 Low tech TPV solution - Set up costs*

| Cost elements | Comment | Annual |
|---|---|---|
| IT Costs per connection to CP | Assume TPV has native access via Web or Citrix to CP systems | £40,000 |
| Number of CPs | | 300 |
| Total IT set up costs | | 12,000,000 |
| Other set up costs | | 2,000,000 |
| Set up costs | | 14,000,000 |

*Table 64 Low tech TPV solution 1 - Total costs*

| | Annual | Five years | 10 years |
|---|---|---|---|
| Total opex | 15,640,000 | 78,200,000 | 156,400,000 |
| Set up costs | 14,000,000 | 14,000,000 | 14,000,000 |
| Set up costs | 29,640,000 | 92,200,000 | 170,400,000 |

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