Cross-Platform Consumer Switching

Cost Assessment

VERSION 1.0
NON-CONFIDENTIAL

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1. Introduction

1.1. Context

Consumer switching processes in the UK communications sector have evolved over time, with several processes emerging for different services (fixed voice, broadband and pay TV).

In 2010, Ofcom launched a strategic review of consumer switching processes which resulted in changes to the processes used to switch fixed voice and broadband services on the KCOM and Openreach networks.[1] Ofcom decided that all switches for fixed voice and/or broadband services within the KCOM and Openreach networks would be harmonised to a Gaining Provider Led (GPL) approach with enhancements to the Notification of Transfer (NoT) process. The new "GPL NOT+" was adopted by the industry in June 2015.

Switching fixed voice, broadband or pay TV services between the Openreach and Virgin cable networks still follow a Cease & Re-provide (C&R) arrangement. Switching pay TV services to or from the Sky satellite network also follow C&R.

In July 2014, Ofcom published a Call for Inputs (CFI) that sought industry views on the process of consumer switching between providers of "bundled voice, broadband and subscription Pay TV services, and mobile voice and data services". With this document, Ofcom sought to improve its understanding of current switching processes. Specifically, the regulator expressed an interest in consumer experiences of these switching processes, and whether any alternative switching processes are available for consideration.

Within Ofcom's programme of work on consumer switching, Ofcom engaged Cartesian to conduct a feasibility study of options to reform the existing processes for switching fixed voice, broadband and pay TV services between providers using the Openreach, Virgin cable and/or Sky satellite networks.

1.2. Scope

In late 2015 Ofcom carried out quantitative and qualitative research across a full range of switching scenarios of triple play switching to better understand consumers' experiences including the nature and scale of any harms. Ofcom shared with Cartesian the findings and Cartesian was then asked to develop potential alternatives to the current switching processes that would help to address the issues identified. In particular, measures that could help to address loss of service; double paying; difficulties contacting the losing provider (LP)/cancelling existing services and lack of awareness of implications of switching (IS). Cartesian also considered how to mitigate potential unintended consequences of the measures and assessed the impact to industry should these be adopted.

The focus of the project was on the technical and operational aspects of consumer switching of communications services between communication providers (CPs) that use different delivery platforms, i.e. cross-platform switches. This included a consideration of both the processes (operational activities) that the CPs undertake and the systems (software applications) that support the CPs' business operations.

[1] Openreach copper network including fibre to the cabinet but excluding fibre to the premises.

The following switching cases were within the scope of the project:[2]

- Switching of fixed voice, broadband and/or pay TV services between Virgin Media and another CP
- Switching of satellite pay TV from Sky to another CP (switched either by itself or alongside voice and/or broadband).

The following items were outside the scope of the project:

- Switches that only involve services delivered on the Openreach network, i.e. where there is no cross-platform switch occurring
- Over-the-top TV services, e.g. NOW TV, Netflix (services offered over broadband that are agnostic to which CP is supplying the broadband connection)
- Mobile voice and broadband services
- Switching during a home move
- The commercial and legal implications of the potential alternative options and any costs associated with these implications
- Consumer benefits and costs, i.e. the assessment only takes into account costs borne by CPs

1.3. Approach

Cartesian worked with Ofcom to identify and characterise alternative switching options for cross-platform switching to help remove or mitigate the harms experienced by consumers when switching. Cartesian first considered potential changes to CP front-end activities that would address the harms, i.e. changes to the interaction between the consumer and CP(s) to order and orchestrate the switch of service.

Cartesian then considered potential changes to the CP back-end activities which would be required to support the front-end changes. The back-end encompasses activities that are internal to a CP and also coordinating activities which occur between CPs.

Two front-end and two back-end options were selected for assessment. When combined, the front-end and back-end options result in four potential end-to-end switching scenarios:

1. Enhanced Cease & Re-Provide (EC&R) Cross-Platform switching using Openreach EMP System Extension back-end solution
2. Enhanced Cease & Re-Provide (EC&R) Cross-Platform switching using New Direct Inter-CP Communication Channel back-end solution
3. Gaining Provider led (GPL) Cross-Platform switching using Openreach EMP System Extension back-end solution
4. Gaining Provider led (GPL) Cross-Platform switching using New Direct Inter-CP Communication Channel back-end solution

[2] The original scope of the project was broadened to include the switching of standalone pay TV services.

Specifications were developed for the front end and automated back end options. These documents describe the processes, and assess the application impacts and interfaces of each switching option.[3]

Cartesian then developed a cost model to assess the cost to industry of adopting the potential changes. We used the model to analyse the relative costs of the potential alternatives and the sensitivity of those costs to key input assumptions.

Cartesian also considered at a high level a potential manual back-end process for low cross platform switching volumes. This is discussed further in section 5.

1.4. Report Structure

This remainder of this document is structured as follows:

Section 2 provides a summary of the process specification documentation prepared for each of the alternative switching front-end and automated back-end options. This documentation includes detailed process designs and the impact assessment of the required changes.

Section 3 describes the methodology for the cost assessment. It provides an overview of the model, its structure and the approach, and the assumptions used.

Section 4 presents the results of the cost assessment. For each alternative option, the implementation cost (capex) and change to ongoing cost (opex) is presented in addition to the 10-year net present cost (NPC). The model outputs under sensitivity-adjusted input assumptions are compared against base case conditions. An analysis of the results and key take away are discussed at the end of the section.

Section 5 describes how a manual back end option might work and potential cost savings from not having an automated option for low switching volumes, along with the limitations of a manual back-end process.

Appendix A summarises which processes and systems are impacted by each of the potential changes in a high-level matrix.

Appendix B sets out the estimates of the process and system development effort to implement the changes.

This version is non-confidential. *Redactions* are indicated by [✂].

[3] Enhanced cease and re-provide front-end process use caseshttp://stakeholders.ofcom.org.uk/binaries/consultations/making-switching-easier/cartesian/cart1.pdf
Gaining provider led front-end Process use cases
http://stakeholders.ofcom.org.uk/binaries/consultations/making-switching-easier/cartesian/cart2.pdf
Direct inter-CP communications back-end process use cases
http://stakeholders.ofcom.org.uk/binaries/consultations/making-switching-easier/cartesian/cart-back1.pdf
Openreach EMP back-end process use cases
http://stakeholders.ofcom.org.uk/binaries/consultations/making-switching-easier/cartesian/cart-back2.pdf

2. Overview of the Process Specifications

2.1. Process Specifications

In this section, we provide a summary of each of the options for cross-platform switching. Full details of the options can be found in the specification documents.

As described above, a distinction is made between '*front-end*' and '*back-end*' activities. The '*front-end*' is the initial interaction between the consumer and CP(s) to validate the switching request and obtain the consumer consent. The '*back-end*' covers both the internal CP and CP-to-CP technical activities.

There are four process specification documents: two describing the front-end options – EC&R and GPL – and two describing the automated back-end options – Openreach EMP Extension and the New Direct CP Channel. Note that the front-end documentation should be read in combination with the documentation addressing alternative back-end implementations.

The specifications take the form of Use Case documents.[4] These describe the process steps, application impacts and interfaces requirements of the each of the alternative options.

The purpose of the specifications is to provide stakeholders with sufficient information in order for them to understand what the process options would involve so that they can consider what impact this would have on their business and the costs of implementation. We use TM Forum frameworks for business processes (eTOM) and applications (TAM) for mapping out the impacts, which enables an industry-standard and CP-agnostic approach.[5]

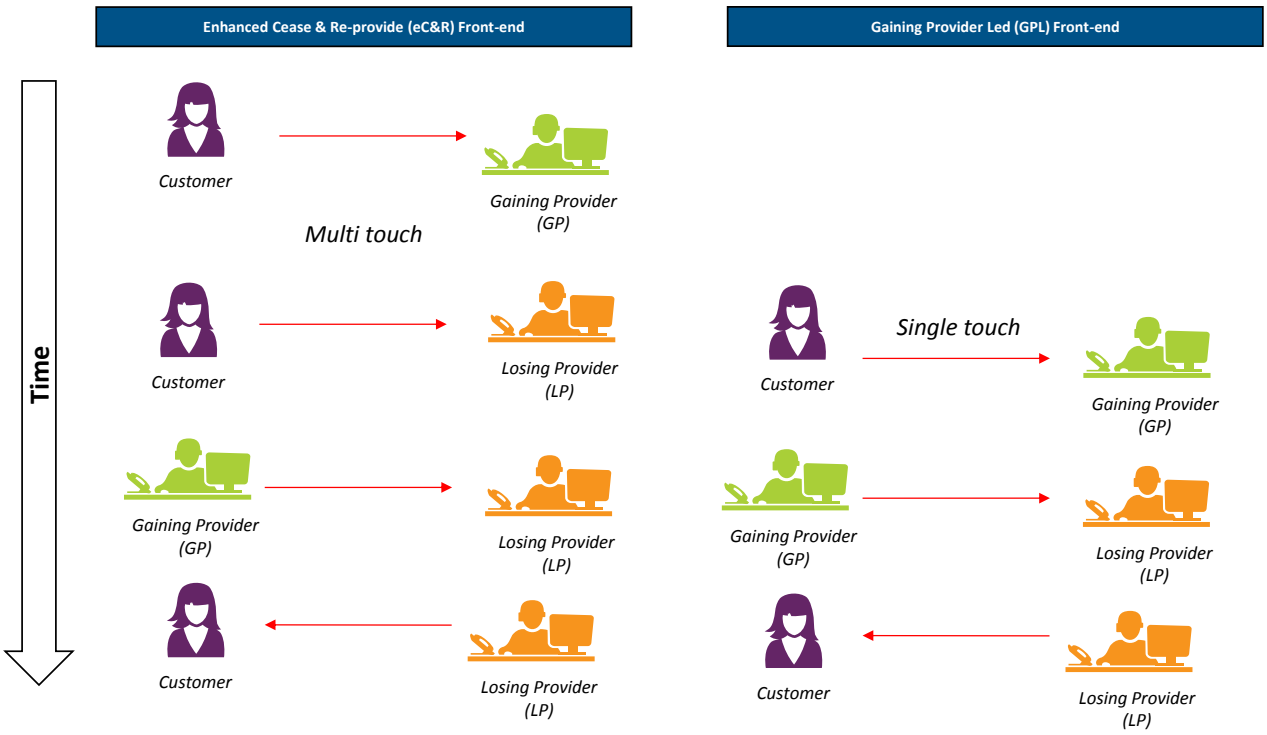
2.2. Front-End Process Options

Two front-end process options were considered. The front-end process largely defines the consumer experience and hence these front-end process options provide two alternative switching scenarios from a consumer perspective.

[4] The specification document format is similar to those created for the Switching Working Group in support of Ofcom's earlier project on fixed voice and broadband switching, e.g. within the Openreach network.
http://stakeholders.ofcom.org.uk/binaries/telecoms/groups/swg/processed/SWG_Switching_Process_Use1.pdf

[5] eTOM (Enhanced Telecom Operations Map) and TAM (Telecom Applications Map) are industry-standard frameworks developed by the TM Forum

Figure 1. ***Alternative options considered for the front-end process***



2.2.1. Enhanced C&R Front-End

In the EC&R Front-End the consumer must contact the LP to cease their current services and contact the GP to order the new services. This option provides the customer with additional channels to cease their services with the current provider.

Having placed these orders, the consumer may elect to have the GP to directly coordinate switching activities with the LP to reduce loss of service and double payment. This avoids the consumer having to manually orchestrate the activities of the two CPs.

The cease and activation journeys remain largely independent, however back-end coordination is introduced to align the cease and activation dates. In this option, the consumer still needs to place the cease and activation orders with the GP and LP respectively; the GP is not empowered to trigger the cease of LP services on the consumer's behalf.

2.2.2. GPL Front-End

The GPL Front-End enables consumer cross-platform switching with a single touch point.

The GP coordinates the entire process on behalf of the consumer after a switch order is placed. The GP is responsible for receiving the switching request from the consumer, orchestrating the activation of the services and coordinating the cease of services with the LP.

The process aligns with the GPL NoT+ process that is used for switching services within the Openreach platform.

2.3. Back-End Process Options

Back-end solutions already exist to support fixed voice and broadband switching within the KCOM and Openreach platforms. Industry has developed systems and processes to coordinate those switching activities.

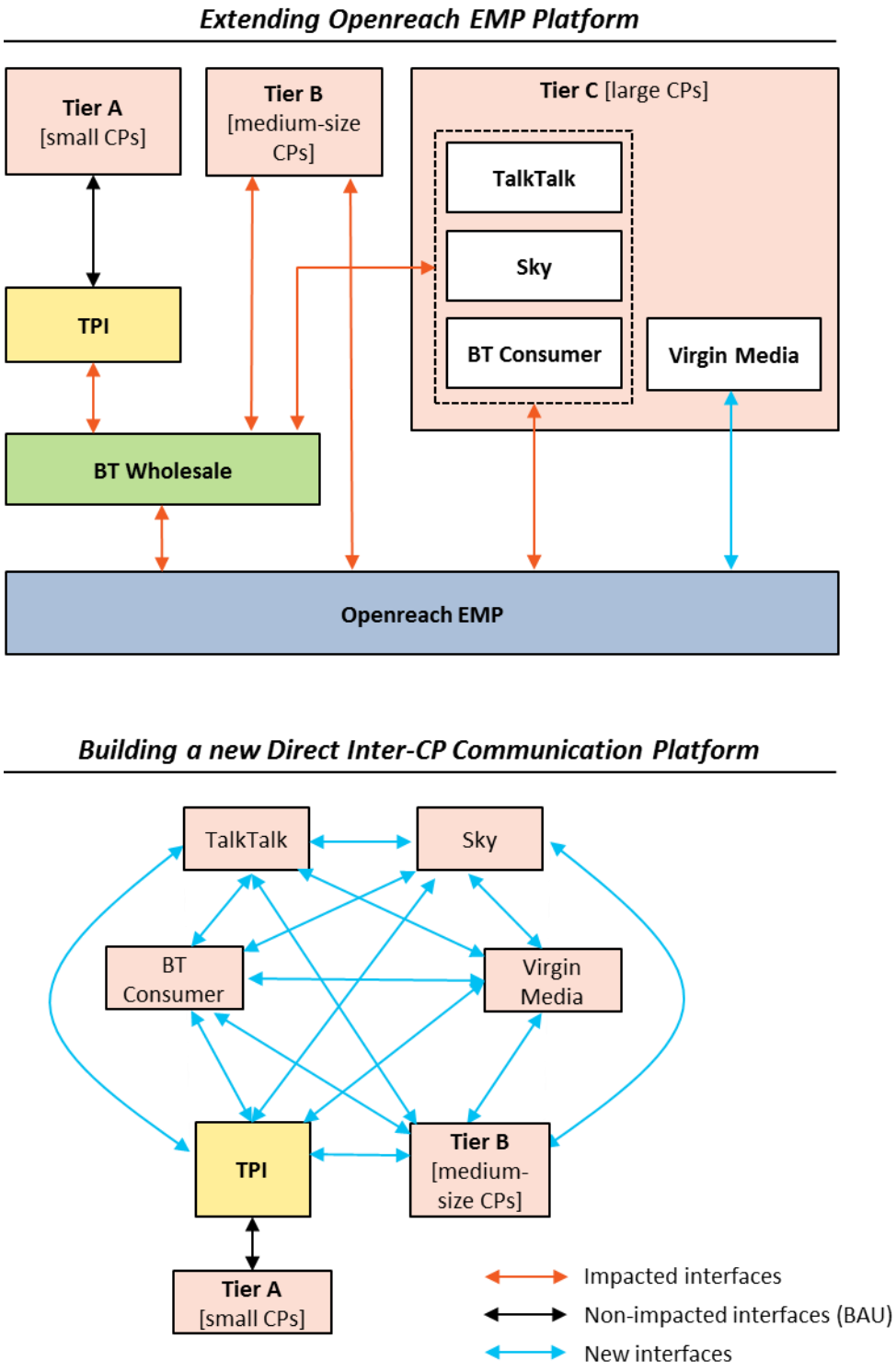
However, for the cross-platform switching cases within the scope of this study, no such channels/processes exist.

The alternative front-end options considered for cross-platform switching introduce a degree of coordination between CPs, e.g. to align start and stop dates. To facilitate this, an inter-CP communication channel and processes would be required. This would allow CPs to communicate the switch date and any subsequent changes regardless of the delivery platform.

We considered two high level options for the back-end as illustrated in the figure below. The first is to use the existing Openreach EMP platform to support the additional switching cases and the second is to set up a new communications channel between CPs.

The figure below shows the communication interfaces required between the various actors in the broadband supply chain. These include retail CPs (which are segmented by size, from A (smallest) to C (largest)), Openreach and BT Wholesale. Also shown are third party integrators (TPIs) which develop and operate support systems for tier A CPs (on a managed service basis). Section 3.3.1 provides further details of the CP segmentation.

Figure 2. ***Alternative options for the new Inter-CP Communications Channel***



2.3.1. Openreach EMP Extension Back-End

The Openreach EMP Extension back-end uses the existing Openreach EMP system as a foundation for an inter-CP communications hub.

Openreach EMP is already used in the GPL NoT+ process for fixed voice and broadband switching on the Openreach access network. Extending EMP to cover the additional scope requires system development across industry.

Extensions to EMP would be required to support the forwarding of messages between CPs for cross-platform switching. EMP would not be required to interpret these messages, it would simply provide a message routing and delivery function.

The EMP back-end could be used with either the EC&R or the GPL front-end.

2.3.2. Direct CP Channel Back-End

The Direct CP Channel (DCC) back-end supports direct communications between CPs to coordinate switching activities without a central hub. This option uses a mesh architecture rather than the hub-and-spoke of the EMP back-end.

The DCC back-end can be used with either the EC&R or the GPL front-end.

3. Cost Assessment Methodology

3.1. Overview

In this section, we set out our methodology for assessing the potential costs to industry that would arise from adopting the alternative switching scenarios described in Section 2. This section includes a description of the cost model and the key input assumptions.

The model estimates the incremental costs of the alternative switching scenarios considered relative to the status quo, and thus shows the net impact of change to the industry. It covers both one-off capex and ongoing opex. The opex includes both fixed costs (for platform support) and variable operating costs driven by the volume of switches.

The model was designed with the following principles in mind:

- to have sufficient granularity of costs to allow input assumptions to be validated;
- to allow for variation in the level of cost impact between different types of CP;
- to allow sensitivity analysis, for example testing upper and lower estimates of costs, or changes in the volume of consumers switching.

Ofcom and Cartesian sought input from the four largest providers in the industry – BT Consumer, Sky, Virgin Media, TalkTalk – as well as Openreach, to validate the working assumptions for the identified options. The CPs were asked to provide their own cost estimates using the process specification documentation. At the time of writing, no cost inputs were submitted by CPs. The implementation costs in the model are therefore largely based on Cartesian's own estimates. These are informed by our experience in supporting companies implement change to their business operations and our analysis in support of Ofcom's strategic review of consumer switching processes (2010).

3.2. Model Structure

From a high-level perspective the model is divided into three main sections:

An **input section** containing the assumptions used to drive the model. It includes:

- General assumptions like the number of CPs, agent handling time, and salary costs for agents and other full-time employees (FTEs).
- Assumptions relating to the switching options where we calculate the total cost per switch derived from option-dependent assumptions like the percentage of consumers following the GPL process, or the additional time to complete a switch.
- CP related assumptions, where we define the number of agents and other full-time employees to be trained and the related training costs.
- the estimates for the delivery effort required to implement the process and system changes, according to their complexity and the different factors to capture for delivery synergies.
- the total delivery effort for each one of the major changes to be applied under each switching option.
- estimates of switching volumes per CP.

A **calculation section** that determines the opex and capex costs for delivering each alternative option:

- It comprises several worksheets that calculate the opex and capex costs of each option at a process and system level as per the TAM and eTOM frameworks.

An **output section** consisting of a comparative view of the switching scenarios costs over a 10-year period:

- The output section combines the process and system costs of each option.
- Net present costs (NPC) are calculated over a 10-year period, for individual CPs and industry as a whole.

The cost model considers the costs to CPs in each of the scenarios and sums these to determine the overall cost to industry:

- The costs for each of the four largest providers are considered individually, as these CPs account for the majority of switching activity and this set includes the two CPs (Sky and VM) which deliver services on non-Openreach platforms.
- For BT, the cost impacts to BT Consumer, BT Wholesale (BTW), and Openreach (OR) are considered separately.
- Other CPs are segmented into two tiers[6]:
  - Tier A CPs are those which use the billing and operational support systems of a third party integrator (TPI).
  - Tier B CPs develop and support their own systems.
- The impact to TPIs (in terms of systems development costs) are also modelled and are included in the overall costs to industry.

3.3. Input Assumptions

The input assumptions used in the cost model include information gathered by Ofcom from a formal information request to the four largest providers (BT, Sky, TalkTalk and Virgin), recent consumer research[7], and estimates where required. Below, we list the assumptions used in the model and their respective sources.

A number of simplifying assumptions were made in the cost modelling:

- Costs are based on a static view of the industry. We have not taken into account any changes in the market with regards to switching rates, mix of channels to market, number of providers, or other industry trends;

[6] The same segmentation approach was adopted in the impact assessment for Ofcom's strategic review of consumer switching processes (2010).
[7] http://stakeholders.ofcom.org.uk/binaries/consultations/making-switching-easier/research/bdrc-slidepack.pdf

- The model uses real costs rather than nominal values; unit costs are held constant over the period of analysis;
- The back-end Operation and Business Support Systems (OSS/BSS) of the four largest providers are similar in terms of size and complexity (and hence development effort);
- The model assumes that customer support agent costs are fully variable – specifically, the model assumes customer support costs can be flexed down in response to lower demand;
- We have not considered the cost of implementing new customer communication channels (e.g. online account, IVR and webchat) for CPs that do not currently have that functionality. This is most likely to apply to some Tier A CPs.
- We assume that field activities are not impacted, i.e. field technicians follow their existing procedures and that this already includes confirming to their job controller once an installation is complete.
- We have not quantified the effects on costs as a result of changes to call volumes that result from the following but think it likely that the net effect will be to reduce calls and therefore achieve greater cost savings than estimated:
  - calls to resolve queries that could occur during the asset validation stage of the process if this cannot be completed during joining, e.g. due to difficulties identifying the correct assets. This may lead to a small increase in call volumes;
  - the inclusion of implications of switching information on bills, better information about the switching process and reduction in calls to the LP when there are changes to the service provisioning date as these can be handled by the CPs on behalf of the customer. This may lead to a decrease in call volumes.

3.3.1. General Assumptions

General assumptions include agent and other employee wages, the average times for the consumer-CP interactions during the user journey, and the discount rate for the NPC calculation. The table below lists the key assumptions and their sources.

Figure 3. ***General Input Assumptions***

Input	Value	Source
Number of large CPs	4	The number of the four largest triple-play providers in the market today
Number of other CPs	50 (Tier A) 11 (Tier B)	Cartesian estimate based on Ofcom data for Tier A Ofcom estimate based on Openreach and Simplifydigital data for Tier B
Number of TPIs	5	Cartesian estimate based on Openreach data
Customer Support Agent (CSA) costs (fully loaded)	£0.24/min	Based on formal information request by Ofcom from 4 largest CPs

Technical staff costs (fully loaded)	£0.69/min	Based on market rates published in a major UK job site with an estimated 60% employer overhead and an assumed 240 x 8 hr days/year
Technical trainer costs (fully loaded)	£0.69/min	Assumed to be similar to technical staff costs
Number of staff per training session	12	Cartesian assumption
IT Consultant Daily Rate	£500	Based on market rates
Discount Rate	3.5%	Social Time Preference Rate (STPR) as recommended by the HM Treasury Green Book, 2016.
WACC	7.84%	Real WACC based on 10% pre-tax nominal WACC Provided by Ofcom informed by WACCs previously applied by Ofcom to telecoms operators, including most recently a pre-tax nominal WACC of 9.9% for BT Group in the 2016 LLCC Statement [8]

3.3.2. Input Assumptions Dependent on CP and Switching Option

Certain assumptions vary according to the CP and switching option being simulated. The option-dependent assumptions have a direct impact on the calculations of the total cost-per-switch.

Figure 4. ***CP and Option Dependent Input Assumptions***

Input		Value	Source
CP dependent	Number of CSAs to be trained in BT	[✂]	Based on formal information request by Ofcom from 4 largest CPs
	Number of CSAs to be trained in Virgin Media	[✂]	Based on formal information request by Ofcom from 4 largest CPs
	Number of CSAs to be trained in Sky	[✂]	Based on formal information request by Ofcom from 4

[8] http://stakeholders.ofcom.org.uk/binaries/consultations/bcmr-2015/statement/final-annexes-29-30.pdf

			largest CPs
	Number of CSAs to be trained in TalkTalk	[✂]	Based on formal information request by Ofcom from 4 largest CPs[9]
	Number of CSAs to be trained in Tier B CPs	100	Cartesian assumption
	Number of CSAs to be trained in Tier A CPs	5	Cartesian assumption
	Ongoing support costs %	20%	Cartesian estimate
Option Dependent	% of switchers accepting GP coordination (under EC&R)	55%	Data provided by Ofcom. Set out in Ofcom annex 8[10]
	% of switchers using GPL process (under GPL)	70%	Data provided by Ofcom. Set out in Ofcom annex 8
	% of switchers that do not contact the LP (under GPL)	40%	Data provided by Ofcom. Set out in Ofcom annex 8
	% who cancel by phone and direct debit	95%	Data provided by Ofcom. Set out in Ofcom annex 8
	% who cancel by webchat	5%	Data provided by Ofcom. Set out in Ofcom annex 8
	# of webchats active simultaneously per agent	3	Cartesian assumption
	Average agent time taken during termination by phone and direct debit	12.2 mins	Input data provided by Ofcom based on a formal information request from providers. Set out in Ofcom annex 8
	Average agent time taken during termination by webchat	26.7 mins	Input data provided by Ofcom based on a formal information request from providers. Set out in Ofcom annex 8
	Average agent time post	1 min	Data provided by Ofcom. Set

[9] [✂]
[10] http://stakeholders.ofcom.org.uk/binaries/consultations/making-switching-easier/annexes/annex.pdf

	contact for making notes		out in Ofcom annex 8
	Reduction in % switchers using phone for cancelling (under EC&R)	30%	Data provided by Ofcom. Set out in Ofcom annex 8
	Increase in % switchers using webchat for cancelling (under EC&R)	5%	Data provided by Ofcom. Set out in Ofcom annex 8
	% of switchers cancelling via online portal or IVR (under EC&R)	25%	Data provided by Ofcom. Set out in Ofcom annex 8
	Additional time to complete switch	1 min	Data provided by Ofcom. Set out in Ofcom annex 8
	Additional time to complete asset validation	1 min	Data provided by Ofcom. Set out in Ofcom annex 8

3.3.3. Switching Volumes

These assumptions include the annual number of cross-platform switches per CP. The volumes were calculated by Ofcom using underlying data gathered under a formal information request from CPs. The volumes exclude home movers. Ofcom set out how these numbers are derived in annex 6.[11]

The number of switches per annum is held constant over the period of analysis.

3.3.4. Delivery Effort Estimates for System and Process Changes

Together, the alternative switching options comprise eight major changes. These all apply to both the EC&R and GPL options with the exception of the new termination channels which only applies to EC&R:

1. Addition of IS/ Early Termination Charges (ETC) information to the customer monthly bill ('IS/ETC added to monthly bill')
2. Provision of new channels for consumers to request contract termination ('Termination Channels')
3. Requirement for CPs to capture a record of consent for all CPs and services within the scope of this study (Record of Consent (Phone & Web))
4. Requirement for new order requests for the switch, activation, cease, cancel and update front-end use cases ('Front-End (FE) Order Requests')
5. Requirements for CPs to send communication letters with IS/ETC ('CPs communication letters with IS/ETC')
6. Validation of customer account and asset with LP ('Asset Validation')

[11] http://stakeholders.ofcom.org.uk/binaries/consultations/making-switching-easier/annexes/annex.pdf

7. Requirement for new order requests for the switch, activation, cease, cancel and update back-end use cases ('Back-End (BE) Order Requests')
8. Requirement for GPs to send confirmation of completed switch to LP ('Switch Completion Confirmation message')

Each of these changes has an impact on CP processes and systems, as described in the process specifications. A high-level summary matrix with the process and systems impacted by each major change is also presented in Appendix A.

The potential costs of changes to CP systems (software applications) and processes (operational activities) are analysed on a bottom-up basis using estimates of the required effort in systems development, process modification and staff training. These estimates are set out using the same TM Forum frameworks for business processes (eTOM) and applications (TAM) that are used in the impact assessments, and can thus be cross-referenced to the process specifications.

The effort estimates for the Tier C (large) CPs for each of the major cost categories are shown in the table below. These estimates consider the time required for an end-to-end IT delivery project, including requirement gathering, solution design, documentation, software development, implementation and testing. They are based on Cartesian's industry experience of the necessary steps and the ways CPs are likely efficiently to take them.

A more detailed break-down of the effort estimates is provided in Appendix B.

Figure 5. ***Total Delivery Effort Estimates (Tier C CP)***

Major Change	Effort (Days)		Development Activities
	Process	System	
Front-End Changes			
IS/ETC added the monthly bill	30	120	Systems development required to make changes to the bill template and implement an automated calculation of the ETC and IS in every monthly billing cycle. The systems development estimate reflects the complexity of billing systems in general. New processes defining the provisioning of the new functionalities and the related data is required. Process development is relatively simple as no CSA intervention is required.
Termination Channels	60	60	Implementation of the two new termination channels for the EC&R front-end scenarios: via IVR and an online portal. These new solutions require new processes, defining all the interaction and possible use cases that the customer will need. The system implementation estimates assume that Tier B and Tier C CPs already have IVR, an online portal and webchat; the estimate is therefore to adapt the existing platforms to address the contract termination use case.
Record of Consent (Phone & Web)	30	60	Systems and process development required to extend existing requirement of durable records (e.g. call

			recordings) solutions to include cross-platform switching scenarios. We assume that transaction records for online orders are already stored and captured. The system changes only apply to Virgin Media as it is not covered by the existing NoT+ process obligations.
Front-End Order Requests	60	150	Implementing this change requires the definition of new order requests, message payloads, and new CSA scripts. The systems development effort reflects the need to make changes on a number of different systems; interfaces changes required to send and interpret the new message format and content, and the subsequent triggering of new events across the OSS/BSS platform.
CPs communication letters with IS/ETC	30	60	We assume that CP communications letters will be template-based and automatically populated with customer-specific IS/ETC information. This requires the definition of new customer communication templates; and the required changes to the customer and service order management systems which are usually complex platforms.
Back-End Changes (EMP Extension)			
Asset Validation: CP development of interfaces to EMP	-	320	Systems development establish the CP's interface with EMP for cross-platform switching communications. Development of new functionality to send, receive and respond to messages regarding asset validation. Existing interfaces to EMP would need to be adapted to meet the new requirements.
Asset Validation: CP development of systems not directly related to the EMP interface	60	120	Implementation of changes to systems not directly involved in the establishment of the inter-CP communications channel (above). For example, the customer information management platform, which is involved in Asset Validation but does not directly communicate with the EMP interface. CPs will need to develop their systems to capture and process all the customer data fields required for the validation step between CPs, definition of security levels, and the processes to accommodate the deviations from happy path.
Asset Validation: Openreach development of EMP	-	440	Openreach will need to extend the EMP platform to handle the new cross-platform switching messages. This will involve modifying the EMP interface to accept new messages and implementing a routing function to forward received messages to the recipient CP. The effort is estimated to be approximately 40% more than for the Tier C CPs' development effort for interfacing to EMP. There is no process development effort included as this is an automated message routing service and there is no customer interaction.

Back-End Order Requests: CP development	30	320	Systems and process development time for defining new service configuration and activation processes. The process development work is relatively low as there is no CSA involvement: this refers to the processing of the order requests on the back-end systems.
Back-End Order Requests: Openreach development of EMP	-	440	Similar to the effort described for the Asset Validation element. The three major back-end changes share the same inter-CP channel and therefore the changes required are similar at the system level. There is no process development effort included as this is an automated message routing service and there is no customer interaction.
Switch Completion Confirmation message: CP development	30	320	Development effort required for defining new service configuration and activation processes, similar to the back-end order request changes. The process development work is relatively low as there is no CSA involvement.
Switch Completion Confirmation message: Openreach development	-	440	Similar to the effort described for Asset Validation and valid for the back-end Order Request. The three major back-end changes share the same inter-CP channel and therefore the changes required are similar at system level. There is no process development effort included as this is an automated message routing service and there is no customer interaction.
Back-End Changes (DCC)			
Asset Validation: CP development of DCC interfaces	60	385	Development of the new interface for direct CP-to-CP communications for cross-platform switching. Development of new functionality to send, receive and respond to messages regarding asset validation. An extra month is allowed to deliver the changes under DCC compared to EMP. This recognises that industry would be creating a new communications channel from scratch. New messages and interfaces need to be defined, and implemented into the different impacted system as part of the new DCC Back-End option
Asset Validation: CP development of systems not directly related to the DCC interfaces	-	120	Implementation of changes to systems not directly involved in the establishment of the inter-CP communications channel (above). For example, the customer information management platform, which is involved in Asset Validation but does not directly communicate with the EMP interface. CPs will need to develop their systems to capture and process all the customer data fields required for the validation step between CPs, definition of security levels, and the processes to accommodate the deviations from happy path.

Back-End (BE) Order Requests: CP development	30	385	Systems and process development time for defining new service configuration and activation processes. The process development work is relatively low as there is no CSA involvement: this refers to the processing of the order requests on the back-end systems. From a process perspective, the development effort is the same for EMP and DCC options; however, from a system perspective, the DCC is assumed to require more work as it is a new channel.
Switch Completion Confirmation message: CP development	30	385	Development effort required for defining new service configuration and activation processes, similar to the back-end order request changes. The process development work is relatively low as there is no CSA involvement. From a process perspective, the development effort is the same for EMP and DCC options; however, from a system perspective, the DCC is assumed to require more work as it is a new channel.

Each of the major changes in the above table affects multiple processes and/or systems. Within the model, the total delivery effort of each major change is allocated across the impacted processes and systems.[12] The model then sums the development effort required by process and system, across all of the major changes.

An additional 10% is assumed for project management (PM) time throughout the delivery of the process and system changes. Two days of training effort is allocated for each major change. The effort is then split evenly across each impacted process by the change (training requirements are not proportional to the delivery effort of the process modifications).

Training costs are calculated based on the time spent by staff in training sessions, and the cost of the trainer leading the session. We assume that CSAs and technical FTEs receive training on the following changes:

- Front-End and Back-End order requests
- Asset Validation
- Switch Completion Confirmation message
- Record of Consent – Virgin Media CSAs only, as Virgin Media is not cover by the NoT+ industry process obligations
- Termination Channels – Technical FTEs only, for the more technical processes and systems (e.g. service activation and configuration)

[12] The effort allocation is based on Cartesian's assessment of the relative complexity of making changes to the affected processes and systems based on its industry experience. We conduct this step to provide an intermediate output of per-process and per-system effort for stakeholders. The allocation does not materially impact the final cost-to-industry outputs.

Training is not provided on the following changes as these are either automated (there is no CSA involvement), or the process is already in place for some of the CPs:

- IS/ETC added the monthly bill
- CPs communication letters with IS/ETC

To account for likely synergies where there are multiple changes affecting a single system/process, a synergy factor is applied to the estimates at the aggregated level. The synergy factor represents the amount of time/cost overlapping among similar tasks in project management time, process and system development time (e.g. documentation or channel implementation respectively) and training.

Cartesian made the following assumptions regarding the level of synergy that would be achieved:

- For **Process Delivery** we assume that 20% of the development effort can be avoided where there is more than one change for a single process.
- For **Front-End System Delivery** we assume that 20% of the development effort can be avoided where there is more than one change for a single system.
- For **Back-End System Delivery** the level of synergy is assumed to be higher as the back-end changes (i.e. asset validation, back-end order handling, and switch completion confirmation messages) share the inter-CP communications channel. Due to the structure of the model, the development costs of the channel are included in full in each of these three major changes. To account for this double-counting, a synergy factor of "*1 - (1/number of changes)"* is applied. As there are three major back-end changes, this results in a synergy factor of 67%.

In addition to the above, the following assumptions were also taken into account when allocating the delivery effort estimates to each of the major changes per alternative option:

- The time estimates for Tier B CPs are 50% of those allocated for Tier C CPs on the basis that Tier B CPs have smaller and less complex OSS/BSS system platform and smaller operational structure and workforce, which makes them in principle more agile to implement changes and move quickly through the different delivery stages.
- The time estimates for TPI are equal to Tier B CPs times due to similarities of their OSS/BSS infrastructure in terms of size and complexity.
- Tier A CPs estimates cover only customer-facing process changes and subsequent training; system changes are implemented via the TPIs.
- No customer facing processes are required to be developed/modified for Openreach and BTW; note, however, that some time is allocated to BTW for non-consumer facing processes as BTW needs to accommodate order requests from the reseller CPs and in turn place such orders under the GPL EMP scenario.
- In the EMP back-end scenarios, BTW needs to implement all the back-end changes; reseller CPs interact with their wholesale provider which in turn interacts with the EMP platform (as per today); Openreach needs to implement some of the back-end changes on the EMP platform side.
- In the DCC back-end scenarios, the communication is directly between CPs, even for reseller CPs, and thus neither BTW nor Openreach are involved. The orders are sent downstream to BTW where appropriate (as per today).

- While similar changes are required at both ends, i.e., CPs and Openreach, mainly at interface level, additional work is required for Openreach to prepare the routing of the different messages. Openreach will be responsible to forward the messages from *a* to *b* but the message payload will be transparent for them. No orchestration role is required from Openreach as in the NoT+ process.

The following table summarises the estimated number of days of effort required to implement the changes to the processes and systems for each of the potential alternative switching options in each of the CP tiers. The effort estimates exclude training.

Figure 6. ***Total Delivery Effort per CP and Switching Option (man-days)***

Option	Tier A	Tier B	Tier C	TPI	BTW + OR
EC&R-EMP	13	503	1148	495	854
EC&R-DCC	13	580	1173	567	0
GPL-EMP	13	431	1042	418	854
GPL-DCC	13	500	1067	489	0

In practice the work would be undertaken by a number of people working in parallel. The elapsed time to implement these changes may therefore be less than the number of days of effort. Overall we would expect industry would take approximately 18 months to implement an alternative switching option based on the time taken to implement GPL NoT+.

4. Cost Assessment Results

4.1. Base Case Model Outputs

In this section we present the outputs of the model under base case conditions and with sensitivity-adjusted model inputs as defined in the previous section. The simulated scenario considers the cross-platform switching cases for all the service bundles, i.e., dual-play, triple-play as well as standalone Pay TV, broadband and fixed voice services.

4.1.1. Capex Costs

Capex costs are the one-off set-up costs that CPs would incur to implement the alternative switching options. These costs include system development, process development, project management and training.

Capex costs vary by type of CP, with the larger CPs (Tier C) having the greatest cost. The following table shows the estimated set-up costs for each type of CP and the extrapolated industry total. As explained in Section 3.3.4, the capex costs are estimates based largely on Cartesian's assumptions of the effort required by CPs to implement new processes and systems.

Figure 7. ***Estimated capex costs per CP tier under base case conditions (£m)***

Option	Tier A	Tier B	Tier C	TPI	BTW + OR	Industry Total
EC&R-EMP	0.5	3.4	5.8	1.2	0.4	11.4
EC&R-DCC	0.6	4.1	6.0	1.5	0.0	12.3
GPL-EMP	0.5	2.9	5.6	1.0	0.4	10.6
GPL-DCC	0.6	3.7	5.8	1.3	0.0	11.4

As shown in the table, we estimate that the total capex costs for industry would be in the range of £10.6 million to £12.3 million, depending on the option selected.

The GPL-EMP option has the lowest set-up costs. This option is circa £0.8 million less costly to develop than the GPL-DCC and EC&R-EMP options which have similar capex costs to each other. EC&R-DCC has the highest capex cost of the four options considered.

In general, it can be seen that the GPL front-end options cost circa £0.8 million less than the corresponding EC&R options. This difference is largely due to the additional termination channels – the online portal and IVR – which are deployed only under E&CR.

The EMP back-end option requires lower upfront investment compared to the DCC back-end as we assume that Openreach and the CPs are able to leverage existing EMP systems; the DCC, on the other hand, would require completely new interfaces to be developed.

The fact that most CPs already have an active interface to the Openreach EMP platform, either directly or via a wholesale provider, contributes to lower development efforts.

Implementing a new direct inter-CP communications channel – DCC – requires the higher investment**.** The new inter-CP channel requires circa £0.8 million more investment overall compared to the EMP option. However, Openreach and BTW are not involved since the retail CPs communicate directly with each other.

Across all of the options, while system and process development are a significant proportion of the overall set-up costs, we observed that training is also one of the key cost drivers.

4.1.2. Ongoing Costs

The model considers two types of ongoing, operational costs:

- Fixed opex, which covers the ongoing maintenance costs for the newly developed systems features.
- Variable opex, which is a net change arising from changes in the operational processes and primarily driven by agent handling time across the different consumer channels.

The following tables show the estimated amounts of the two types of opex for each type of CP and the extrapolated industry total.

Figure 8. ***Net change in fixed opex per CP under base case conditions (annual £m)***

Option	Tier A	Tier B	Tier C	TPI	BTW + OR	Industry Total
EC&R-EMP	0.1	0.6	1.1	0.2	0.1	2.1
EC&R-DCC	0.1	0.7	1.1	0.2	0.0	2.2
GPL-EMP	0.1	0.5	1.1	0.2	0.1	2.0
GPL-DCC	0.1	0.6	1.1	0.2	0.0	2.0

Figure 9. ***Net change in variable opex per CP under base case conditions (annual £m)***

Option	Tier A	Tier B	Tier C	TPI	BTW + OR	Industry Total
EC&R-EMP	0.0	0.0	-0.3	0.0	0.0	-0.3
EC&R-DCC	0.0	0.0	-0.3	0.0	0.0	-0.3
GPL-EMP	0.0	0.0	-0.7	0.0	0.0	-0.7
GPL-DCC	0.0	0.0	-0.7	0.0	0.0	-0.7

The fixed opex costs are modelled as a percentage of the set-up costs. The outputs therefore follow the same pattern as the set-up costs above. The fixed opex is therefore lower for the two GPL options than the respective EC&R options. Also, as for capex, the EMP back-end options have lower fixed opex than those with DCC. The difference reflects the larger amount of incremental changes required in

terms of documentation, training, and system features, when delivering a whole new communication platform like DCC compared to the already-established EMP platform.

The net change in variable opex is driven primarily by changes in agent handling time. In all cases, the variable opex figures of retail CPs have a negative net cost, which represents a cost saving over the existing switching arrangements. The cost savings for Tier A and Tier B CPs are rounded to zero in the table as the figures are less than £50,000. We assume that there is no change in variable opex for TPIs and the wholesale providers (BT Wholesale and Openreach) as they do not have CSAs interacting with retail customers.

The reduction in variable opex for the GPL front-end options is more than double that of the EC&R options. This is due to the greater potential savings in agent time that can be achieved. The GPL front-end enables a reduction in the number of customers contacting the LP for ceasing or confirming their switching after placing the order with the GP. These savings are larger than the reduction of the agent time achieved in the EC&R front-end through the additional termination channels.

4.1.3. Summary and 10-year Net Present Cost

The table below summarises the above outputs at an industry level. In addition to the capex and changes in opex, a discounted cash flow is summed to give the 10-year net present cost (NPC) in the final column.

In the base case, we discount the future annual opex using the Spackman discount rate methodology as opposed to a standard discount rate. This methodology factors in the cost of the capital used for financing the delivery of identified process and system changes for each one of the alternative options (i.e. the set-up costs). This cost is annuitised over the same time period considered for the NPC analysis. Then, all costs, both annuitised financing costs and opex, are discounted as per the standard discount rate as recommended by the HM Treasury Green Book.

Figure 10. ***Total costs to industry under base case conditions (£m)***

Option	Capex	Fixed Opex	Variable Opex	Total Opex	10-year NPC
EC&R-EMP	11.4	2.1	-0.3	1.8	29.9
EC&R-DCC	12.3	2.2	-0.3	1.8	31.7
GPL-EMP	10.6	2.0	-0.7	1.2	23.9
GPL-DCC	11.4	2.0	-0.7	1.3	25.7

On a 10-year basis, the net present cost (NPC) to industry ranges from £23.9 million to £31.7 million depending on the option.

The two GPL front-end options – GPL-EMP and GPL-DCC – have the lowest NPC, at £23.9 million and £25.7 million, respectively. Compared to the EC&R front-end options, the GPL options are less expensive to implement and produce greater savings in variable opex.

Of the two GPL options, the one with the EMP back-end has the lower NPC. This is a result of the lower effort estimates for developing the EMP back-end versus the DCC back-end. This results in both a lower capex cost and a lower fixed opex for the EMP option.

As previously noted, the development cost estimates are based largely on Cartesian's assumptions of the effort required by CPs to implement new processes and systems. The sensitivity of the NPC to the capex is analysed in Section 4.2.1, below.

The reduction in variable opex is dependent on the number of switchers that use the alternative switching processes. For the GPL options, there is a saving in CSA time as a result of fewer calls to the LP. Under the EC&R options, the customer needs to contact both CPs (GP and LP) to switch services. The reduction in agent handling time is achieved by providing new termination channels to the customer since these channels – online portal and IVR – don't involve agent time. The sensitivity of the opex reduction to the number of switches is analysed in Section 4.3.2.

4.2. Sensitivity Analysis

To understand the sensitivity of the model outputs to changes in the input assumptions, we modelled three scenarios with adjustments to the input assumption.

1. Adjust the **capex** by +/- 20%

The capex costs represent the upfront set-up cost for implementing the changes to CP systems and processes.

In the base case assumptions, the capex costs also drive the fixed opex costs for maintaining the systems and processes in-life. For the purposes of this sensitivity adjustment, we assume there is no change to the fixed opex.

2. Adjust the **number of switches** by +/- 20%

Decreasing the number of switches reduces the magnitude of the net change in variable opex as this is primarily driven by the reduction in CSA time on the phone with customers. Increasing the number of switches has the opposite effect.

3. Apply the **standard discount rate**

The base case discounts the future costs using the Spackman discount rate methodology, which factors in the cost of the capital used for financing the delivery of the identified process and system changes for each one of the switching scenarios (i.e., the capex). To understand the sensitivity of the model output to the choice of discounting methodology, we run an alternative scenario that does not include the cost of capital. This alternative approach discounts only the future annual opex using a standard discount rate as recommended by the HM treasury Green Book.

4.2.1. Sensitivity 1: Adjusting Capex by +/- 20%

The tables below show the variation of capex costs between the base case and the two sensitivity scenarios under analysis: +/- 20% capex.

Figure 11. ***Adjusted set-up cost assumptions (£m)***

Capex	EC&R EMP	EC&R DCC	GPL-EMP	GPL-DCC
Base	11.4	12.3	10.6	11.4
Capex +20%	13.7	14.8	12.7	13.7
Delta to base case	2.3	2.5	2.1	2.3
Capex -20%	9.1	9.8	8.4	9.2
Delta to base case	-2.3	-2.5	-2.1	-2.3

Rounding may have an impact on the calculated deltas

As shown in the table below, a 20% increase of the assumed capex increases the 10-year NPC between £2.7 million and £3.2 million across the four options. The options using the EMP back-end are less impacted, since these are less capital-intensive compared to the DCC back-end.

The opposite effect is observed when capex is reduced by 20%. The 10-year NPC figure decreases between £2.7 million and £3.2 million across the four options. The options with the DCC back-end exhibit the largest reduction in 10-year NPC, however they remain more expensive than the options with the EMP back-end.

Figure 12. ***Industry total 10-year NPC with adjusted capex assumptions (£m)***

10-year NPC	EC&R EMP	EC&R DCC	GPL-EMP	GPL-DCC
Base	29.9	31.7	23.9	25.7
Capex +20%	32.8	34.8	26.7	28.6
Delta to base case	2.9	3.2	2.7	2.9
Capex -20%	27.0	28.5	21.2	22.8
Delta to base case	-2.9	-3.2	-2.7	-2.9

Rounding may have an impact on the calculated deltas

4.2.2. *Sensitivity 2: Adjusting the number of switches by +/- 20%*

Increasing the number of switches by 20%, increases the total volume of switches from 884,000 (baseline) to more than 1 million switches. This has a direct impact in the net change of the variable opex. The capex and the fixed opex remain unchanged because they are not dependent on the volume of switches.

The increase in the number of switches increases the potential cost savings achieved with both the EC&R and GPL front-end options. This reduces the 10-year NPC figures by £0.6 million and £1.3 million, respectively. The GPL front-end options exhibit greater reductions compared to the EC&R options, more than two times – reflecting the larger cost saving per switch of the GPL options compared to the EC&R.

In contrast, reducing the volume of switches has the opposite effect. This reduces the total volume of switchers from 884,000 (baseline) to around 700,000. With fewer switches, the net opex reductions are lower and consequently the 10-year NPC is higher. The variation in 10-year NPC is similar to above, ranging from £0.6 million to £1.3 million, for the EC&R and GPL respectively, which shows the linear impact of the number of switches in the NPC.

Figure 13. ***Industry total 10-year NPC with adjusted number of switches (£m)***

10-year NPC	EC&R EMP	EC&R DCC	GPL-EMP	GPL-DCC
Base	29.9	31.7	23.9	25.7
+20%	29.3	31.1	22.7	24.4
Delta to base case	-0.6	-0.6	-1.3	-1.3
-20%	30.5	32.3	25.2	27.0
Delta to base case	0.6	0.6	1.3	1.3

Rounding may have an impact on the calculated deltas

4.2.3. Sensitivity 3: Applying the standard discount rate methodology

In the base case, we discount the future costs using the Spackman discount rate methodology, which factors in the cost of the capital used for financing the delivery of the changes (i.e. the set-up costs). In this sensitivity test, we do not include the cost of capital in the NPC calculation; the NPC instead discounts only future opex costs using a standard discount rate.

Excluding the cost of capital from the discounted cost calculation reduces the NPC by £3.0 million to £3.5 million, resulting in NPCs in the range of £21 million to £28 million. The NPC reduction is lower for the options with the EMP back-end versus those with the DCC back-end due to the EMP options having lower capex, and hence lower financing costs. Overall, the standard discount rate methodology causes the range of the NPC outputs (i.e. the difference between the highest and lowest values) to decrease slightly, from £7.7 million to £7.2 million.

Figure 14. ***Industry total 10-year NPC using the standard discount rate (£m)***

10-year NPC	EC&R EMP	EC&R DCC	GPL-EMP	GPL-DCC
Base	29.9	31.7	23.9	25.7
Standard Rate	26.7	28.2	21.0	22.5
Delta	-3.2	-3.5	-3.0	-3.2

Rounding may have an impact on the calculated deltas

5. Tier A CPs and TPI Cost Assessment / Manual Option

5.1. Base Case Model Outputs for Tier A and TPIs

In the preceding sections we set out our methodology and cost assessment results based on an automated communications interface.

Figure 15 shows the capex and fixed opex costs for Tier A CPs and TPIs for the scenario where activities are automated.

Figure 15. ***Total costs to industry under base case conditions for Tier A CPs and TPIs (£m)***

	Tier A CPs		TPIs		Total
Option	**Capex**	**Fixed Opex**	**Capex**	**Fixed Opex**	**10-year NPC**
EC&R-EMP	0.5	0.1	1.2	0.2	5.1
EC&R-DCC	0.6	0.1	1.5	0.2	5.9
GPL-EMP	0.5	0.1	1.0	0.2	4.5
GPL-DCC	0.6	0.1	1.3	0.2	5.3

The fact that the number of cross platform switchers to and from Tier A CP's may be low may mean an automated process is not the most cost efficient approach. Therefore, we have considered at a high level how a manual back-end process might work in order for Tier A CPs to support the front end processes set out in the specifications. The following description is a high level view of how EC&R and GPL could potentially work without an automated inter CP platform.

5.2. Manual Back-End Process

The following two process descriptions only represent inter CP communication activities between the GP and LP. They do not include all of the other front end activities e.g. sending of notification letter to consumers.

The communication between GP and LP would be based on manual emails/ spreadsheets – though providers could also still call each other.

5.2.1. GPL

The consumer would contact the GP to place a cross-platform switch order, and the GP's customer service agent (CSA) would place an order internally as normal. The CSA would then record the request in their own individual spreadsheet. Any other switch requests recorded that day by other CSAs would be compiled into a master document[13]. The master document would capture the customer's account id, the services due to be ceased and the planned cease (provision) date.

[13] The master document would incorporate all the switch requests from all the gaining provider's CSAs that day.

The GP's master document would then be sent to the LP at the close of the business day. Once the LP received the daily spreadsheet, the relevant CSA would, alongside any other transfer requests from GPs, carry out the appropriate asset validation checks and then organise the relevant customer's lines to be ceased.

The GP would organise the services to be provisioned on the planned date. The GP would send the LP updates on any delays to the planned provision date – these would be done as soon possible, or the end of each day at latest.

Once the GP was satisfied that the new services were up and running, they would send a final confirmation to the LP, to allow them to cease the customer's old services.

5.2.2. EC&R

The consumer would contact the GP to place a cross-platform switch order, and the GP's customer service agent (CSA) would place an order internally as normal.

The CSA would offer to co-ordinate with the LP, though explain that the customer must arrange cancellation of relevant services directly with the LP.

The consumer would be given two working days to cancel with the LP. After two working days, the GP would email the LP to ask if the consumer has cancelled their services. The LP will reply with an answer. If the answer is yes, the GP will confirm the planned cease (provision date) to the LP.

The GP would organise the services to be provisioned on the planned date. The GP would send the LP updates on any delays to the planned provision date – these would be done as soon possible, rather than at the end of each day.

Once the GP was satisfied that the new services were up and running, they would send a final confirmation to the LP, to allow them to cease the customer's old services.

5.2.3. Limitations

We have not assessed the full extent of potential risks associated with a manual process and how these might be mitigated. However, our initial view is that there are the following limitations associated a manual process:

- Asset validation will be offline. This may cause the GP to go back to the consumer post initial contact if the validation fails.
- Risk that the delay updates don't arrive on time, potentially leading to double-payment or eventually service loss.

5.3. Cost savings as a result of a manual back-end process

Figure 16 shows potential cost savings for the scenario where back-end activities are manually executed and no inter-CP comms channel is deployed by Tier A CPs as per base case. Costs for Tier A CPs are mainly related to process development and training to implement the front end processes as set out in Table 5.

Figure 16. ***Variation between options (£m)***

10-y NPC	EC&R EMP	EC&R DCC	GPL-EMP	GPL-DCC
Front end and Back end	5.1	5.9	4.5	5.3
Front end only	3.1	3.1	2.5	2.5
Delta	-2.0	-2.9	-2.0	-2.9

Figure 17 shows the 10-year NPC at an industry level including the cost savings from not implementing automated BE processes for Tier A CPs.

Figure 17. ***Total costs to industry excluding automated back-end for Tier A (£m)***

Option	Capex	Fixed Opex	Variable Opex	Total Opex	10-year NPC
EC&R-EMP	10.7	2.0	-0.3	1.6	27.9
EC&R-DCC	11.2	2.0	-0.3	1.7	28.8
GPL-EMP	9.8	1.8	-0.7	1.1	21.9
GPL-DCC	10.4	1.9	-0.7	1.1	22.9

5.4. Additional costs of a manual process

In addition to the cost savings outlined in Figure 16 above, there are some costs associated with the manual process. These would reduce some of the cost savings from not implementing the automated process.

There would need to be some upfront set up costs by some Tier B and C CPs (mainly Virgin) to send and receive manual order requests. These include:

1. Development of new processes and document templates with Tier A CPs
2. Training for some Tier B and C CPs CSAs (mainly Virgin)

There would be opex costs mainly in terms of agent time on the LP and GP for all CPs:

3. To process order requests
4. To validate services and associated queries as it will not be possible in real-time
5. To support customers with issues during the switch as the process is likely to be less reliable than the proposed automated solutions
6. To process confirmation requests to cease services

These costs will vary subject to the number of switches. Based on the total number of lines to these CPs it is likely to be low and therefore the opex associated could be low.

6. Glossary of Terms

Abbreviation	Definition
BE	Back-end
BSS	Business Support Systems
BTW	BT Wholesale
C&R	Cease and Re-Provide
CIM	Customer Interface Management
CLI	Customer Line Identification
COM	Customer Order Management
CP	Communications Provider
CRM	Customer Relationship Management
CSA	Customer Service Agent
DCC	Direct Communication Channel
EC&R	Enhanced Cease and Re-provide
ETC	Early Termination Charges
eTOM	Enhanced Telecoms Operations Map
FE	Front-end
FTE	Full-time employee
GP	Gaining Provider
GPL	Gaining Provider Led
GPL NoT+	Gaining Provider Led (GPL) approach with enhancements to the Notification of Transfer (NoT) process
LP	Losing Provider
IS	Implication of Switching
NoT	Notice of Transfer
NPC	Net Present Cost
OSS	Operations Support Systems
SOM	Service Order Management
TAM	Telecom Applications Map
T&C	Terms and Conditions
TPI	Third Party Integrator
WACC	Weighted Average Cost of Capital

APPENDIX A. Summary of Impacted Process and Systems

The matrix below provides a summary of the processes and systems which would be impacted by each of the front-end and back-end changes.

Figure 18. ***Summary of Impacted Processes and Systems***

		Major Changes							
		Front-End					Back-End		
		IS to monthly bill	Termination Channels	Record of Consent	FE Order Requests'	CPs communication letters with IS/ETC	Asset Validation	BE Order Requests	Switch Completion Confirmation msg.
Process	CRM Support & Readiness	X	X	X	X	X	X	X	X
	Order Handling		X	X	X		X		
	Service Configuration and Activation		X	X	X	X	X	X	X
	Customer Interface Management		X	X	X		X		
	Bill Invoice Management	X	X		X				
	SM&O Support & Readiness				X				
Systems	Channel Sales Management			X	X				
	Knowledge Management			X					
	Customer Information Management		X	X	X		X		
	Customer Self-Management		X	X	X				
	CSR Toolbox			X	X		X		
	Customer Order Management		X		X	X	X	X	X
	Service Order Management		X		X	X	X	X	X
	Service Inventory Management				X				
	Partner Management						X	X	X
	Customer Retention & Loyalty		X						
	Bill Calculation	X	X	X	X				
	Transactional Documentation Production					X			
	Application Integration Infrastructure						X	X	X

APPENDIX B. Delivery Effort Estimates

Figure 19. ***Process Delivery Effort Estimates (Days per CP in each Tier)***

	GPL EMP			GPL DCC			EC&R EMP			EC&R DCC		
	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C
CRM Support & Readiness	3	16	50	3	22	50	3	21	55	3	28	55
Order Handling	3	14	46	3	14	46	3	31	62	3	31	62
Service Configuration and Activation	3	25	63	3	29	63	3	29	71	3	36	71
Customer Interface Management	3	14	46	3	14	46	3	27	54	3	27	54
Bill Invoice Management	0	0	3	0	0	3	0	9	18	0	9	18
SM&O Support & Readiness	0	0	3	0	0	3	0	2	3	0	2	3

Figure 20. ***CSA Training Estimates (Training days per CSA in each CP Tier)***[14]

	GPL EMP			GPL DCC			EC&R EMP			EC&R DCC		
	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C
CRM Support & Readiness	1	1	2	2	2	2	1	1	2	2	2	2
Order Handling	1	1	1	1	1	1	1	1	1	1	1	1
Service Configuration and Activation	1	1	2	2	2	2	2	2	3	2	2	3
Customer Interface Management	1	1	1	1	1	1	1	1	1	1	1	1
Bill Invoice Management	0	0	0	0	0	0	0	0	0	0	0	0
SM&O Support & Readiness	0	0	0	0	0	0	0	0	0	0	0	0

[14] Figures shown for Tier C represent BT, Sky and TalkTalk. Virgin Media is assumed to have higher costs as it does not already interface to EMP and is not within scope of the GPL NOT+ process.

Figure 21. ***System Delivery Effort Estimates (Days per CP in each Tier)***[15]

	GPL EMP			GPL DCC			EC&R EMP			EC&R DCC		
	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C	Tier A	Tier B	Tier C
Channel Sales Management	0	3	9	0	3	9	0	3	9	0	3	9
Knowledge Management	0	0	3	0	0	3	0	0	3	0	0	3
Customer Information Management	0	43	88	0	43	88	0	47	96	0	47	96
Customer Self-Management	0	10	22	0	10	22	0	15	33	0	15	33
CSR Toolbox	0	43	88	0	43	88	0	43	88	0	43	88
Customer Order Management	0	30	122	0	64	128	0	35	133	0	69	139
Service Order Management	0	56	122	0	64	128	0	61	133	0	69	139
Service Inventory Management	0	12	25	0	12	25	0	12	25	0	12	25
Partner Management	0	40	89	0	48	95	0	40	89	0	48	95
Customer Retention & Loyalty	0	0	0	0	0	0	0	2	3	0	2	3
Bill Calculation	0	3	7	0	3	7	0	9	17	0	9	17
Transactional Documentation Production	0	0	0	0	0	0	0	0	0	0	0	0
Application Integration Infrastructure	0	40	89	0	48	95	0	40	89	0	48	95

[15] Figures shown for Tier C represent BT, Sky and TalkTalk. Virgin Media is assumed to have higher costs as it does not already interface to EMP and is not within scope of the GPL NOT+ process.

Figure 22. ***Additional hardware costs (£ per CP per Tier)***[16]

	GPL EMP		GPL DCC		ECR&R EMP		EC&R DCC	
	Tier B	Tier C	Tier B	Tier C	Tier B	Tier C	Tier B	Tier C
Channel Sales Management	0	2,500	0	2,500	0	2,500	0	2,500
Knowledge Management	0	2,500	0	2,500	0	2,500	0	2,500
Customer Information Management	0	2,500	0	2,500	0	2,500	0	2,500
Customer Self-Management	0	2,500	0	2,500	0	2,500	0	2,500
CSR Toolbox	0	2,500	0	2,500	0	2,500	0	2,500
Customer Order Management	0	0	0	0	0	0	0	0
Service Order Management	0	0	0	0	0	0	0	0
Service Inventory Management	0	0	0	0	0	0	0	0
Partner Management	0	0	0	0	0	0	0	0
Customer Retention & Loyalty	0	0	0	0	0	0	0	0
Bill Calculation	0	0	0	0	0	0	0	0
Transactional Documentation Production	0	0	0	0	0	0	0	0
Application Integration Infrastructure	0	0	20,000	40,000	0	0	20,000	40,000

[16] Note: By definition, Tier A CPs do not own and operate their own systems. Hence hardware costs for Tier A CPs are zero.

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