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Bottom-up review of the efficiency of the IT function of Western Power Distribution.

A Report for Western Power Distribution

5 June 2013

Private and Confidential

This report has been prepared on the basis of the limitations set out in the engagement letter and the matters noted in the Important Notice From Deloitte on page 1.

Contents

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Executive Summary

Benchmarking Western Power Distribution's IT costs in the context of RIIO

Western Power Distribution group of companies ("**WPD"**) is currently undergoing a regulatory review by Ofgem under its new RIIO framework and is required by May 2013 to submit a 'well justified business plan' as part of that review. Typically price controls by Ofgem, and therefore the business plan, require the regulated company to increase its productivity to catch up to some benchmark representing an efficient comparator. This report provides analysis of WPD's comparative efficiency to inform its business plan, focusing on non-operational IT costs of activities undertaken by the Information Resources ("**IR**") department.

The IR department is responsible for IT across 70 different WPD sites and nearly 6,000 users. Reporting to the Finance Director and led by the Information Resources Manager and five members of the management team, the overall IR department consists of 81 full-time WPD staff based primarily in Plymouth with an annual budget of £25.2 million (excluding telemetry/private field network). The department aims to deliver a "no frills" service (for example there is no IT Help Desk, and no internet access from users' desk top), but a highly resilient and available IT function based on a lean structure, without reliance on contractors or outsourcing. WPD's IR department works closely with the business to deliver IT systems that directly contribute to WPD's business performance.

This provides a bottom-up benchmarking review of WPD's DNOs against wider industry peer groups in a number of leading IT benchmarking datasets, using adjusted 2011/12 data. In the period used for the top-down analysis WPD comprised South Wales and South West DNO; its purchase of the two Central Networks DNOs in the Midlands occurred in 2011.

The bottom-up benchmarking analysis provides an assessment of WPD's current cost efficiency based on key unit cost ratios and other KPIs using adjusted 2011/12 data. It provides a view of non-operational IT costs by the main IT service towers (which consist of data centres, end user computing, network and applications) and for key IT services. WPD's 2011/12 costs are combined across all four DNOs and have been adjusted to reflect an expected business-as-usual level of expenditure following transition costs incurred in the integration of the two Central Network DNOs into the WPD group. The bottom-up benchmarking focuses on non-operational IT costs given that operational IT costs are likely to be specific to DNO activities and so not comparable to non-DNO peers.

The bottom-up benchmarking provides an assessment that is intended to be actionable of where in the non-operational IT costs any efficiency or inefficiency may arise. It is also able to provide a current view on efficiency.

Results

The bottom-up analysis shows that for the combined non-operational IT costs of the four WPD DNOs, significant efficiency gains have been achieved in 2011/12 as compared with pre-merger

costs for WPD's two DNOs in 2009/10. Bottom-up benchmarking by IT service tower shows costs that are at or below average levels where there is no DNO-specific factor driving up costs.

- WPD has been able to reduce most key unit cost ratios and improve most KPIs following the acquisition of the Central Network DNOs. This indicates that the historical inefficiency of the ex-Central Networks' DNOs has been addressed in the 2011/12 costs.

- The post merger WPD IT staff costs are efficient compared to peers. In particular, the post merger WPD applications staff day rates are average compared to industry functional day rates within the same geographical area but as WPD is not using contractors or outsourcing for most of its IT services (excluding Mainframe services), overall day rates and personnel costs are low.

- The post merger WPD server costs (data centre and hosting) are average overall compared to non-DNO peers. This is achieved by low staff costs given relatively high hardware and software costs to meet the requirements of a DNO.

- The post merger WPD end user computing costs are high compared to non-DNO utility peers. However, this could be due to ENMAC, specialist operational hardware and software, pushing up costs by up to £2m per year (circa 27% of the overall end user computing cost) which, when allowed for, leaves WPD at or below average comparable costs.

- The post merger WPD network costs are high compared to non-DNO utility peers. This could be due to WPD's resilience policies, which drive high capacity and bandwidth requirements that in turn push network cost up.

The bottom-up benchmarking results are supported by a separate top-down efficiency analysis undertaken by Deloitte, which found that the post-merger WPD should be considered efficient with regard to non-operational IT costs. This analysis is presented in Deloitte (2013a): "Comparative efficiency of the IT function of Western Power Distribution".

1 Introduction

1.1 Background and objectives

Western Power Distribution ("**WPD**") which comprises four electricity Distribution Network Operators ("**DNOs**"), covering the Midlands, the South West and South Wales, is currently undergoing a regulatory review by Ofgem for the purposes of setting new network price controls. This review is being undertaken under the new RIIO model (Revenue = Incentives + Innovation + Outputs) and its resulting price controls will commence in April 2015 for a period that is likely to be eight or nine years.

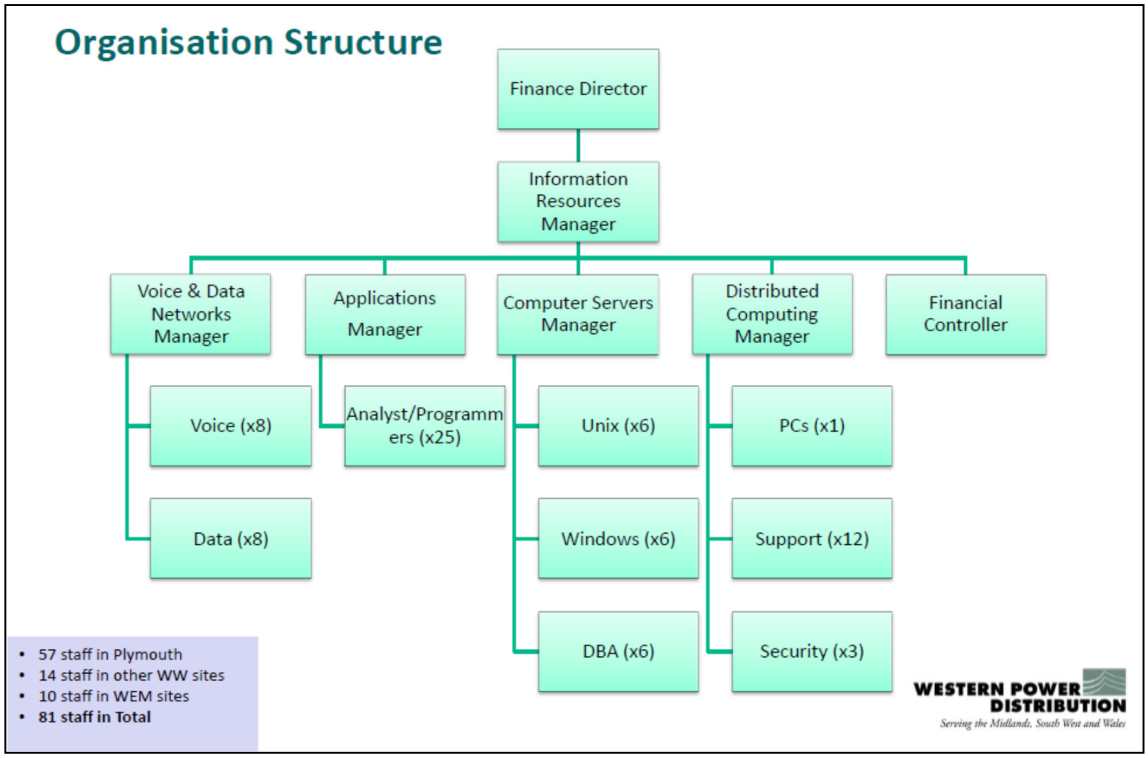
Under the RIIO-model, regulated companies are required by May 2013 to submit to Ofgem a 'well-justified business plan'. This will include cost projections for the WPD supported by analysis of cost drivers and, where appropriate, cost benchmarking. Ofgem will itself assess the 'efficient costs' in the companies' business plans using a range of different levels of analysis.

In this context, the objective of this report is to provide a bottom-up benchmarking assessment of the relative efficiency of WPD's non-operational IT activities undertaken by the Information Resources (IR) department.

The IR department is responsible for IT across all 70 sites in the four DNOs. Headed up by the Information Resources Manager and five members of the management team as shown in Figure 1, the overall IR department consists of 81 full-time WPD staff based primarily in Plymouth, with no contractors and outsourcing, supporting 5,823 geographically-dispersed users. It has an annual budget in total of £25.2 million (excluding telemetry / PMR). WPD has set up the IR department using a relatively flat and lean structure. For example there is no traditional 'helpdesk' function within the department. However, although the scope of IR requirement has grown significantly since the merger with the two Midlands DNOs the size of the IR department has not grown proportionally[1].

[1] The bottom-up benchmarking results in Section 4.1 highlight the significant economies of scales gained post-merger.

Figure 1: WPD IR department organisation structure



Source: WPD

This report provides an assessment of the relative cost efficiency of the non-operational IT functions through a bottom-up benchmarking analysis with non-DNOs where the comparator businesses are similar in size, scale and complexity to WPD.

1.2 Structure of this report

This report is structured as follows:

- Section 2 sets out the methodology used for the top-down and bottom-up analyses.
- Section 3 describes the data used and data limitations for the analyses.
- Section 4 provides the results and findings from the analysis.
- Finally, Section 5 draws overall conclusions on bottom-up benchmarking WPD's IT function.

2 Methodology

This section sets out the framework for our analysis for both the bottom-up approach.

The bottom-up benchmarking analysis provides an assessment of WPD's current cost efficiency based on key unit cost ratios and other KPIs. It provides a view of IT costs by the main IT service towers (which consist of data centres, end user computing, network and applications) and for key IT services. This provides an assessment that is intended to be actionable of where in the non-operational IT costs any efficiency or inefficiency may arise. The bottom-up analysis is also able to provide a current view on efficiency. The top-down analysis complements this by providing a view of WPD's historical comparative efficiency performance.

2.1 Bottom-up benchmarking of unit costs and KPIs

2.1.1 Background

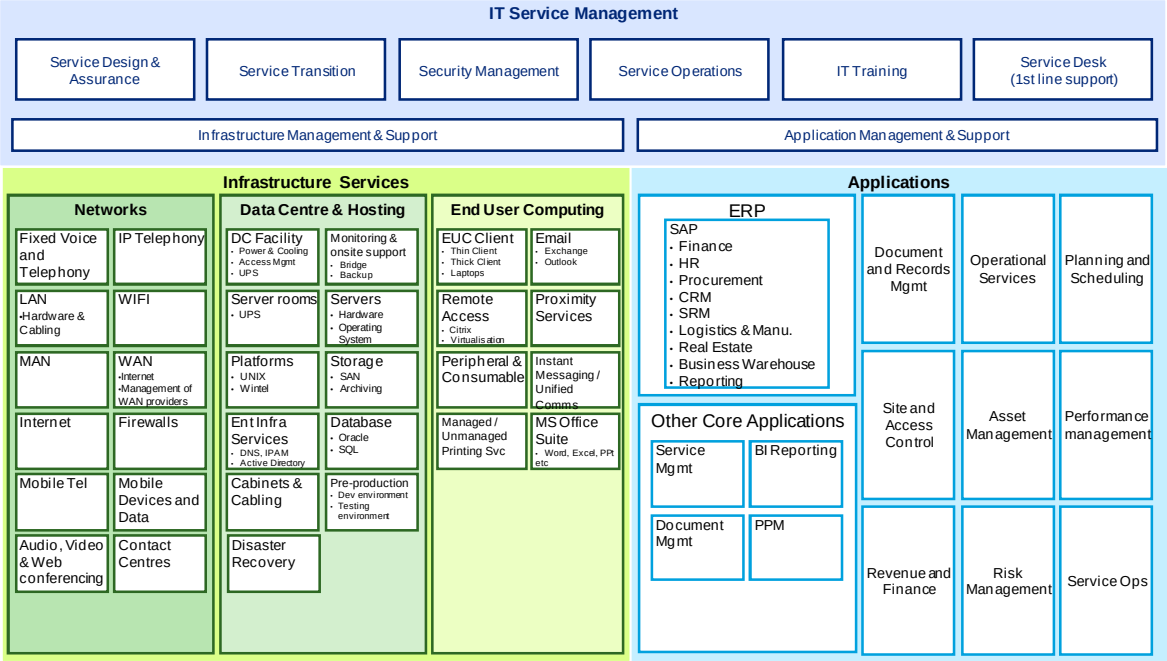
In the bottom-up analysis, WPD's IT costs are benchmarked against non-DNOs in two different ways. First, industry peers are benchmarked by comparing overall IT costs and, second, WPD's individual IT functions are benchmarked with the IT functions of businesses organisations of similar size, scale and IT complexity to WPD.

The focus of the bottom-up benchmarking is on non-operational IT activities as defined in the Regulatory Reporting Pack ("**RRP**") guidelines. This excludes IT equipment used exclusively in the real time management of network assets such as RTU units and communication equipment receivers at the control centre. The costs of functions are specific to DNO's and so benchmarking against non-DNO's would not yield robust results.

The IT activities that remain within the scope of our analysis are grouped into five logical service towers – IT Service Management, Networks, Data Centre & Hosting, End User Computing and Applications. Figure 2 outlines how the IT components are allocated into these service towers. This grouping is used by both Gartner and Deloitte, and is consistent with the way in which WPD IT manages its IT costs. In addition, Information Technology Healthcheck (**"iTHC**"), a benchmarking firm (see Section3), provides benchmarking metrics which can be easily allocated into these IT service towers.

Due to the relatively lean organisational structure of the WPD IT department (for example there is no 'traditional' help desk), we are not able to allocate any IT cost to the IT service management tower. As a result, WPD's IT services spend is allocated into the relevant towers except IT Service Management spend which is treated as overheads and allocated across the other service towers as appropriate. Section 3.1 sets out how WPD costs are grouped into these service towers.

Figure 2: Illustration of IT service towers



Source: Deloitte Analysis

2.1.2 Data overview

Benchmarking data has been pooled from several sources to support a reasonably comprehensive approach to benchmarking which compares WPD with the overall industry, and also compares with industry peers[2] specific IT towers and price points. This allows benchmarking of WPD's overall IT costs across a wide group of businesses, whilst also benchmarking specific IT cost items. This analysis provides comprehensive perspective on WPD's costs and any areas of potential efficiencies and inefficiencies.

Deloitte's industry expertise, through Deloitte's Vendor Relationship Management team and other client experiences (from the US and UK) has further supported the benchmarking by providing a review and challenge of the data analysis, which allows for further confirmation of results and adjustments where required.

Benchmark data has been used in this report from various sources as set out below.

- *Computer Economics*, an IT research firm focusing on the strategic and financial management of information systems has provided high level IT costs, ratios and percentages. This is described in more detail in Section 2.1.3.
- *Gartner*, a global technology research firm has provided both high level IT metrics in addition to more detailed functional comparators. This is described in more detail in Section 2.1.3.

[2] The term 'industry peers' is used to refer to a group of comparator businesses deploying IT functions that is wider than electricity DNOs.

- *Information Technology Healthcheck*, a US-based IT cost benchmarking firm with a database of over 13,000 organisations in over 25 industries. iTHC allows focused and in depth IT functional benchmarking by providing precise comparison to similar industry peers (similar size, complexity and scale as WPD). This is described in more detail in Section 2.1.4.

- Deloitte industry expertise and Subject Matter Experts (**"SMEs"**) have provided specialist insight and experience into specific metrics and good practices. This is described in more detail in Section 2.1.5.

These metrics and data points are used to not only compare WPD's costs with industry peers but also to provide insight into expected ratios and percentages which can help explain the underlying costs.

2.1.3 Computer Economics / Gartner Methodology

Analysis using Computer Economics and Gartner is relatively high level and not as detailed as with iTHC. Data provided by WPD (from Section 3.1.1) is used to compare with Computer Economics and Gartner and adjusted from USD to GBP using Purchasing Power Parity ("**PPP**") (see Section 3.1.3).

2.1.4 iTHC Methodology

The iTHC data set is used by undertaking the steps shown in Figure 3 and described in more detail below.

Figure 3: iTHC benchmarking methodology

Source: Deloitte analysis

The steps in undertaking the iTHC benchmarking comprise the following:

1. Data sources are identified for WPD and comparative benchmarks to provide a like-for-like benchmarking analysis (see Section 3.1).

2. IT costs are allocated to the relevant cost categories – Data Centres and Hosting, Networks, End User Computing or Applications (there is no Help Desk, therefore this IT service tower is not accounted for in this analysis) (see Section 3.1.1).

3. Functional peers are chosen based on IT estate complexity and specific service tower metrics (see Section 3.1.2).

4. Based on the above points, iTHC results were produced for selected peers.

5. Adjustments are performed to transform iTHC benchmark data from USD to GBP for comparison with WPD (GBP) data, using PPP as defined by OECD. See Section 3.1.3.The results are then reviewed by Deloitte SMEs.

A further description of iTHC and its limitations is included in Appendix A.

2.1.5 Deloitte industry experience

Deloitte industry experience and SMEs are used to review the benchmark data and benchmark results where applicable. This provides an additional ‘sense check’ and challenge of the benchmarking results.

3 Data

This section provides an overview of the data and sources used in this report.

3.1 Data used in the bottom-up analysis

3.1.1 WPD data

WPD provided us with data in response to a series of data requests and data reviews. The data reflects the actual costs for the first eight months of FY2012 (December 2011 to July 2012) and forecast costs for the remaining four months (August 2012 to November 2012). This approach is adopted in order to account for WPD's transition from two DNOs to four DNOs following the acquisition of the two Central Networks DNOs by the Western Power Group in April 2011. This acquisition resulted in higher than usual costs for FY2011 (December 2010 to November 2011) during a transition period and a higher forecast for FY2012 to reflect residual transition activities.

To form a full FY2012 spend with only eight months of actual data, WPD has provided budgeted FY2013 costs to forecast the remaining four months. This was done as FY2013 costs represent a post-transition state and so reflects a more accurate forecast of business as usual activities than the FY2012 budget figures. As a result, FY2012 figures used in this document are eight months of actual costs between December 2011 and July 2012, and forecast of business as usual costs between August 2012 to November 2012.

This is not a reflection of the expected out-turn costs over FY2012, but provides a better view of the standard 'business as usual' costs by avoiding costs being skewed due to one-off transformational costs. In any event out-turn FY2012 costs are not available at the time of undertaking the work for this report. Table 1 provides a high level view of the cost data provided by WPD.

Table 1: Cost data provided by WPD for the bottom-up benchmarking

IT Tower	Cost data collected
Data Centre and Hosting	• Hardware costs (e.g. midrange servers, disaster recovery, storage) • Software costs (e.g. Linux licence, anti-virus) • Staff costs • Mainframe costs (e.g. IBM outsourcing cost)
Networks	• WAN transmission costs • WAN equipment costs (e.g. switches) • WAN server rooms • WAN staff costs • Mobile equipment costs (e.g. mobile devices) • Mobile tariff rates • Mobile staff costs • PBX equipment costs (e.g. VoIP, PBX systems) • PBX transmission rental and usage costs • PBX tariff rates • PBX staff costs
End User Computing	• End user device costs (e.g. desktop, laptop, handheld) • Peripheral costs (e.g. printers, scanners) • Software costs (e.g. MS Office, ENMAC) • Staff costs
Applications	• Application staff costs (e.g. application maintenance staff salaries, application development staff salaries)

Source: WPD

3.1.2 Benchmark data

Benchmark data is gathered from the sources identified in Section 0 and are categorised into general IT spend analysis and between the four in-scope IT service towers (data centre & hosting, networks, end user computing and applications).

- For general IT spend, benchmarking data is gathered for the energy and utilities industry, comparing firms of similar revenue so that a reasonable set of industry peers is compiled.

- For specific IT service tower benchmarking, the peer group is narrowed in order to provide a more robust basis for benchmarking. This is done by using specific IT variables so that organisations with similar IT complexity, IT size and IT scale are used for these benchmarks..

Table 2 provides the input variables used to select the comparative peer group for each IT service tower:

Table 2: Input variables used to determine the comparative peer group

IT Tower	IT Sub-Tower	Input variables
Data Centre and Hosting	Midrange	Server Count, Computing Scale (Small, Medium, Large), Computing Platform (Unix, Linux, Mac OS, Windows NT, Windows 2000+, OS400, Other)
	Mainframe	MIPS Count
Networks	Wide Area Data	Device Count
	Wireline	Annual Minutes
	Wireless	Device Count
	PBX	Extensions
End User Computing	Distributed Computing	User Count
Help Desk	Help Desk	Total Contact
Applications	Application Development	Function Points
	Application Support	Function Points

Source: WPD

Table 3 includes key benchmarking challenges we encountered and the corresponding responses in our analysis.

Table 3: Key challenges and responses to bottom-up benchmarking

IT Tower	Challenges	Response
Data Centre and Hosting	As mid-range hardware can vary drastically in size and scale (from small blade servers to large scale enterprise servers), it is not easy to provide like-for-like comparison with peers.	Mid-range hardware is split into the different categories of server, storage, switches (etc), along with quantities, and this allows for more in-depth analysis.
Networks	Networks tend to be bespoke and purchased as part of a large package, therefore individual specific benchmarking is not possible.	Instead of benchmarking individual cost items, we use data which is easily attainable, such as fixed voice and mobile tariffs which are benchmarked using Deloitte's industry expertise.
Help Desk	There is no traditional IT helpdesk.	This is not benchmarked.
Applications	Available KPIs require function points and WPD do not have function points.	Application salaries are benchmarked against in-house staff industry averages and contractor staff industry averages.

Source: Deloitte analysis

3.1.3 Cross-Border adjustments

Data from iTHC, Computer Economics and Gartner are provided in USD with greater emphasis on US firms. As a result, in order to provide better analysis of results, the data was adjusted from USD to GBP using PPP, a measure of the difference in price of a basket of goods between two countries. This is provided by OECD's official PPP data[3].

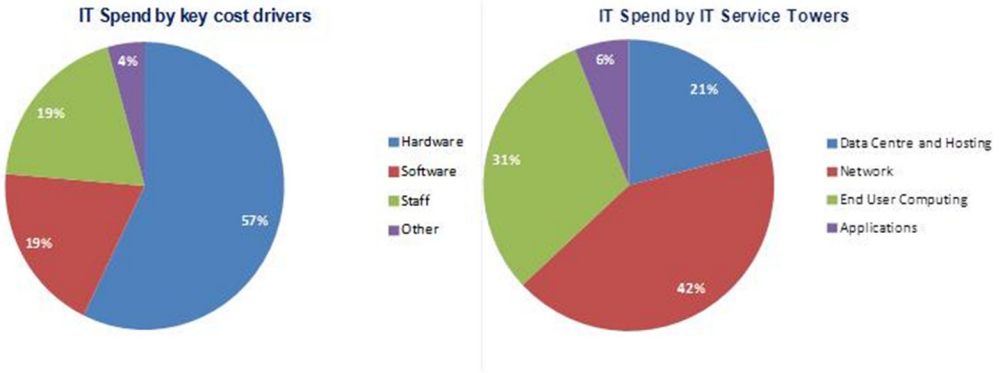
[3] http://stats.oecd.org/Index.aspx?DataSetCode=PPPGDP

4 Results: Bottom-up benchmarking

4.1 Overall IT spend

WPD non-operational IT spend for FY 2012 is £25.2M, excluding spend on private field network ("**PMR"**) around £3.5m. Figure 4 identifies the distribution of the IT spend by IT service towers and key IT cost drivers.

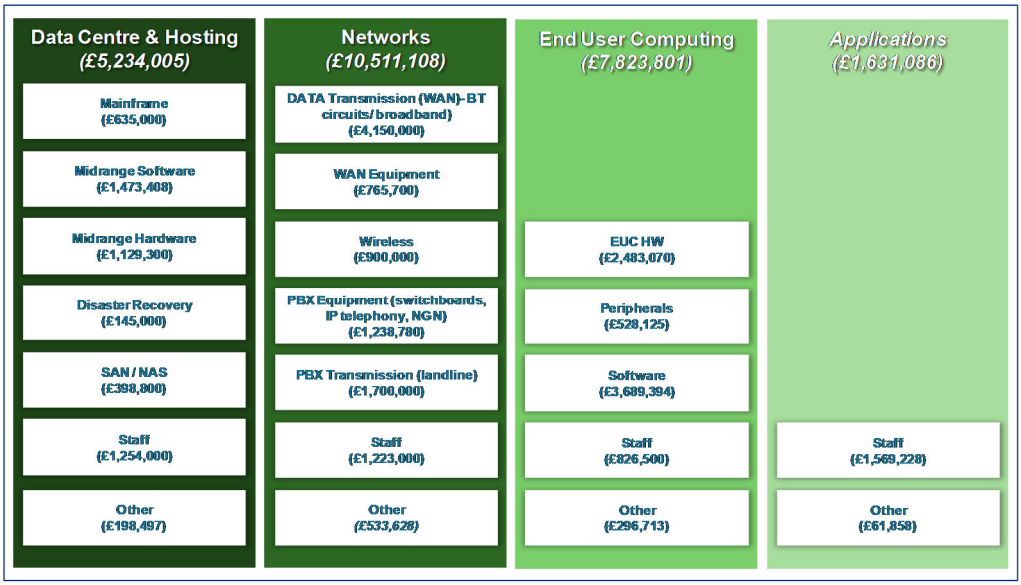
Figure 4: IT spend by key cost drivers and service towers



Source: Deloitte analysis

The spend on the IT service towers is broken down further into sub components as illustrated in Figure 5.

Figure 5: WPD in-scope IT spend FY2012[4]



Source: Deloitte analysis.

[4] WPD PMR and Telemetry spend (circa £2.5M pa) is not included in the IT spend baseline as peers do not use this technology. However, we did not compensate for alternative technologies used y peers.

Following the acquisition of the Central Networks DNOs West Midlands and East Midlands, many of the key post-merger activities to standardise and consolidate IT assets have been completed. In order to understand the post merger impact on WPD IT spend we have created 'before' and 'after' snapshots and compared key KPIs as detailed in Table 4 where positive impact is highlighted in green and negative impact is highlighted in red. Table 4 compares key KPIs between the pre-merger two DNO WPD in 2009/10 and the post-merger four DNO WPD in 2011/12. It also sets out a possible indicative explanation of such cost movements.

Table 4: Comparison of key KPIs between FY2010 and FY2012

IT Domain	KPI	FY2010	FY2012	Change	Potential explanation
General	Number of users	1,900	5,823	**+206.47%**	Number of users tripled and overall efficiency gain
General	IT Spend per User	£6,622	£4,328	**-34.65%**	Economies of scale and overall efficiency gain
Data Centre	Cost per Server (Physical)	£10,087	£11,490	**+13.91%**	Diseconomies of scale as wider geographic coverage requires more investment on resilience
Data Centre	Users per Server	7	15	**+108.05%**	Consolidation of servers that drives better ratio of server utilisation
Data Centre	Staffing Cost per Server	£3,288	£3,274	**-0.44%**	Not much of a change as staff and server growth have been steady
Data Centre	DRP Cost per Server	£277	£379	**+36.71%**	Diseconomies of scale as wider geographic requires more investment on resilience
End User Computing	Users per EUC IT Staff	211	416	**+97.02%**	Economies of scale and overall efficiency gain
End User Computing	Cost per User	£1,471	£1,293	**-12.14%**	Economies of scale and overall efficiency gain
End User Computing	Cost per Client	£1,174	£910	**-22.55%**	Economies of scale and overall efficiency gain
Networks	Cost per Connected Device	£24,833	£11,239	**-54.74%**	Economies of scale and overall efficiency gain
Networks	Hardware cost per	£2,000	£1,531	**-23.43%**	Economies of scale and overall efficiency gain
Networks	Staffing Cost per Device	£8,800	£1,228	**-86.05%**	Staff is now greater utilised / more efficient, so costs are lower, even though devices have grown

Source: Deloitte analysis

Overall, WPD has gained further cost efficiencies by leveraging from standardisation, consolidation and economies of scale. The post merger activities resulted in reduction of various unit costs across the IT service towers. For example, although the number of users, number of physical locations and circuit length increased by 206%, 56% and 158% respectively, IT spend per user decreased by 35%.

There is one exception to the above in the Data Centre and Hosting service tower. In this area the overall cost of server and the disaster recovery plan ("**DRP**") cost per server have risen. Between FY10 and F12 WPD have increased resilience across the whole IT estate. This has been achieved by switching from matched hardware ready for deployment at WPD's DR supplier's main distribution centre to deploying fully functional SANs with distributed mirroring capabilities. This has resulted in a higher overall server hardware cost, but has also led to much improved Recovery Point Objective (RPO) and Recovery Time Objective (RTO). For example, comparing WPD internal DR test results in 2010 with DR tests in 2012, there has been substantial improvement in RTO from 14 hours to 30 minutes in DUOS systems. In summary, the SAN-based solution is more expensive than the initial matched hardware solution but the substantial improvements in RPO and RTO coupled with improvements in operational capability delivers higher levels of service to the WPD business.

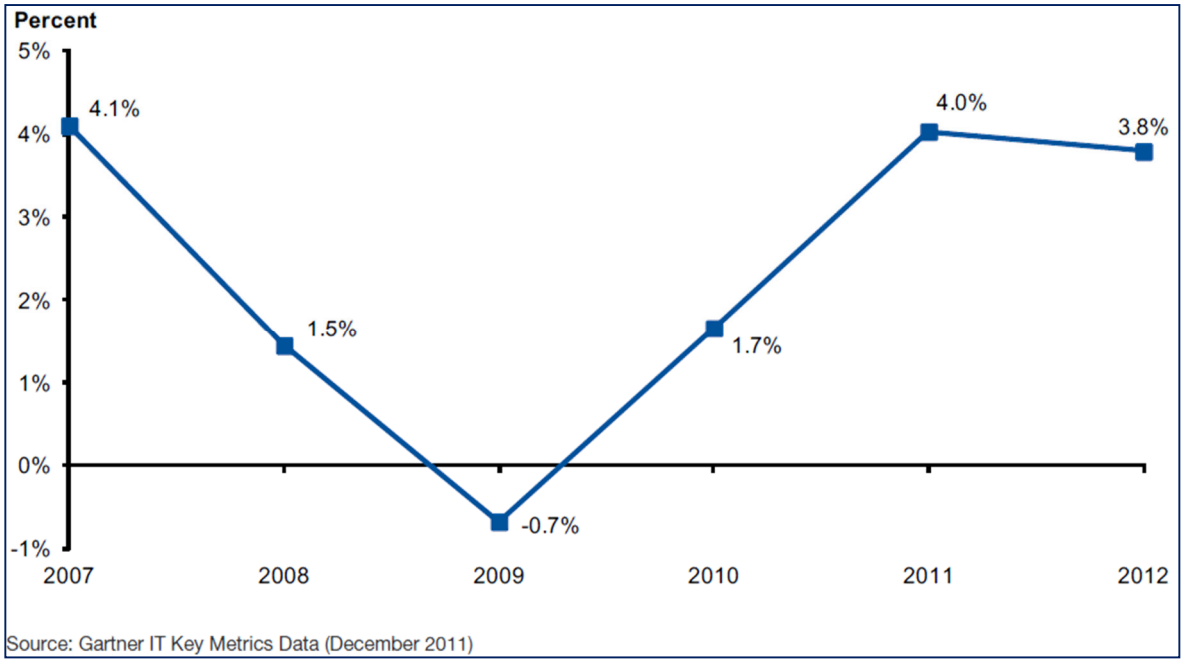
The high resilience levels also impose limits on the achievable consolidation ratio of physical servers and also dictate higher level of duplications across the IT estate.

Beyond the DR performance, WPD leads the industry on Ofgem's broad measure of customer service and the two Midlands DNOs show highest outperformance of targets in Ofgem's Interruptions Incentive Scheme. Significant performance improvements have been delivered to the Midlands DNOs also in a number of other categories, including customer call handling and customer minutes lost. Since the acquisition, there has been a 30% improvement in customer minutes lost for the Midlands DNOs and the average number of customer interruptions per month has dropped from 6.73 to 5.24. Customer service has improved also in other ways, for example the proportion of customer complaints successfully handled by the Midlands DNOs has improved by 23 percentage points since the acquisition[5].

The cost efficiencies are also significant in light of the relevant industry trend. A recent Gartner report shows that the Utilities industry average IT spending went up by 2.1% since FY2010.

[5] WPD management information

Figure 6: Utilities IT spending percent change



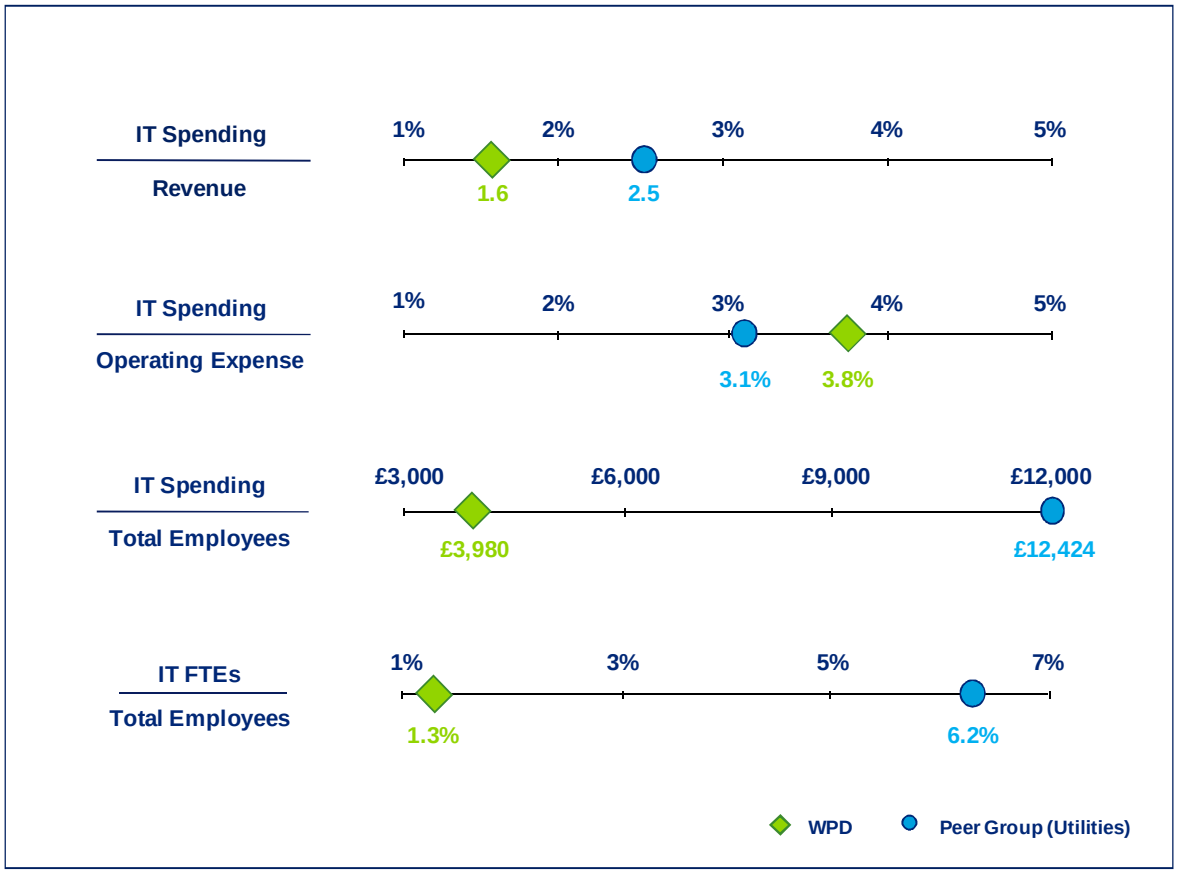
Source: Gartner IT Key Metrics Data (December 2011)

Our comparison of WPD IT spend to industry averages (see Figure 7) indicates that:

- WPD IT spend as percentage of revenue is significantly lower than its industry peers.
- However, WPD IT spend forms a larger part of operating expenditure relative to its peers. This could be due to differing strategies on hardware (for example,. WPD has a shorter refresh strategy than peers and hence higher annualised costs).
- WPD spends less on IT per employee than its peers. This is due to relatively flat and lean IT organisation and is also due to the fact that some IT services (such as the traditional 'help desk' function) is performed by the business. Costs are also driven down by the fact that WPD are not using contractors like their peers.

WPD has fewer IT FTEs per Employees than its peers. This is notable due to the fact that the peers' FTEs numbers are skewed down as they do not include IT contractors.

Figure 7: Utilities: IT Spending and IT FTEs



Source: Deloitte analysis

4.2 Data Centre and Hosting – Midrange: Server Cost

Our comparison of overall physical server cost and key physical server components to peers with similar midrange complexity and scale (see Figure 8) indicates the following:

- Spend is approximately average for businesses with similar midrange complexity and scale. However, WPD's IT costs do not include facilities cost and this could lead to lower costs recorded against IT than the actual cost if IT costs included an allocation of facilities costs.

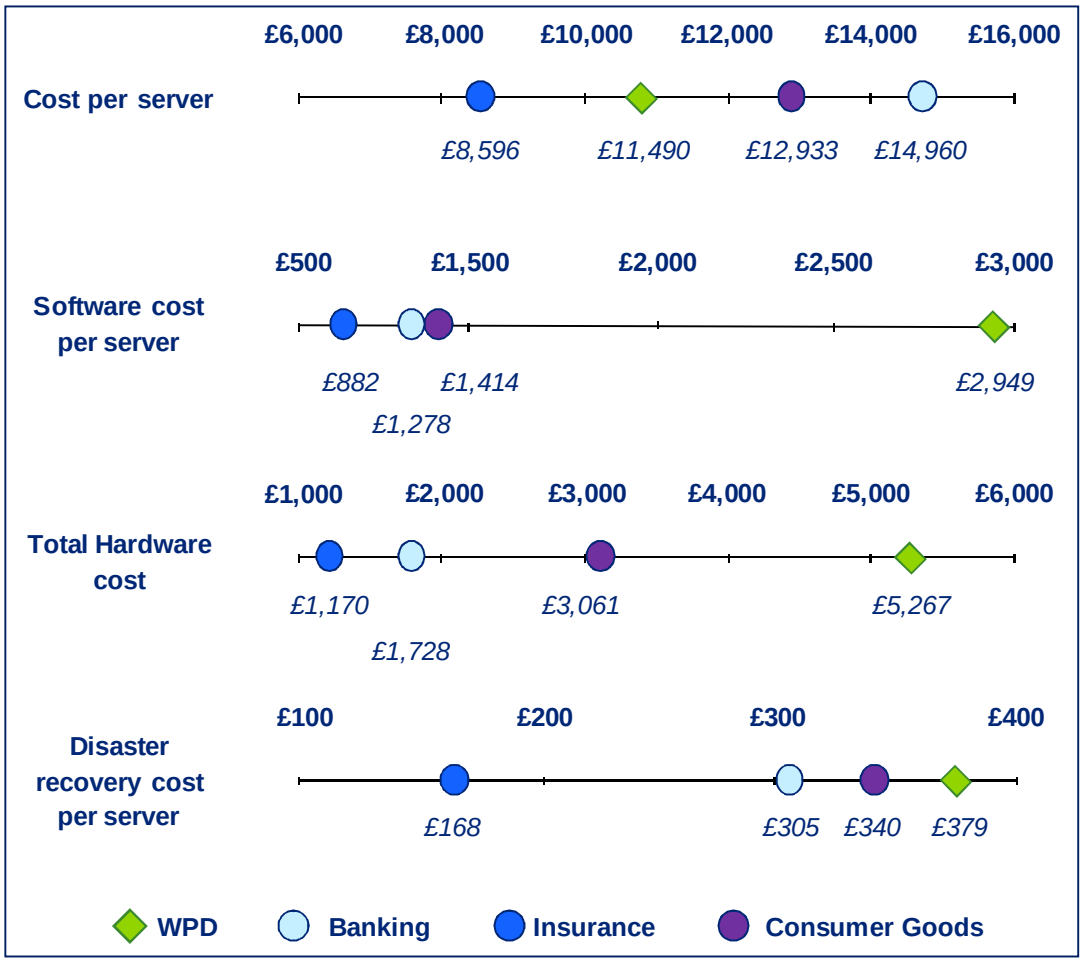
- WPD spends significantly more on software per server than similarly sized peers. This could be due to fewer commercial applications ("**COTS apps"**) and more bespoke builds. WPD also utilizes software for maintenance and automation, where these tasks would traditionally be operated by staff (for example, Oracle licence costs include licences for automated agents). The increase in the operational cost of Oracle is borne by IT but generates further business benefits, which is deemed significant by WPD's Finance Director.

- WPD spends more on hardware per server than its peers. This could be due to:

- WPD's resilience policies (such as 73TB of storage compared to 45TB industry median);
- the nature of the DNO business which requires multiple geographically dispersed sites where many servers are used as print servers or client facing servers (ENMAC prod servers) and cannot be virtualised. These limitations on physical servers consolidation brings the ratio of Operating Systems (OS) instances per physical server to 1.39 (25th percentile) while the industry median is 1.66; and,
- this also could be driven by a shorter refresh strategy than peers resulting in a higher capitalised annual cost.

- Disaster Recovery cost is higher in WPD than peers which could be due to requirements for greater availability of services.

Figure 8: Midrange: Server Cost



Source: Deloitte analysis

4.3 Data Centre and Hosting – Midrange: Staffing

Our comparison of staffing ratios to peers with similar midrange complexity and scale (see Figure 9) indicates the following:

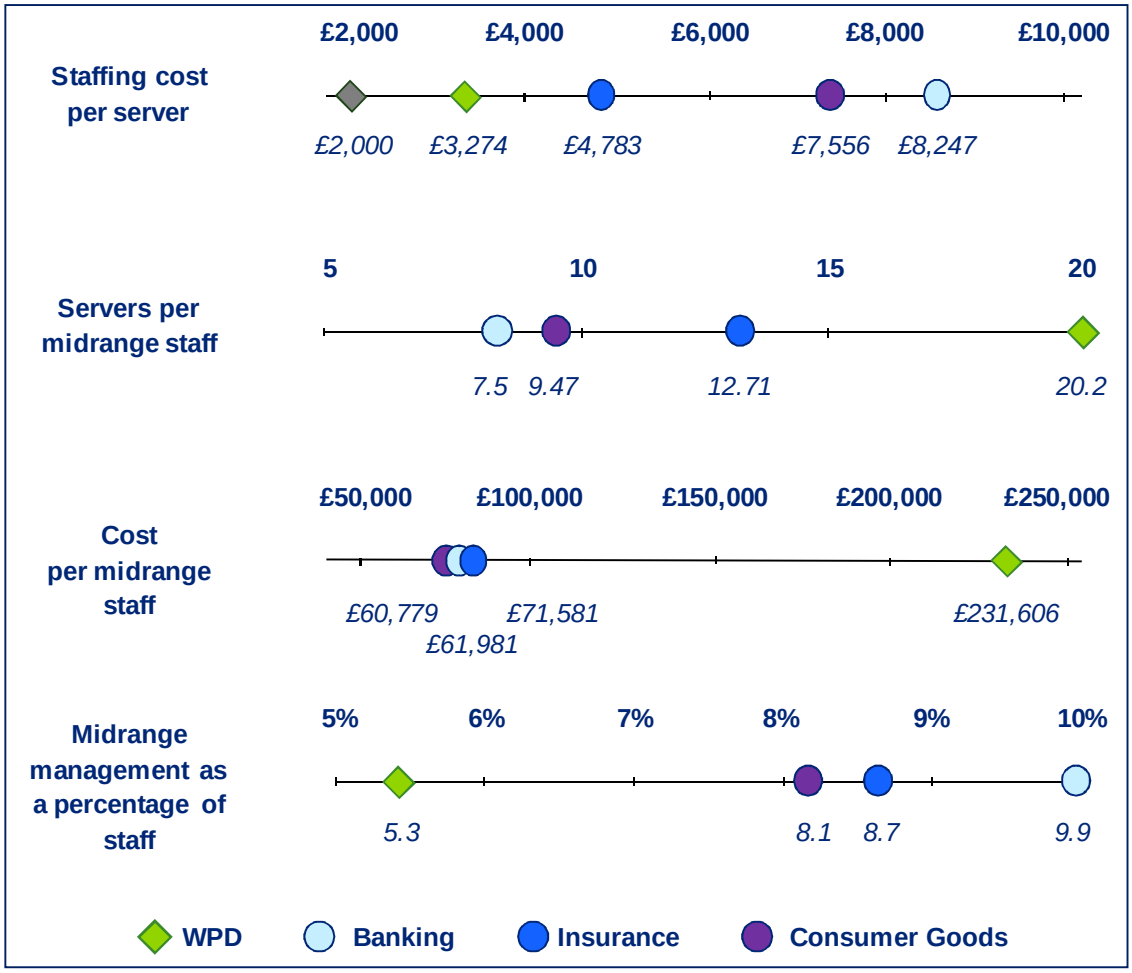
- WPD spends less on staff per server than peers, potentially due to a leaner in-house IT organisation and no 'over-inflated' spend on contractors or outsourcing. Furthermore, WPD uses software for maintenance and automation which reduces the number of staff required.

- WPD has greater number of servers per staff. This could be due to a greater number of small servers (approximately 68% of the 383 midrange servers are 'small' server less than 250 users) than peers. This is also driven by the lower ratio of physical server consolidation.

- Cost per staff is significantly higher than peers – potentially due to leaner organisation (and no contractors / outsourcing). Salaries are within our SME expectations. The ratio is also higher as the costs are high due to WPD's higher number of physical servers.

- Lower management to staff ratio than peers. WPD has a flatter hierarchical structure than peers; this could lead to greater split of responsibilities between management and staff, and therefore a lesser need for more management.

Figure 9: Midrange: Staffing



Source: Deloitte analysis

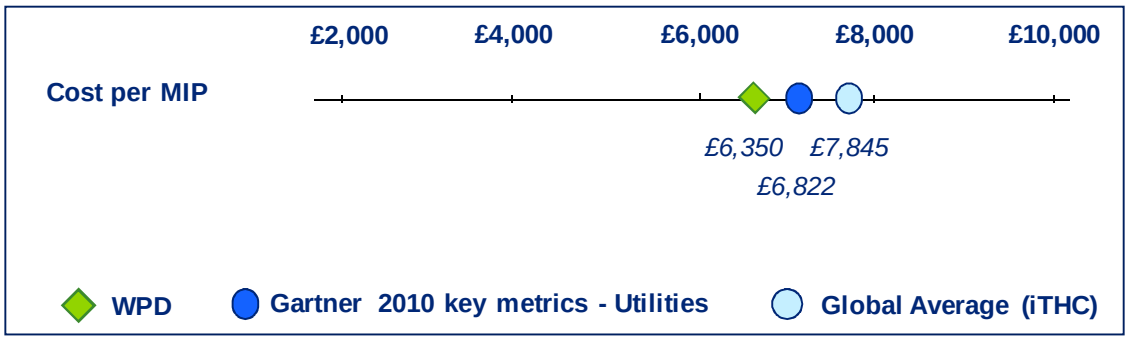
4.4 Data Centre and Hosting – Mainframe

The cost of Mainframe computing is measured by the number of MIPS (million instructions per second). MIPS is a general measure of computing performance and, by implication, the amount of work a larger computer can do: the more MIPS delivered for the money, the better the value.

Comparison of cost per MIPS to peers with similar number of installed MIPS (see Figure 10 and Figure 11) indicates that:

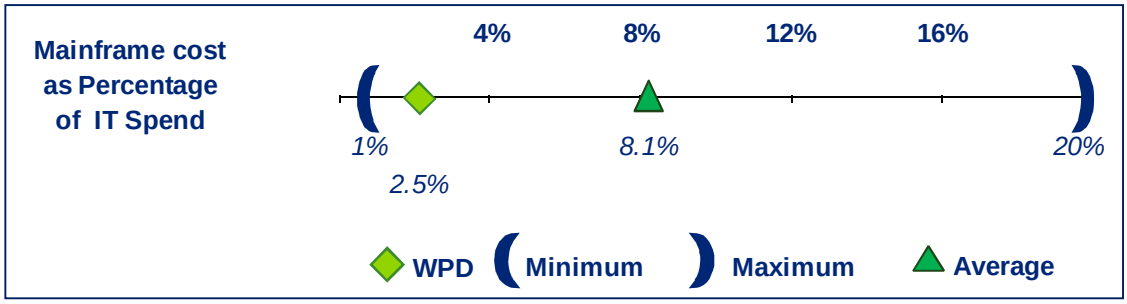
- WPD spends less on MIPS than peers with similar number of MIPS (100 to 1000 installed MIPS).
- WPD's spend on Mainframe is 2.5% of total IT Spend and below average. This low figure reflects the small scale of WPD's Mainframe environment.

Figure 10: Midrange: Mainframe: Cost per MIPS for small scale environment (Installed MIPS<1000)



Source: Deloitte analysis

Figure 11: Mainframe: Mainframe cost as Percentage of IT Spend



Source: Deloitte analysis

4.5 End User Computing– Key Costs Constituents

- Our comparison of End User Computing **("EUC")** cost to peers with similar number of users (see Figure 12) indicates the following.

- WPD's EUC cost is within the cost range found in peers. WPD are in the upper quartile of the range due to unique high hardware costs (ENMAC handhelds that are not necessarily included in peer benchmarking data) and large software catalogue. This is slightly offset by the lower staff cost due to leaner IT organisation and no use of contractors. Deloitte's experience is that costs tend to be in the range of £1,000 to £1,200 per user.

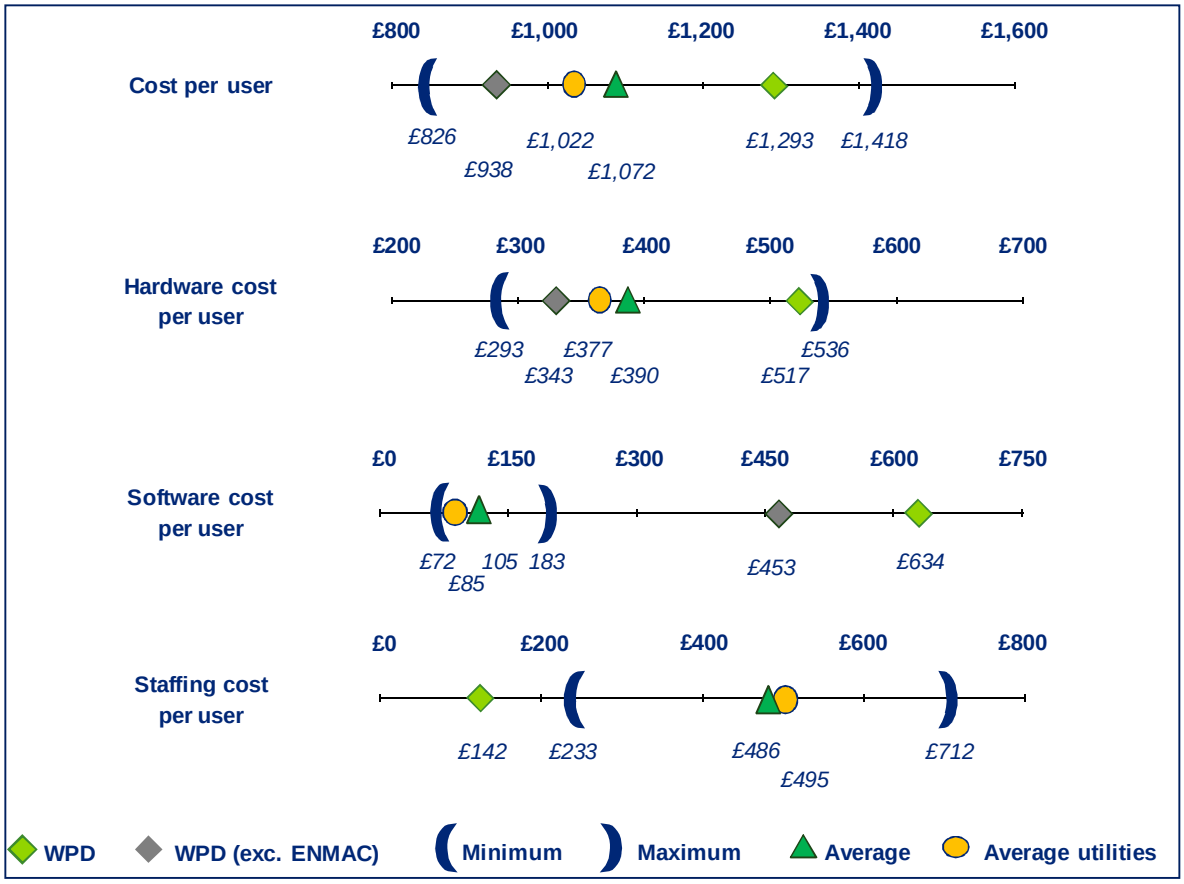
- WPD are among the top quartile but within the minimum and maximum range. Expensive handheld costs amounting to over £1,000,000 per annum (£1,250 per device) which is used for ENMAC. In our experience hardware cost per user tends to be around £500 where there are primarily traditional workstations (so called 'thick clients').

- WPD have a large software catalogue (about 500 for 5,823 users). A large software estate was adopted following the WPD recent acquisition and the consequent application rationalisation exercise has been recently completed. Also due to the nature of the

business, a WPD's software catalogue includes many operational related applications (such as electrical network analysis tools).

- WPD has a lower staffing cost per user than peers. This could be partially due to the lean IT team and no use of contractors or outsourcing. Also, following the acquisition of two DNOs, the operational user base increased significantly, but there was no similarly large increase in IT staff. Salaries for each type of staff within end user computing are within SMEs' expectations.

Figure 12: End User Computing Spend



Source: Deloitte analysis. Note that excluding ENMAC handheld devices (£1m) + SW (£1m) from the cost baseline results in reduction of circa 2m from EUC cost and benchmark results shift from the upper quartile to the lower quartile of peer benchmark range for total cost and HW costs metrics.

4.6 End User Computing – Key Statistic and Cost per Client

Our comparison of EUC Key Statistics to peers with similar number of users (see Figure 13) indicates the following:

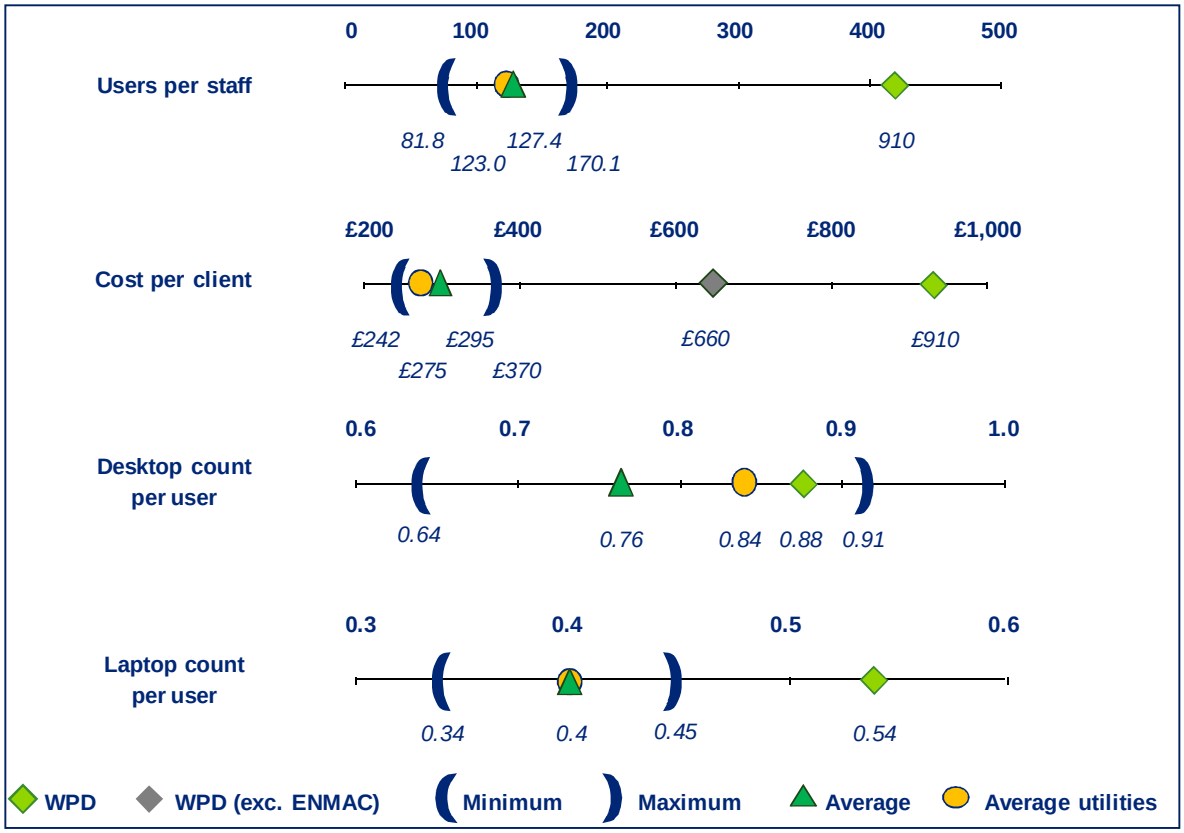
- Users per staff ratio is higher than peers and reflects high efficiency of EUC staff. This is probably due to the small IT team and the large user base (recently expanded following the acquisition).

- The cost per client (connected device that gets IT services) is high potentially due to expensive ENMAC handheld devices and untypically large software spend. The dispersed geographic business, with 5,823 users across 70 sites, can lead to further increased costs, pushing WPD towards the upper quartile of costs.

- The desktop count per user is high but within the expected range due to issuing a standard desktop per user in addition to shared workstations (comprising internet kiosks and ENMAC workstations).

- The laptop count per user is high. Operational staff have a mix of standard and operational laptops (sometimes both) and this leads to a higher laptop count per user than within peers.

Figure 13: End User Computing – Key Statistics and Cost per Client



Source: Deloitte analysis

4.7 Networks – Data Network

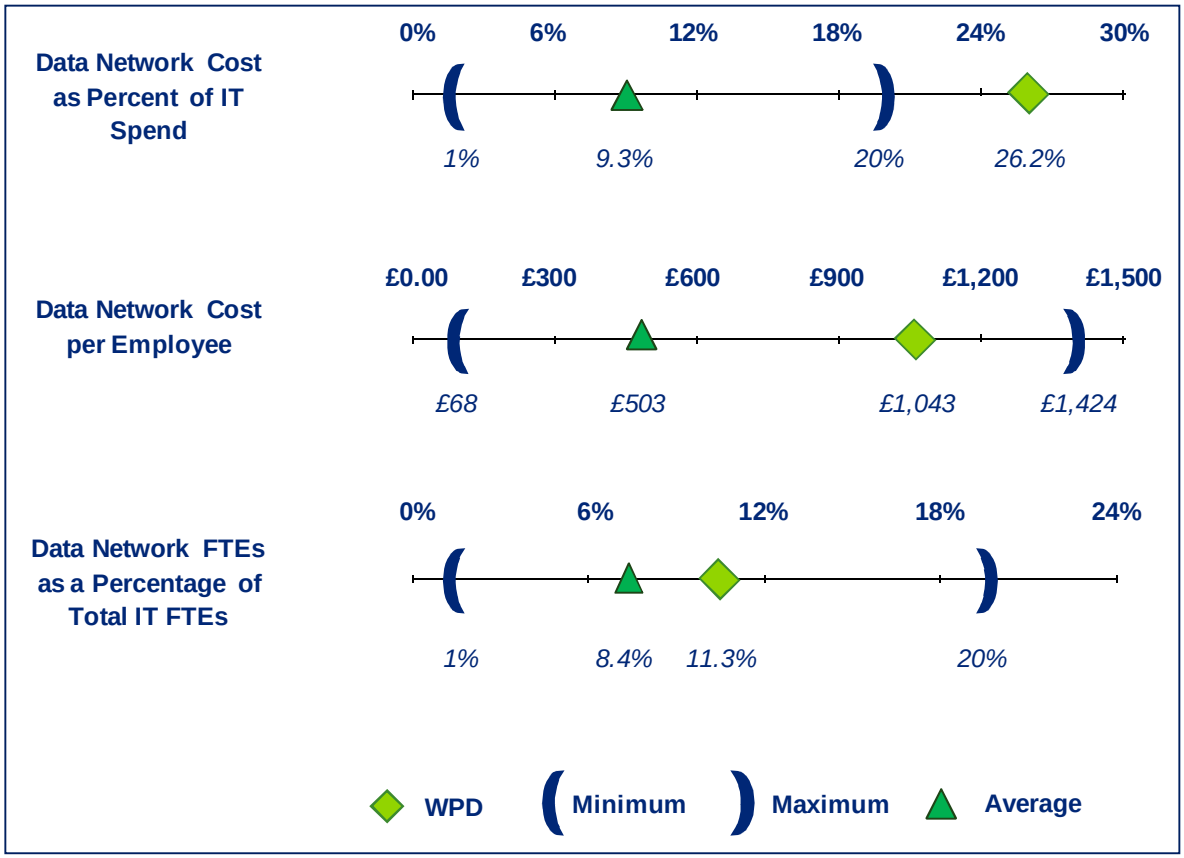
Our comparison of Data Network Cost to Utilities industry vertical peers (see Figure 14) indicates the following.

- WPD spends significantly more on data networks than its peers. This is probably due to WPD's resilience policies which requires high bandwidth capacities across the IT estate.

- The Data Network cost per employee is above average but within the minimum and maximum range.

- The ratio of Data Network FTEs as a percentage of total IT FTEs is above average but within the minimum and maximum range. This is probably due to the level of complexity and spread and WPD's network.

Figure 14: Networks –Data Network Cost



Source: Deloitte analysis

4.8 Networks - Mobile

Our comparison of Cost per End User Computing staff and users per server ratio to peers with similar number of users (see Figure 15) indicates the following.

- WPD's mobile charges for making calls to external networks using Vodafone are at par with median results for peak time and using O2 are below median.

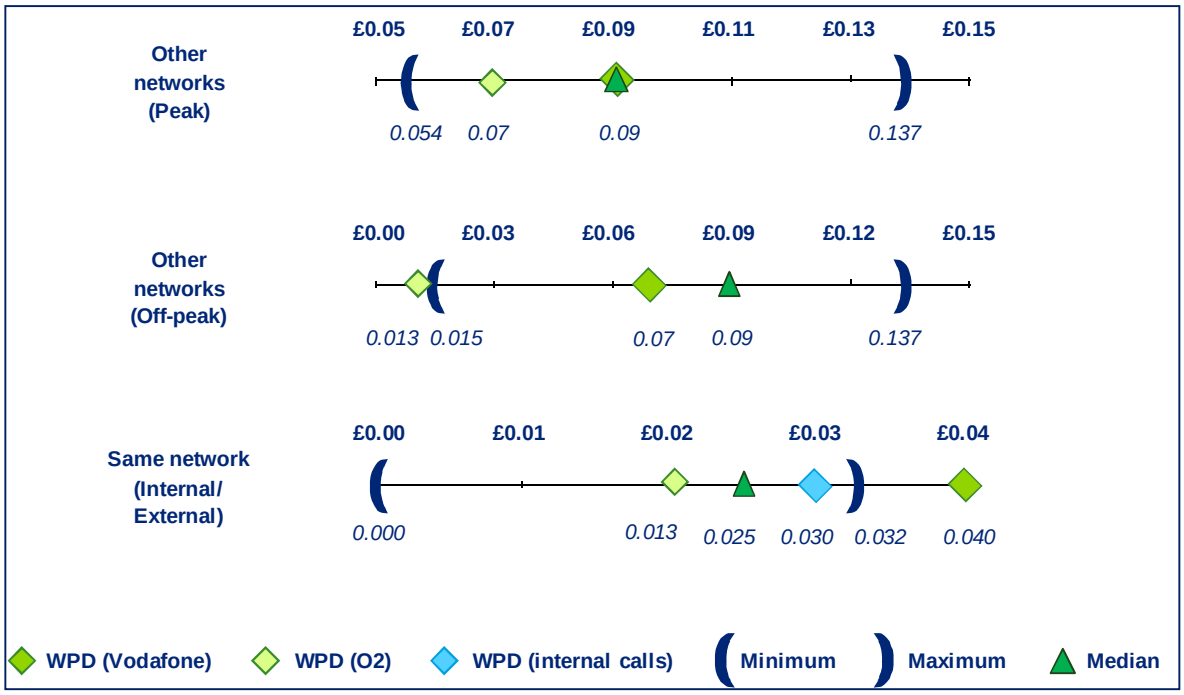
- WPD's mobile charges for making calls to external networks using Vodafone and O2 are below median for off-peak time.

- Call charges within the Vodafone network to WPD devices are within the benchmark range (in the upper quartile). Call charges within the Vodafone network to non-WPD devices are

higher than the benchmark range. The current Vodafone contract is 3 years old and is currently under review.

- O2 as a provider is cheaper than Vodafone on all KPIs.

Figure 15: Networks – Mobile Tariffs



Source: Deloitte analysis

4.9 Application Development and Application Maintenance – Staff Costs

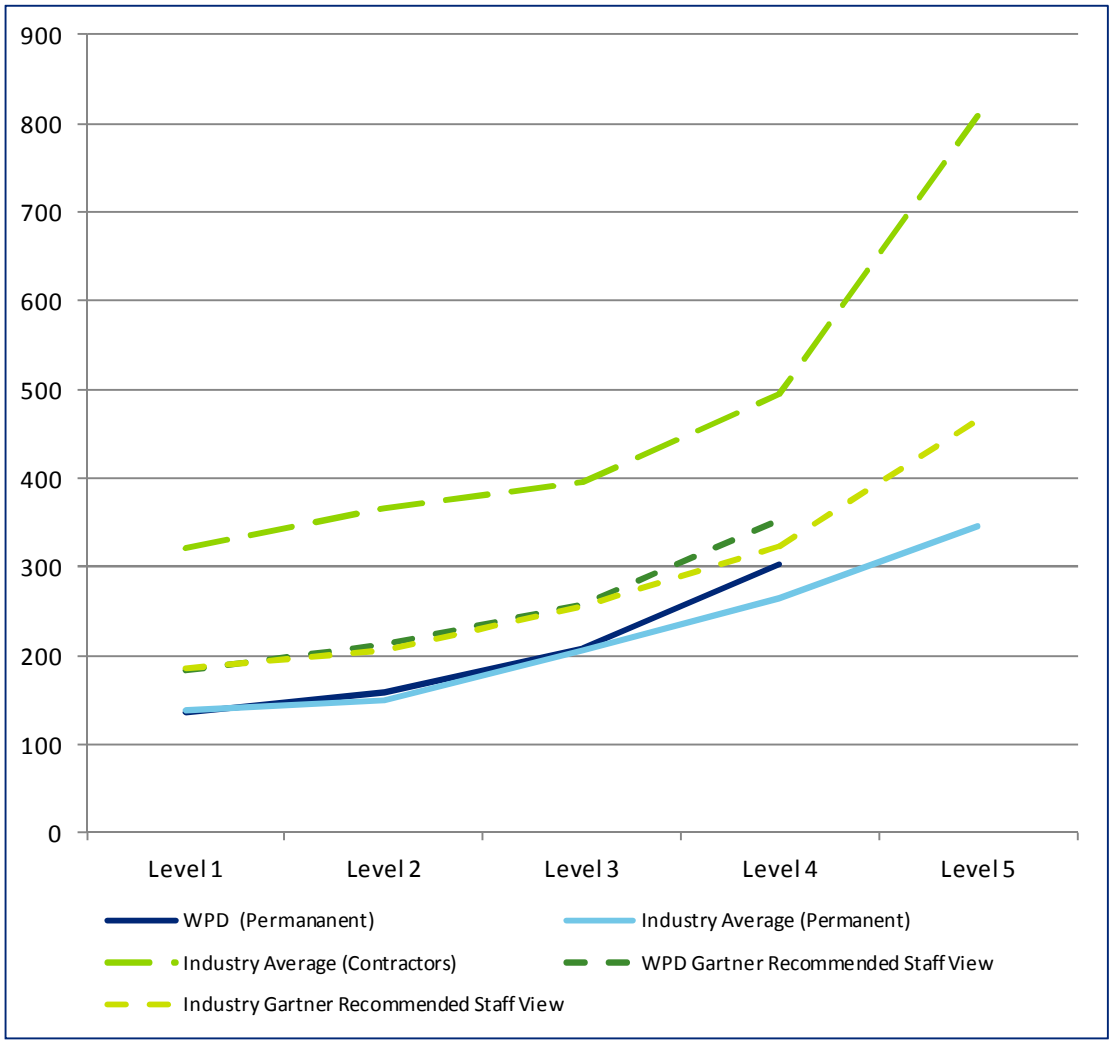
Comparison of Application Development and Application Maintenance ("**ADAM**") staff day rates against industry and regional day rates (see Figure 16) indicates the following:

- WPD's permanent staff daily rates (dark blue curve) are similar to average daily rates to permanent staff in the South West for the junior levels and fall within the range of SME expectations for the senior levels (light blue curve).

- When adjusting WPD's staff daily rates to include 23% of contractor costs based on Gartner's 'IT Staffing levels for 2011'report (dark green curve) daily rates increase significantly above the current daily rates of permanent staff.

- Also, WPD's staff profile is slightly more senior (level 3) than peers. This could be due to the fact that WPD have many in-house systems and hence development and maintenance of these are typically done by a more senior and experienced staff members.

Figure 16: Networks – ADAM day rates



Source: Deloitte analysis. As Function Points data was not available average salaries are benchmarked across five tiers of skills / seniority levels against average salaries for the same skills in the South West given that the majority of the Application Development and Application Maintenance staff is located in Plymouth.

4.10 Conclusions from bottom-up benchmarking

The following conclusions can be made from the bottom-up cost analysis and benchmarking:

- WPD has achieved post-merger cost efficiencies by rationalising and standardising its IT estate.
- WPD's IT organisation is relatively flat in terms of hierarchy and lean in terms of the number of IT functions. These features drive efficiency of IT staff cost alongside the fact that WPD are not using contractors as part of their IT workforce (IT Staff costs as percentage of total IT spend is 24.6% while 25th percentile in the industry is 24.8%).
- Although our results show cost reduction in key network tower KPIs between 2009/2010 and 2011/2012, WPD's network costs are significantly higher than its industry peers

(Network infrastructure costs are 36.9% of the IT budget compared to 7.1%). This could be driven by WPD's policies towards resilience and the need for further standardisation of network infrastructure.

- Although WPD's resilience policies should benefit the 'cost per physical server' ratios (denominators numbers are higher than in highly virtualised peers) these ratios are high compared to peers. Overall server hardware and software costs are relatively high compared to functional peers even after accounting for WPD's specific business nature. ENMAC deployment and the resilience agenda are directly linked to the higher hardware and software costs. Software costs are intrinsically linked to server numbers and their specification, in that the number of processor cores has a direct bearing on the quantity of licences required. For example, in Oracle deployments, a minimum of 25 user licences have to be purchased per processor core. For a dual socket/8 core server, 400 licences need to be purchased, regardless of the number of users. The same is true when buying processor licences whereby, in the previous example, 16 processor licences would be required.

5 Implications of the efficiency estimates

The bottom-up analysis uses the latest available data from WPD and various established benchmark datasets. This section describes what conclusions can be drawn about WPD's expected comparative efficiency performance in the future.

The top down analysis presented in Deloitte (2013a) found that the pre-merger WPD composed of two DNOs can be considered efficient relative to the other DNOs in 2009/10. However, the Central Networks DNOs acquired by WPD in April 2011 would need to reduce their costs by roughly 40% from their 2009/10 levels to reach the estimated top quartile efficiency level. This translates to about 30% reduction needed in costs for the post-merger WPD composed of the four DNOs to be considered efficient, using 2009/10 as a starting point.

Combining those top-down results with the insights from the bottom-up analysis suggests that the post-merger WPD should also be considered efficient:

- If there were no changes in costs following the merger, the unit costs for the combined group would be higher for the post-merger four DNO WPD compared to pre-merger two DNO WPD. However, the bottom-up analysis finds that the unit costs for the post-merger WPD are significantly *lower* in 2011/12 when compared to the unit costs of the pre-merger WPD in 2009/10 (when the top-down analysis finds WPD to be efficient). For example, IT spend per User went down from £6,622 to £4,328 (circa 35% decrease), Cost per End User Computing client went down from £1,174 to £910 (circa 23% decrease) and cost per connected network staff per device went down from £8,800 to £1,228 (circa 86% decrease as shown in Table 4).

- The company size increased by 158% in terms of the total network length as a result of the merger. However, the overall IT costs in 2011/12 for post-merger WPD are only 100% higher compared to the pre-merger WPD in 2009/10. The top-down estimation results provide a measure of economies of scale, indicating that when company size increases by 100%, costs are expected to increase by between 40% and 60%. The growth in the overall budget is therefore roughly in line with expected benefits from economies of scale.

- That is, the WPD IT & Telecom costs have increased for 2011/12 from their pre-merger 2009/10 level, when it was efficient compared to other DNOs, roughly in line with the expected economies of scale from the merger. The 2011/12 costs should therefore be expected to be efficient also. In other words, WPD's has already achieved the required cost reductions to bring the IT & Telecom costs of the old Central Networks DNOs down to the efficient level.

Appendix A Bottom-up benchmark sources

A.1.1.1 iTHC

Information Technology Healthcheck (iTHC) is a US-based IT cost benchmarking firm with a database of over 13,000 organisations in over 25 industries. iTHC allows focused and in depth IT functional benchmarking by providing precise comparison to similar peers (similar size, complexity and scale as WPD). iTHC focuses on delivering relevant data to firms interested in mapping and optimising their IT investments, to show the firms how they are doing in comparison to their peers and modelling future IT savings and benefits. iTHC were acquired by VMWare in April 2012.

Deloitte comprehensively uses iTHC to cost benchmark clients' IT function through the alliance with VMWare, where Deloitte have bought access to the iTHC database.

iTHC provides three levels of benchmarking: Benchmark Lite (BMLite), Quick Start (A20) and Comprehensive Benchmark (CBM). It was agreed that BMLite would be sufficient for this exercise, which provides over 160 KPIs split between Data Centre and Hosting, Networks, End User Computing, Help Desk and Applications.

BMLite provides an industry level efficiency view, giving a general understanding of the industry cost of service and overall performance. It is typically used as a high level overview, providing key IT area checks and an industry baseline view.

iTHC holds a database of over 13,000 peers which can then be filtered based on adjusting the dataset. This ensures that peers closely match WPD's specific footprint to offer a like-for-like comparison. This was achieved by inputting specific variables to reduce the size of the peer group. In addition to the complexity of the specific IT estate (Low, Medium, High), there are other specific inputs as detailed in Table A1.

Table A1: iTHC peer selection data points

IT Tower	IT Sub-Tower	Input variables
Data Centre and Hosting	Midrange	Server Count, Computing Scale (Small, Medium, Large), Computing Platform (Unix, Linux, Mac OS, Windows NT, Windows 2000+, OS400, Other)
	Mainframe	MIPS Count
Networks	Wide Area Data	Device Count
	Wireline	Annual Minutes
	Wireless	Device Count
	PBX	Extensions
End User Computing	Distributed Computing	User Count
Help Desk	Help Desk	Total Contact
Applications	Application Development	Function Points
	Application Support	Function Points

As iTHC data is US-focused, costs must be adjusted to GBP using Purchasing Power Parity, as previously described.

A.1.1.2 Computer Economics

Computer Economics is an IT research firm, founded in 1979, which focuses on the financial management of IT. Benchmarking data is collected from an annual survey of IT executives in the US and Canada, and published annually on IT spending and staffing metrics, IT salaries, IT security, malware and other similar topics.

Computer Economics offer higher level IT cost benchmarks than iTHC. This allows a holistic view of IT costs in relation to overall business revenue and costs. As Computer Economics data is US-focused, costs must be adjusted to GBP using Purchasing Power Parity, as previously described. Deloitte have bought access to Computer Economics' research and database and this is regularly used as part of IT assessment and cost benchmarking projects.

A.1.1.3 Gartner

Gartner is a US-based IT research and advisory firm, founded in 1979, that provide in-depth research and analysis into various areas of IT. Research provided by Gartner is offered as 'high-level' (e.g. assessing overall IT spend) and also at a lower level, on specific service towers. As Gartner data is US-focused, costs must be adjusted to GBP using Purchasing Power Parity, as

previously described. Similar to Computer Economics, this allows a holistic benchmark of the IT function, but also provides some detailed analysis into the IT service towers.

Deloitte have corporate accounts with Gartner which allows full access to Gartner's research, white papers and database. These are used regularly to supplement engagements with industry research and insights.

Appendix B Bottom-up definitions and data sources

Computer Economics	
Metrics	**Definition**
IT Operational Budget	IT operational budget includes all IT spending that is expensed in the current fiscal year, including depreciation
IT Capital Budget	IT capital budget includes all IT spending that is treated as capital expenditures in the current fiscal year. IT capital expenditures are typically charged to the IT operational budget as depreciation over several years
IT Outsourcing Spending	IT outsourcing expenditures are often part of the operational budget but can be part of the capital budget for investments such as application development. In this study, we assign outsourcing expenditures to various line item categories rather than treat them as a separate budget category
Total IT Spending	Total IT spending is the sum of the IT operational budget (excluding depreciation) and the IT capital budget. This statistic measures IT spending on a cash basis
Ratio of users to employees	This metric is calculated by dividing the number of users by the employee headcount in the organization. The higher this percentage, the more employees there are who use information systems, and the more IT-intensive the organization
PCs per user	This ratio is calculated by dividing the number of PCs by the number of users. When this ratio is less than 1.00, some users may be sharing workstations or using PCs not owned by the organization
Users with smartphones	Percentage of users with Smart phones. Smart phones include any of the growing number of devices that can give employees access to mobile applications via the Internet in addition to email, voice, and text communications.
Data Centres	Number of Data Centres
Total disk storage (TB)	The amount of storage the organisation had under management. This is measured in Terabytes.
Network sites	A network site is defined as a physical location such as an office building or warehouse that is connected to the organization's network and is supported by its IT organization. An organization that is housed in a single building or on a single campus has one network site. An organization with a headquarters building, three sales offices, and two distribution centres has six network sites. Network sites do not include individual users who connect to the organization's network through a VPN
Business applications	Business applications include any number of enterprise wide or departmental application systems, whether packaged software or custom-developed systems. Business applications do not include database management systems, data centre management software and utilities, or application development tools
IT Spending as a Percentage of Revenue	IT spending as a percentage of corporate revenue
Total IT Spending per User	Measures the IT Spending per user. Users are defined as individuals who have log-in accounts to the organization's systems. We do not count self-service Web customers as users, but we do count outside parties, such as partners and agents, who make use of the organization's systems and place demands on the IT organization for support
Total Spending per PC	Measures the IT Spending per PC. Users are defined as individuals who have log-in accounts to the organization's systems. We Measures the IT Spending per PC. The term "PC" includes all desktops, notebooks, and

	other workstations. It does not include smart phones or other handheld devices
Total IT Spending on Application Software per User	Total spending on business application software includes licensing and maintenance fees, implementation costs, and development costs. It does not include the cost of employing personnel to service and maintain business applications, but would include labour that has been capitalized as part of the development costs
Server & storage as Percent of Total IT Spend	Servers include all types of servers, from mainframes to low-end servers. Storage includes direct-attached storage, storage-area networks, network-attached storage, tape systems, and other storage peripherals
Data Centre OS and Mgmt SW as Percent of Total IT Spend	This category includes costs for server OS software and data centre management systems, such as job schedulers, performance monitors, and data centre utilities, except when such costs are bundled with the cost of hardware
PCs, Workstations, Terminals as Percent of Total IT Spend	This category includes expenses for personal computers and end-user workstations, including laptops, portables, and dumb terminals. It includes the desktop OS, personal desktop applications, and related maintenance costs
Printers, Scanners, Copiers as Percent of Total IT Spend	This category includes acquisition, leasing, and maintenance costs for all printers, copiers, scanners, and plotters. It does not include the cost of consumables, which are in the “other” or miscellaneous category. This category could also include hardware charges associated with managed print services, but not charges for personnel or consumables
Network Infrastructure as Percent of Total IT Spend	This category includes all expenses for network hardware and software
Carrier Services as Percent of Total IT Spend	This category includes telecom and datacom carrier charges, such as for frame-relay, ATM, ISDN, DSL, and leased lines, whether or not such charges are normally tracked as part of the IT budget. This line item does not include long-distance charges incurred by user departments. It does not include managed service expenses that replace the need for maintaining personnel or network infrastructure in-house
Application Software as Percent of Total IT Spend	This category includes software licence and maintenance fees, acquisition costs, and development costs for business applications. It also includes subscription costs for hosted applications and Software-as-a-Service
Business Continuity as Percent of Total IT Spend	This category includes the cost of off-site storage, secondary data centres, and backup facilities, disaster planning and testing, and related services
Security as Percent of Total IT Spend	This category includes acquisition and maintenance costs for security hardware, software, and services, such as security audits, assessments, testing, and managed security services
Personnel as Percent of Total IT Spend	This category includes all personnel-related costs, including direct compensation, taxes, and benefits, plus recruiting and training fees. It also includes the cost of temporary IT workers and IT contractors and the cost of outsourcing services that replace the need for IT staff
Utilities, Power, Cooling as Percent of Total IT Spend	This category includes all data centre utility costs, including power and cooling
IT Facilities/Floorspace as Percent of Total IT Spend	This category includes the cost of buildings, rent, property taxes and insurance, and corporate facilities charges
Other	This category includes miscellaneous expenses, consumables, travel and entertainment expenses, and expenses unique to the IT operational budget of a specific organization
IT Operational Budget as Percentage of Revenue	Benchmark for assessing spending levels.
IT Operational Budget per User	Benchmark for assessing spending levels is IT operational budget per user
IT Operational Budget per	Benchmark for assessing spending levels is IT operational budget per pc

PC	
Personnel as Percentage of the IT Operational Budget	Personnel expenses include all IT spending on employees and contractors and temps, as well as on recruiting and training. It also includes a portion of the money spent on outsourcing services that replace in-house operational staff
IT Capital Budget as Percentage of the IT Operational Budget	Benchmark for IT capital spending, examines the IT capital budget as a percentage of the IT operational budget
OS Instances per Physical Server	Server virtualization by the number of operating system instances per physical server
Users per Physical Server	The relationship between users and physical servers is a simple metric that provides insight into the extent of server proliferation in an organisation's data centre. Having a larger number of users per physical server generally promotes better asset utilization and greater productivity of administrative personnel.
Users per OS instance	Users per OS instance is a measure of an organization's IT intensity and asset utilization
Users per Printer	The ratio of users to printers is another look at how well the IT organization is utilizing IT assets. This ratio is calculated by dividing the number of users by the number of printers. Higher ratios reflect more sharing of printers and better hardware utilization. Lower numbers are indicative of situations where organizations have a higher-than-normal need for printers or have failed to consolidate such assets
Users per IT Staff Member	The ratio of users to IT staff members is the staffing metric equivalent to IT spending per user, and it varies from sector to sector because of the varying levels of IT intensity in each sector. Within the sector, it is indicative of the level of investment an organization is making in IT and the amount of support provided to users relative to its peers

Gartner	
Metrics	**Definition**
Data Network Cost as a Percent of IT Cost	Data network cost as a percent of total IT cost is helpful in understanding the relative level of IT costs to support the environment from a total IT portfolio perspective. Total IT Cost is defined as the fully burdened annual cost/expense for all IT non-personnel, personnel, and third party costs to support the enterprise. This includes the expense, lease, depreciation, maintenance, installation and taxes, as appropriate, for all non-personnel, personnel and third party IT investments
Data Network Cost Per Employee	Data network cost per employee is often used to determine the amount of IT support the average organization's workforce receives. Employees are the frequent users of technology this includes full time and part time employees.
Data Network FTEs as a Percentage of Total IT FTEs	Data network personnel includes in-house and contract full-time equivalents supporting the following IT functions: operations/maintenance, engineering technical services, planning and process management, services administration, management and administration. IT FTE represents the logical staff to support functions performed by the physical staff, measured in calendar time. This includes all staffing levels within the organization, from managers and project leaders to daily operations personnel. This also includes in sourced FTEs and contract FTEs

iTHC	
Metrics	**Definition**
Distributed Computing	This service area is focused on the direct support of the end user in the desktop environment. Included are all support and equipment related to desktop hardware and software, local area networks, shared resources, email, infrastructure servers, IS assets as well as the IS support staff for all facets of this area.
Midrange Computing	This service area is focused on the organization1s application servers (a.k.a. server farms or data centres). Included are all served applications, enterprise application systems, database management systems, SANs/NAS, Internet and test servers.
IT Help Desk	This service area is focused on the internal IT help desk or call centre. This can be a single point of contact or a virtual help desk consisting of a number of locations all taking user calls pertaining to IT assets, applications, networks or other services. Included are all of the equipment, agents and subject matter experts involved in handling end user calls.
Mainframe Computing	This service area is focused on "traditional" mainframe operations. Included are all system equipment, tapes, storage, printers and all support staff.
Applications Development	This service area is focused on internal efforts to develop new applications, interfaces, and database or web applications. All development tools, developers and administrative resources are included.
Applications Support	This service area is focused on the resources required to run, maintain and fix custom applications. All developer tools, developers and administrative resources are included
Telecommunications - PBX	This service area focuses on an organization's internal phone system. Included are the PBX(s), desk phones, extensions, voicemail and the resources to support the equipment and service.
Distributed Computing Metrics	
Cost per User	The total cost for all PC's, laptops, printers, peripherals, infrastructure servers, software, local area networking, facilities, staffing, sourcing per user. The metric is derived by adding up all costs and dividing by the number of end users supported by the IT organization.
Hardware Cost per User	The total cost for all hardware (PC's, laptops, printers, peripherals, infrastructure servers, software and local area networking) per user. The metric is derived by adding up all hardware costs and dividing by the number of end users supported by the IT organization.
Software Cost per User	The total cost for all software (desktop apps, groupware, email, IS apps, LAN tools and management tools) per user. This metric is derived by adding up all software costs and dividing by the number of end users supported by the IT organization.
Staffing Cost per User	The total cost for full time staff and contractors (management, technical support, admin, training, planning & process, LAN networking, infrastructure server admin and DBA's) per user. This metric is derived by adding up all staffing costs and dividing by the number of end users supported by the IT organization.
Transmission Cost per User	The total cost for LAN transmission costs over leased data circuits per user. This metric is derived by dividing the total transmission costs by the number of end users supported by the IT organization.
LAN Cost per User	The cost of all LAN hardware (routers, switches, hubs, CSU's/DSU's) and all LAN software per user. This metric is derived by adding all LAN costs

	and dividing by the number of end users supported by the IT organization.
Sourcing Cost per User	This metric is the cost for all outsourced staffing on a per user basis. The metric is derived by taking total cost for all outsourced staffing augmentation divided by the number of end users supported by the IT organization.
Facilities Cost per User	This metric is the cost for facilities (square footage, utilities, supplies) on a per user basis. The metric is derived by taking the total cost of facilities usage for hardware and staffing purposes divided by the number of end users supported by the IT organization.
Hardware Percent of Cost	The percent of all distributed computing costs associated with hardware.
Software Percent of Cost	The percent of all distributed computing costs associated with software.
Staffing Percent of Cost	The percent of all distributed computing costs associated with full time staff and contractors.
Transmission Percent of Cost	The percent of all distributed computing costs associated with LAN leased data circuits.
Facilities Percent of Cost	The percent of all distributed computing costs (hardware and staffing) associated with facilities.
Outsourcing Percent of Cost	The percent of all distributed computing costs associated with outsourced staffing augmentation.
Users per Staff	Staffing efficiency metric that is the number of end users supported by the IT organization divided by the total number of distributed computing staff. A high number here can indicate under-staffing while a low number can indicate over-staffing.
Cost per Client	The average cost for hardware and software per client computer (PC's and laptops).
Desktops per User	The average number of desktop PC's per supported end user.
Average Laptops per User	The average number of laptop computers per supported end user.
Cost per Staff	The average fully burdened salary per distributed computing support staff person.
Users per Server	The average number of end users per infrastructure server (file/print, email, communications, storage, intranet and IS support). A high number here can indicate too few servers while a low number can indicate too many servers.
Midrange Server Metrics	
Cost per Server	The total cost for all hardware (servers, storage), software (OS, DBMS, management, anti-virus, virtualization, utilities, business applications, ERP) disaster recovery, staffing, sourcing and facilities on a per server basis. This metric is derived by adding all costs and dividing by the total number of supported physical servers.
Software Cost per Server	The total software cost (OS, DBMS, management, anti-virus, virtualization, utilities, business applications, ERP) on a per server basis. This metric is derived by adding all software costs and dividing by the total number of supported physical servers.
Hardware Cost per Server	The total hardware cost (servers and storage) on a per server basis. This metric is derived by adding all hardware costs and dividing by the total number of supported physical servers.
Staffing Cost per Server	The total cost for full time staff and contractors (management, operations, technical support, DBA's, planning & process and admin) on a per server basis. This metric is derived by adding all staffing costs and dividing by the total number of supported physical servers.
Facilities Cost per Server	This metric is the cost for facilities (square footage, utilities, supplies) on a per server basis. The metric is derived by adding the total facilities cost for hardware and staff and dividing by the total number of supported physical servers.

Sourcing Cost per Server	The total cost for outsourced staff augmentation on a per server basis. This metric is derived by adding all outsourced staffing costs and dividing by the number of supported physical servers.
Disaster Recovery Cost per Server	The total cost for disaster recovery (hot sites, hardware and software) on a per server basis. This metric is derived by adding all DR costs and dividing by the number of supported physical servers.
Software Percent of Cost	The percent of all midrange costs associated with software.
Hardware Percent of Cost	The percent of all midrange costs associated with hardware.
Staffing Percent of Cost	The percent of all midrange costs associated with staffing (full time and contractor).
Facilities Percent of Cost	The percent of all midrange costs associated with facilities.
Outsourcing Percent of Cost	The percent of all midrange costs associated with outsourced staff augmentation.
Disaster Recovery Percent of Cost	The percent of all midrange costs associated with DR (hot sites, software and hardware).
Cost per Staff	The average fully burdened salary for midrange full time staff.
Servers per Staff	An efficiency metric that indicates the number of servers supported per midrange staff. A high number here can indicate under-staffing while a low number can indicate over-staffing.
Management Percent of Staff	The overall percentage of all staff (full time and contractor) that are management.
Disk Space per Server	The average disk space in gigabytes per server.
Mainframe Computing Metrics	
Cost per MIPS	The total cost for all hardware (mainframe systems, terminals, tape drive, silos, storage, peripherals), software (OS, DBMS, DR/Backup, virtualization, utilities, business applications, management), staffing, sourcing, facilities and disaster recovery on a per MIPs basis. This metric is derived by adding all costs and dividing by the total number of MIPS provided by the mainframe systems.
Software Cost per MIPS	The total cost for all software (OS, DBMS, DR/Backup, virtualization, utilities, business applications, management) on a per MIPs basis. This metric is derived by adding all software costs and dividing by the total number of MIPS provided by the mainframe systems.
Hardware Cost per MIPS	The total cost for all hardware (mainframe systems, terminals, tape drive, silos, storage, peripherals) on a per MIPs basis. This metric is derived by adding all hardware costs and dividing by the total number of MIPS provided by the mainframe systems.
Staffing Cost per MIPS	The total cost for full time staff and contractors (management, operations, technical support, DBA's, planning & process and admin) on a per MIPs basis. This metric is derived by adding all staffing costs and dividing by the total number of MIPS provided by the mainframe systems.
Facilities Cost per MIPS	This metric is the cost for facilities (square footage, utilities, supplies) on a per MIPS basis. This metric is derived by adding the total facilities cost for hardware and staff and dividing by the total number of MIPS provided by the mainframe systems.
Sourcing Cost per MIPS	The total cost for outsourced staff augmentation on a per MIPs basis. This metric is derived by adding all outsourced staffing costs and dividing by the total number of MIPS provided by the mainframe systems.
Disaster Recovery Cost per MIPS	The total cost for disaster recovery (hot sites, hardware and software) on a per MIPs basis. This metric is derived by adding all DR costs and dividing by the total number of MIPS provided by the mainframe systems.
Software Percent of Cost	The percent of all mainframe computing costs associated with software.
Hardware Percent of Cost	The percent of all mainframe computing costs associated with hardware.
Staffing Percent of Cost	The percent of all mainframe computing costs associated with full time staff

	and contractors.
Facilities Percent of Cost	The percent of all mainframe computing costs (hardware and staffing) associated with facilities.
Outsourcing Percent of Cost	The percent of all mainframe computing costs associated with outsourced staffing augmentation.
Disaster Recovery Percent of Cost	The percent of all mainframe computing costs associated with DR (hot sites, software and hardware).
Cost per Staff	The average fully burdened salary for mainframe computing full time staff.
MIPS per Staff	An efficiency metric that indicates the number of MIPS supported per mainframe computing staff. A high number here can indicate under-staffing while a low number can indicate over-staffing.
MIPS per Data Centre	The number of MIPS supported at each data centre running mainframe computer systems.
GB Disk Space per MIPS	The average number of gigabytes of disk storage for each MIP of processing provided by running mainframe computer systems.
Cost per Data Centre	The total cost for all in scope mainframe computing services divided by the number of distinct data centre locations running mainframe computer systems.
Staff per Data Centre	The total FTE count of full time and contractor staff divided by the number of distinct data centre locations running mainframe computer systems.
Help Desk Metrics	
Cost per Handled Contact	The total cost including telephony, hardware (PC workstations, agent equipment, VRU's), software (ticket tracking, management, expert systems, other apps), staffing, sourcing, network connectivity and facilities per handled contact. This metric is derived by adding all costs and dividing by the annual number of handled contacts.
Hardware Cost per Handled Contact	The total cost for all hardware (telephony, VRU's, PC workstations and agent equipment) per handled contact. This metric is derived by adding all hardware costs and dividing by the annual number of handled contacts.
Software Cost per Handled Contact	The total cost for all software (ticket tracking, management, expert systems and other apps) per handled contact. This metric is derived by adding all software costs and dividing by the annual number of handled contacts.
Staffing Cost per Handled Contact	The total cost for full time staff and contractors (management, supervisors, agents, contract agents, 2nd level SME's and support) per handled contact. This metric is derived by adding all staffing costs and dividing by the annual number of handled contacts.
Facilities Cost per Handled Contact	This metric is the cost for facilities (square footage, utilities, supplies) on a per handled contact basis. This metric is derived by adding all facilities costs and dividing by the annual number of handled contacts.
Transmission Cost per Handled Contact	The total cost for help desk data transmission costs over leased data circuits per handled contact. This metric is derived by adding all transmission costs and dividing by the annual number of handled contacts.
Sourcing Cost per Handled Contact	The total cost for all outsourced staffing augmentation per handled contact. The metric is derived by adding all outsourcing costs and dividing by the annual number of handled contacts.
Software Percent of Cost	The percent of all help desk costs associated with software.
Hardware Percent of Cost	The percent of all help desk costs associated with hardware.
Staffing Percent of Cost	The percent of all help desk costs associated with full time staff and contractors.
Outsourcing Percent of Cost	The percent of all help desk costs associated with outsourced staff augmentation.
Transmission Percent of Cost	The percent of all help desk costs associated with leased data circuit costs.
Facilities Percent of Cost	The percent of all help desk costs associated with facilities costs for help desk staff.

Queue Time Per Contact	The average time in seconds that a caller to the help desk has to wait before speaking to a live operator for assistance.
Staff Cost Per Contact	The average staffing cost (full time and contractor) per handled contact.
Cost Per Staff	The average fully burdened salary per help desk support staff person.
Annual Contacts Per Staff	An efficiency metric that quantifies the annual number of contacts handled per help desk staff. A high number here can indicate under-staffing while a low number can indicate over-staffing.
Tickets per Support Staff	An efficiency metric that quantifies the number of handled contacts for staff that deal directly with end users (supervisors, agents and 2nd line SME's).
Monthly Contacts per Agent	The number of monthly contacts per tier 1 agents answering calls from end users.
Percent of Calls Abandoned by Users	The percentage of calls where the end user hangs up prior to speaking to a live agent.
Agent Percent of Staff	The percentage of all help desk staff that are tier 1 agents that answer calls from end users.
First Contact Resolution Rate	The percentage of contacts that are resolved to the end users satisfaction on the first contact to the help desk.
Wide Area Data Metrics	
Cost per Connected Device	The total cost for all hardware (routers, switches, bridges, CSU/DSU's), transmission (leased lines, remote access, value added networks, frame relay, ATM, satellite space, dial backup), software (networking, management, tools), staffing, sourcing and facilities on a per connected device basis. This metric is derived by adding all costs and dividing by the total number of connected devices on the wide area network.
Software Cost per Device	The total cost of all software (networking, management, tools) on a per connected device basis. This metric is derived by adding all software costs and dividing by the total number of connected devices on the wide area network.
Hardware Cost per Device	The total cost of all hardware (routers, switches, bridges, CSU/DSU's) on a per connected device basis. This metric is derived by adding all hardware costs and dividing by the total number of connected devices on the wide area network.
Staffing Cost per Device	The total cost for full time staff and contractors (management, operations, technical support, planning & process, security and admin) on a per connected device basis. This metric is derived by adding all staffing costs and dividing by the total number of connected devices on the wide area network.
Transmission Cost per Device	The total cost for all transmission expenses (leased lines, remote access, value added networks, frame relay, ATM, satellite space, dial backup) on a per connected device basis. This metric is derived by adding all transmission costs and dividing by the total number of connected devices on the wide area network.
Facilities Cost per Device	This metric is the cost for facilities (square footage, utilities, supplies) on a per connected device basis. The metric is derived by adding the total cost facilities cost for hardware and staff divided by the total number of connected devices on the wide area network.
Sourcing Cost per Device	The total cost for outsourced staff augmentation on a per connected device basis. This metric is derived by adding all outsourced sourcing costs and dividing by the total number of connected devices on the wide area network.
Software Percent of Cost	The percent of all wide area data costs associated with software.
Hardware Percent of Cost	The percent of all wide area data costs associated with hardware.
Staffing Percent of Cost	The percent of all wide area data costs associated with full time staff and contractors.

Transmission Percent of Cost	The percent of all wide area data costs associated with WAN leased data circuits.
Facilities Percent of Cost	The percent of all wide area data costs (hardware and staffing) associated with facilities.
Outsourcing Percent of Cost	The percent of all wide area data costs associated with outsourced staffing augmentation.
Cost per GB of Traffic	The total cost for all in scope wide area network costs divided by the total giga-bytes of network traffic.
Connected Devices per Site	The total number of connected devices on the wide area data network divided by the total number of distinct sites connected to the wide area data network.
Cost per Staff	The average fully burdened salary for wide area data full time staff.
Annual Traffic per Port	The total annual network traffic divided by the total number of connected devices on the wide area network.
Staff Count per Connected Device	The total FTE count of full time and contractor staff divided by the total number of connected devices on the wide area network.
Total Annual Internet Traffic per Connected Device	The total annual amount of Internet only traffic divided by the total number of connected devices on the wide area network.
Telecom - Wireline Metrics	
Cost per Minute	The total cost for all hardware (equipment, tools), software (management, tools, utilities), transmission (access charges, usage charges, long distance) staffing, sourcing and facilities on a cost per minute basis. This metric is derived by adding all costs and dividing by the total number of voice minutes consumed by end users on an annual basis.
Software Cost per Minute	The total cost for all software (management, tools, utilities) on a cost per minute basis. This metric is derived by adding all software costs and dividing by the total number of voice minutes consumed by end users on an annual basis.
Hardware Cost per Minute	The total cost for all hardware (equipment, tools) on a cost per minute basis. This metric is derived by adding all hardware costs and dividing by the total number of voice minutes consumed by end users on an annual basis.
Staffing Cost per Minute	The total cost for full time staff and contractors (management, operations, technical support, planning & process and admin) on a cost per minute basis. This metric is derived by adding all staff costs and dividing by the total number of voice minutes consumed by end users on an annual basis.
Transmission Cost per Minute	The total cost for transmission (access charges, usage charges, long distance) on a cost per minute basis. This metric is derived by adding all transmission costs and dividing by the total number of voice minutes consumed by end users on an annual basis.
Sourcing Cost per Minute	The total cost for outsourced staff augmentation on a cost per minute basis. This metric is derived by adding all outsourced staffing costs and dividing by the total number of voice minutes consumed by end users on an annual basis.
Facilities Cost per Minute	This metric is the cost for facilities (square footage, utilities, supplies) on a per minute basis. This metric is derived by adding the total facilities cost for hardware and staff and dividing by the total number of voice minutes consumed by end users on an annual basis..
Software Percent of Cost	The percent of all wireline costs associated with software.
Hardware Percent of Cost	The percent of all wireline costs associated with hardware.
Staffing Percent of Cost	The percent of all wireline costs associated with full time staff and contractors.
Transmission Percent of Cost	The percent of all wireline costs associated with local switched network connectivity.

Facilities Percent of Cost	The percent of all wireline costs associated with facilities.
Outsourcing Percent of Cost	The percent of all wide area data costs associated with outsourced staffing augmentation.
Annual Minutes per User	The total number of annual consumed voice minutes divided by the total number of end users that use wireline services.
Cost per Staff	The average fully burdened salary for wireline full time staff.
Annual Minutes per Staff	An efficiency metric that indicates the number of annual minutes supported per wireline staff. A high number here can indicate under-staffing while a low number can indicate over-staffing.
Local Peak Minutes per User	The total annual number of consumed local peak minutes divided by the total number of end users that use wireline services.
International Minutes per User	The total annual number of consumed international minutes divided by the total number of end users that use wireline services.
Telecom – Wireless Metrics	
Cost per Wireless Device	The total cost for all hardware (cell phones, multi-function devices, pagers), software (management, downloads, tools, utilities), transmission (access charges, usage charges, option charges), staffing, sourcing and facilities on a per wireless device basis. This metric is derived by adding the total costs and dividing by the total number of in-scope wireless devices.
Software Cost per Wireless Device	The total cost for software (management, downloads, tools, utilities) on a per wireless device basis. This metric is derived by adding the total software costs and dividing by the total number of in-scope wireless devices.
Hardware Cost per Wireless Device	The total cost for all hardware (cell phones, multi-function devices, pagers) on a per wireless device basis. This metric is derived by adding the total hardware costs and dividing by the total number of in-scope wireless devices.
Staffing Cost per Wireless Device	The total cost for full time staff and contractors (management, operations, technical support, planning & process and admin) on a per wireless device basis. This metric is derived by adding all staffing costs and dividing by the total number of in-scope wireless devices.
Transmission Cost per Wireless Device	The total cost for transmission (access charges, usage charges, option charges) on a per wireless device basis. This metric is derived by adding all transmission costs and dividing by the total number of in-scope wireless devices.
Sourcing Cost per Wireless Device	The total cost for outsourced staff augmentation on a per wireless device basis. This metric is derived by adding all outsourced staffing costs and dividing by the total number of in-scope wireless devices.
Facilities Cost per Wireless Device	This metric is the cost for facilities (square footage, utilities, supplies) on a per wireless device basis. The metric is derived by adding the facilities cost for hardware and staff divided by the total number of in-scope wireless devices.
Software Percent of Cost	The percent of all wireless costs associated with software.
Hardware Percent of Cost	The percent of all wireless costs associated with hardware.
Staffing Percent of Cost	The percent of all wireless costs associated with full time staff and contractors.
Transmission Percent of Cost	The percent of all wireless costs associated with voice/data/messaging usage by in scope wireless devices.
Facilities Percent of Cost	The percent of all wireless costs associated with facilities.
Outsourcing Percent of Cost	The percent of all wireless costs associated with outsourced staffing augmentation.
Cost per Minute	The total transmission cost divided by the annual number of minutes consumed by in scope wireless devices.

Cost per Staff	The average fully burdened salary for wireless support staff.
Cellular Text Messages per Wireless Device	The total number of text messages sent divided by the total number of in-scope wireless devices.
Wireless Devices per Staff	An efficiency metric that indicates the number of wireless devices supported per wireless staff. A high number here can indicate under-staffing while a low number can indicate over-staffing.
Minutes per Wireless Device	The total number of minutes consumed by all wireless devices divided by the total number of in-scope wireless devices.
Base Plan Cost per User	The total base plan costs divided by the number of wireless device end users.
Telecom – PBX Metrics	
Cost per Extension	The total cost for all hardware (PBX, VoIP, handsets), software (management, tools, utilities), transmission (access charges, usage charges), staffing, sourcing, facilities on a per supported extension basis. This metric is derived by adding the total costs and dividing by the total number of supported extensions.
Software Cost per Extension	The total cost for software (management, tools, utilities) on a per supported extension basis. This metric is derived by adding the total software costs and dividing by the total number of supported extensions.
Hardware Cost per Extension	The total cost for hardware (PBX, VoIP, handsets) on a per supported extension basis. This metric is derived by adding up the total hardware costs and dividing by the total number of supported extensions.
Staffing Cost per Extension	The total cost for full time staff and contractors (management, operations, technical support, planning & process and admin) on a per supported extension basis. This metric is derived by adding the total staffing costs and dividing by the total number of supported extensions.
Transmission Cost per Extension	The total cost for transmission (access charges, usage charges) on a per supported extension basis. This metric is derived by adding all transmission costs and dividing by the total number of supported extensions.
Sourcing Cost per Extension	The total cost for outsourced staff augmentation on a per supported extension basis. This metric is derived by adding all outsourced staffing costs and dividing by the total number of supported extensions.
Facilities Cost per Extension	This metric is the cost for facilities (square footage, utilities, supplies) on a per extension basis. This metric is derived by adding the facilities cost for hardware and staff and dividing by the total number of supported extensions.
Software Percent of Cost	The percent of all PBX costs associated with software.
Hardware Percent of Cost	The percent of all PBX costs associated with hardware.
Staffing Percent of Cost	The percent of all PBX costs associated with full time staff and contractors.
Transmission Percent of Cost	The percent of all PBX costs associated with leased voice communications circuits.
Facilities Percent of Cost	The percent of all PBX costs (hardware and staffing) associated with facilities.
Outsourcing Percent of Cost	The percent of all PBX costs associated with outsourced staffing augmentation.
Extensions per Staff	An efficiency metric that indicates the number of extensions supported per PBX staff. A high number here can indicate under-staffing while a low number can indicate over-staffing.
Cost per Staff	The average fully burdened salary for PBX support staff.
Extensions per Site	The total number of supported extensions divided by the number of distinct supported sites hosting PBX equipment.
MACs per Extension	The total number of annual moves, adds, or changes divided by total number of supported extensions.

Applications Support Metrics	
Cost per Function Point Supported	The total cost for all hardware (workstations, servers, storage), software (compilers, development suites, vendor packages, utilities, management, other tools), staffing, sourcing and facilities on a per supported function point basis. This metric is derived by adding the total costs and dividing by the total number of function points in the supported applications portfolio.
Software Cost per Function Point	The total cost for all software (compilers, development suites, vendor packages, utilities, management, other tools) on a per supported function point basis. This metric is derived by adding the total software costs and dividing by the total number of function points in the supported applications portfolio.
Hardware Cost per Function Point	The total cost for all hardware (workstations, servers, storage) on a per supported function point basis. This metric is derived by adding up the total hardware costs and dividing by the total number of function points in the supported applications portfolio.
Staffing Cost per Function Point	The total cost for full time staff and contractors (management, programmers, DB developers, QA testing, planning & process, admin and support) on a per supported function point basis. This metric is derived by adding the total staffing costs and dividing by the total number of function points in the supported applications portfolio.
Sourcing Cost per Function Point	The total cost for outsourced staff augmentation on a per supported function point basis. This metric is derived by adding all outsourced staffing costs and dividing by the total number of function points in the supported applications portfolio.
Facilities Cost per Function Point	This metric is the cost for facilities (square footage, utilities, supplies) on a per supported function point basis. This metric is derived by adding the facilities cost for hardware and staff and dividing by the total number of function points in the supported applications portfolio.
Hardware Percent of Cost	The percent of all applications support costs associated with hardware.
Software Percent of Cost	The percent of all applications support costs associated with software.
Staffing Percent of Cost	The percent of all applications support costs associated with full time staff and contractors.
Facilities Percent of Cost	The percent of all applications support costs (hardware and staffing) associated with facilities.
Outsourcing Percent of Cost	The percent of all applications support costs associated with outsourced staffing augmentation.
Workstation Cost per Function Point	The total cost for all workstations divided by the total number of function points in the supported applications portfolio.
Function Points per Staff	An efficiency metric that indicates the number of function points supported per applications support staff. A high number here can indicate under-staffing while a low number can indicate over-staffing.
Average Storage Cost per Function Point	The total cost for all storage divided by the total number of function points in the supported applications portfolio.
Server Cost per Function Point	The total cost for all servers divided by the total number of function points in the supported applications portfolio.
Cost per Staff	The average fully burdened salary for application support staff.
Function Points Supported per Staff	The average number of function points supported per application support staff.
Applications Development Metrics	
Cost per Function Point Developed	The total cost for all hardware (workstations, servers, storage), software (compilers, development suites, vendor packages, utilities, management, other tools), staffing, sourcing and facilities on a per developed function point basis. This metric is derived by adding the total costs and dividing by the total number of function points in the applications development portfolio.

Software Cost per Function Point	The total cost for all software (compilers, development suites, vendor packages, utilities, management, other tools) on a per developed function point basis. This metric is derived by adding the total software costs and dividing by the total number of function points in the applications development portfolio.
Hardware Cost per Function Point	The total cost for all hardware (workstations, servers, storage) on a per developed function point basis. This metric is derived by adding up the total hardware costs and dividing by the total number of function points in the applications development portfolio.
Staffing Cost per Function Point	The total cost for full time staff and contractors (management, programmers, DB developers, QA testing, planning & process, admin and support) on a per developed function point basis. This metric is derived by adding the total staffing costs and dividing by the total number of function points in the applications development portfolio.
Sourcing Cost per Function Point	The total cost for outsourced staff augmentation on a per developed function point basis. This metric is derived by adding all outsourced staffing costs and dividing by the total number of function points in the applications development portfolio.
Facilities Cost per Function Point	This metric is the cost for facilities (square footage, utilities, supplies) on a per developed function point basis. This metric is derived by adding the facilities cost for hardware and staff and dividing by the total number of function points in the applications development portfolio.
Hardware Percent of Cost	The percent of all applications development costs associated with hardware.
Software Percent of Cost	The percent of all applications development costs associated with software.
Staffing Percent of Cost	The percent of all applications development costs associated with full time staff and contractors.
Facilities Percent of Cost	The percent of all applications development costs (hardware and staffing) associated with facilities.
Outsourcing Percent of Cost	The percent of all applications development costs associated with outsourced staffing augmentation.
Workstation Cost per Function Point	The total cost for all workstations divided by the total number of function points in the applications development portfolio.
Function Points per Staff	An efficiency metric that indicates the number of function points developed per applications development staff. A high number here can indicate under-staffing while a low number can indicate over-staffing.
Storage Cost per Function Point	The total cost for all storage divided by the total number of function points in the applications development portfolio.
Server Cost per Function Point	The total cost for all servers divided by the total number of function points in the applications development portfolio.
Cost per Staff	The average fully burdened salary for application support staff.
Function Points Supported per Staff	The average number of function points supported per application support staff.

5.1.1 Data sources

Information Technology Healthcheck (iTHC)	http://www.ithcsolutions.com/ithc/
Computer Economics	http://www.computereconomics.com/ • "IT Spending and Staffing Benchmarks, 2011/2012, Chapter 12, Energy and Utilities Sector Benchmarks"

Gartner	http://www.gartner.com • "IT Key Metrics Data 2012: Key Industry Measures: Utilities Analysis: Current Year" • "IT Key Metrics Data 2012: Key Infrastructure Measures: Unix Server Analysis: Current Year" • "IT Key Metrics Data 2012: Key Infrastructure Measures: Windows Server Analysis: Current Year" • "IT Key Metrics Data 2012: Key Infrastructure Measures: Mainframe Analysis: Current Year" • "IT Key Metrics Data 2012: Key Infrastructure Measures: Storage Analysis: Current Year" • "IT Key Metrics Data 2012: Key Infrastructure Measures: Data Network Analysis: Current Year" • "IT Key Metrics Data 2012: Key Infrastructure Measures: Local-Area Data Analysis: Current Year" • "IT Key Metrics Data 2012: Key Infrastructure Measures: Wide-Area Data Analysis: Current Year" • "IT Key Metrics Data 2012: Key Infrastructure Measures: Voice Network Analysis: Current Year" • "IT Key Metrics Data 2012: Key Infrastructure Measures: Voice Premise Technology Analysis: Current Year" • "IT Key Metrics Data 2012: Key Infrastructure Measures: Wide-Area Voice Network Analysis: Current Year" • "IT Key Metrics Data 2012: Key Infrastructure Measures: End-User Computing Analysis: Current Year" • "IT Key Metrics Data 2012: Key Infrastructure Measures: IT Service Desk Analysis: Current Year"
ITJobsWatch	http://www.itjobswatch.co.uk
Purchasing Power Parity (0.678)	http://stats.oecd.org/Index.aspx?DataSetCode=PPPGDP

