# Quality Improvement Trends in the Telecommunications Industry

Then and Now: On-Time Delivery Measurement Study 2009 vs. 2013

This paper is number eight in a series* to illustrate industry performance based on TL 9000 Performance Data Reports (PDRs). This paper shows how On-Time Delivery impacts quality. It presents the On-Time Delivery measurements results from September 2011-August 2013 as compared to an initial study first published for the period, February 2007-January 2009. Readers will gain an understanding of how the state of telecom quality, in the same product categories, compares between the two studies.

The QuEST Forum TL 9000 repository is unique in that it contains the only benchmark data available anywhere that is systematically audited by a third party to a stringent industry standard definition. This database enables QuEST Forum to identify industry performance trends, both positive and negative, allowing stakeholders to take appropriate action and better manage their supply chain.

In this study the overall performance in 2011 for On-Time Delivery had degraded from results in 2009. The material below examines the potential reasons for this change.

* Previous paper topics included: On-Time Delivery, Switching Problem Report and Fix Response Time, Edge Routers, Wireless Return Rates, Simple and Complex (aka Smart phones) Wireless Devices, Repair Service Quality and Network Operator Quality Improvement.

## Measured Product Categories for On-Time Delivery

Eight product categories were selected, see Table 1 and measured by the following three On-Time Delivery measurements:

- On-Time Item Delivery (OTI)
- On-Time Service Delivery (OTS)
- On-Time Item Delivery to Supplier Promise Date (OTIP).

These measurements are used to evaluate organizations on their on-time delivery performance as they strive to meet expectations on orders of any kind from the customer.

In order to show as complete a picture as possible regarding the state of quality relevant to the On-Time Delivery measurements, the study also includes the recent results for the newly required measurement On-Time Item Delivery to Supplier Promise Date (OTIP) and a break out of the On-Time Service (OTS) delivery measurement results from the On-Time Item (OTI) measurement results.

| Product Category | Product Category Name | Applicable On-Time Delivery Measurement |
|---|---|---|
| 1.2.2 | Access Multi-Service | OTI and OTIP |
| 1.2.9.2 | Edge Routers | OTI and OTIP |
| 3.3.2 | Base Transceiver System (BTS) | OTI and OTIP |
| 4.2.1 | On-line Critical Operations Support Systems | OTI and OTIP |
| 5.3 | Power Systems | OTI and OTIP |
| 7.1.1 | Installation | OTS |
| 7.2.2 | Software Development Service | OTS |
| 8.5.2.3 | Optical Subassemblies | OTI and OTIP |

**Table 1** - On-Time Delivery Measurement Applicability Table by Product Category

## Initial Study vs. Current Study

### OTI Industry Average Comparison

- **OTI to CRD (Customer Request Date) Initial Study Results Findings**: Delivery variability across the six product categories was reduced significantly over the two year time period. As shown in Figure 2, the range

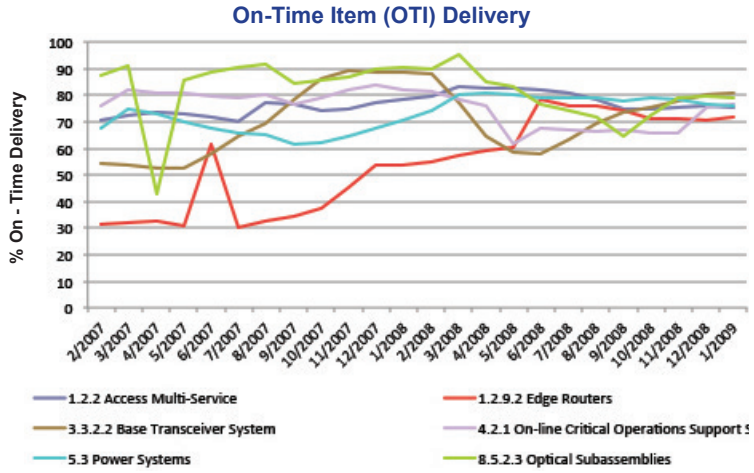


**Figure 2** - Initial Study: On-Time Item Delivery (OTI) Industry Average

of results was between 31% to 98% from 2007 to the end of 2008 and then the range narrowed to 72% - 99%. At the same time, the standard deviation was also reduced by more than half from 22% to 10%.

- **OTI to CRD Current Study Results Findings**: Delivery variability across the six product categories was not reduced over the two year time period significantly as in the initial period. As shown in Figure 3, the range of results is consistently 34% to 92% for the full time period of study between 2011 to Aug 2013. At the same time, the standard deviation increased from 11% to 16%.
- **Comparison Conclusion:** The OTI to CRD results for the recent period of study 2011 - 2013 show that there is no longer a dramatic improvement trend but rather results for all products have hit a plateau within the 34% - 92% range.

### OTI Linear Trend Comparison

- **OTI to CRD Initial Study:** There was an overall improvement trend across most product categories. Five of the six product categories ended the period with higher On-Time Delivery (see Table 4). The linear trend increased from a range of ~ 31% to 87% in early 2007 to narrowed range of ~ 71% to 80% in late 2008 (see Figure 4). As shown in Table 4, categories including edge routers, BTS, and power showed dramatic relative percent increases, 130%, 50%, and 13% respectively. This was welcome news as these were key elements in providing high speed mobile data access, a major growth area in the industry at the time. The initial poor performance in these categories ranging from 31% to 70% provided ripe opportunity for improvement. Even the categories that decreased, such as Optical Subassemblies and Installation Service, demonstrated reasonable to strong performance at the end of the period.
- **OTI to CRD Current Study:** There was an overall improvement trend across most product categories however the ranges were very low to begin with and much lower as compared to the initial study results. Five of the six product

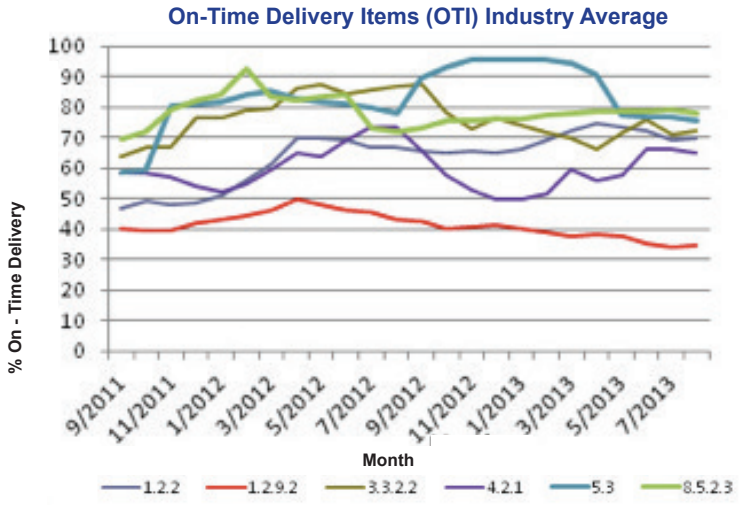


**Figure 3** - Current Study: On-Time Item Delivery (OTI) Industry Average

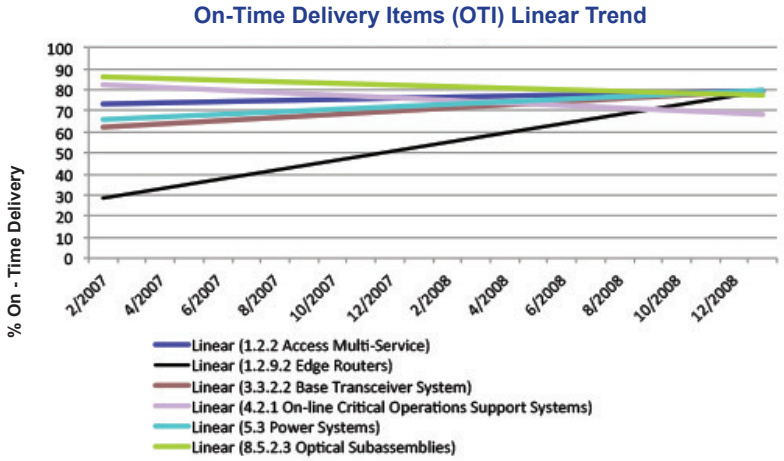


**Figure 4** - Initial Study: On-Time Item Delivery (OTI) Linear Trend

| Product Category | | 2007-2008 Initial OTI | 2007-2008 Final OTI | Percent Improvement |
|---|---|---|---|---|
| 1.2.2 | Access Multi-Service | 70.5 | 75.5 | 7.1% |
| 1.2.9.2 | Edge Routers | 31.2 | 71.8 | 130.5% |
| 3.3.2 | Base Transceiver System (BTS) | 54.1 | 80.9 | 49.7% |
| 4.2.1 | On-line Critical Operations Support Systems | 75.7 | 76.7 | 1.3% |
| 5.3 | Power Systems | 67.3 | 76.1 | 13.1% |
| 8.5.2.3 | Optical Subassemblies | 70.5 | 75.5 | -10.0% |

**Table 4** - On-Time Item Delivery (OTI) Improvement Trend from initial study

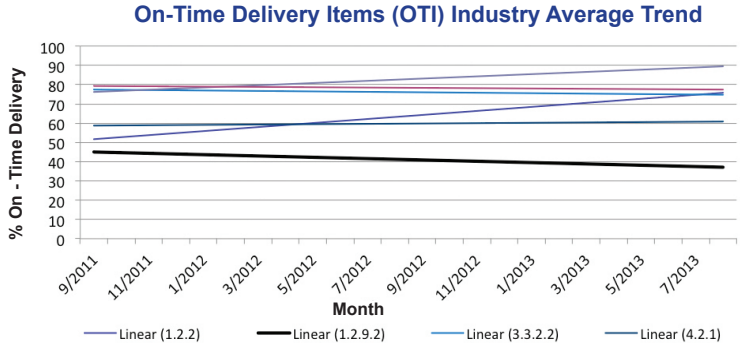


**Figure 5** - Current Study: On-Time Item Delivery (OTI) Linear Trend

categories ended the period with higher on-time delivery (see Table 5). The linear trend range improved from a range of ~ 39% to 69% in early 2011 to range of ~ 36% to 79% in late 2013 (see Figure 5).

- **Comparison Conclusion:** Comparison of the two study periods show that the 2011 - 2013 period has a lower beginning and ending range as compared to the original 2007 - 2008 period. Although the 2011 - 2013 period has 5 of 6 product categories with improvement, unfortunately the starting and ending range of percentages are much lower as compared to the original study period suggesting that quality related to OTI is not improving and suffered a major setback between 2008 and 2011.

### OTS Industry Average

- **OTS Initial Study:** There were two product categories with On-Time Delivery of Service (OTS) within the initial study time period. Table 6 (Figure 6) shows Installation with an almost 6% decline. And the other Software Development Services shows an 8% improvement.
- **OTS Current Study:** Results for the same two products with On-Time Delivery of Service (OTS) were reviewed for the current study. Both categories show an improvement trend concluding that the quality of service delivery is improving. – see Table 7 (Figure 7).
- **Comparison Conclusion:** For product category 7.1.1 2012 data suggest a post recession recovery. For product category 7.2.2 software development services held the gains created in 2007 and showed continued improvements during the last two years (2012 and 2013).

| Product Category | | 2011-2013 Initial OTI | 2011-2013 Final OTI | Percent Improvement |
|---|---|---|---|---|
| 1.2.2 | Access Multi-Service | 35.1 | 48.9 | 39.4% |
| 1.2.9.2 | Edge Routers | 26.6 | 14.2 | -46.4% |
| 3.3.2 | Base Transceiver System (BTS) | 24.1 | 61.4 | 154.4% |
| 4.2.1 | On-line Critical Operations Support Systems | 10.0 | 32.6 | 226.9% |
| 5.3 | Power Systems | 23.1 | 25.3 | 9.7% |
| 8.5.2.3 | Optical Subassemblies | 41.1 | 46.9 | 14.0% |

**Table 5** - On-Time Item Delivery (OTI) Improvement Trend from current study

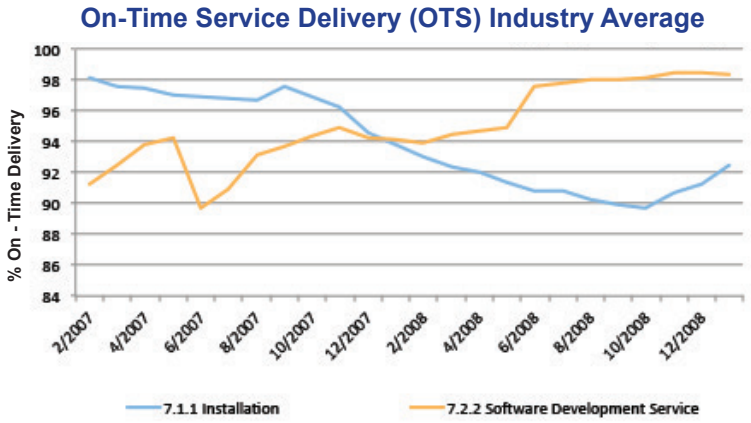


**Figure 6** - Initial Study: On-Time Service Delivery (OTS) Industry Average

| Product Category | | 2007-2008 Initial OTI | 2007-2008 Final OTI | Percent Improvement |
|---|---|---|---|---|
| 7.1.1 | Installation | 98.1 | 92.4 | -5.8% |
| 7.2.2 | Software Development Service | 91.2 | 98.4 | 7.9% |

**Table 6** - Initial Study: On-Time Service Delivery (OTS) Improvement Trend from initial study

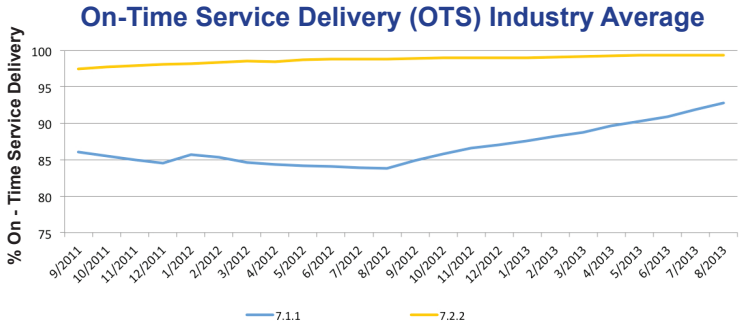


**Figure 7** - Current Study: On-Time Service Delivery (OTS) Industry Average

| Product Category | | 2011-2013 Initial OTI | 2011-2013 Final OTI | Percent Improvement |
|---|---|---|---|---|
| 7.1.1 | Installation | 86.0 | 92.7 | 6.7% |
| 7.2.2 | Software Development Service | 97.4 | 99.3 | 1.9% |

**Table 7** - Current Study: On-Time Service Delivery (OTS) Improvement Trend from current study

**OTIP Monthly Average – Current Study Only**

**On-Time Delivery to Supplier Promised Date**
The study specific to 'On-Time Item Delivery to Supplier Promised Date' (OTIP) is included since the OTIP measurement is a new requirement with release of Measurement Handbook 5.0 early in 2013. However there are not enough months of data to create a smoothing average and as a result a chart is included based on the 'Monthly' averages (non-smoothing actuals) instead. The chart will help contribute and tell the quality story related to the overall suite of the On-Time Delivery measurements since the OTIP is recognized as a valuable up and coming measure within the suite of On-Time Delivery measurements.

**OTIP Current Study:** The Monthly Average (non-smoothing) for the same six products with On-Time Delivery to Promised (OTIP) were reviewed for the current study. Four of the six categories show an improvement trend for the 8 months where data was received (see Table 8).

| Product Category | | 01-2013 Initial OTIP | 08-2013 Final OTIP | Percent Improvement |
|---|---|---|---|---|
| 1.2.2 | Access Multi-Service | 62.4% | 66.9% | 7.3% |
| 1.2.9.2 | Edge Routers | 93.2% | 54.2% | -41.8% |
| 3.3.2 | Base Transceiver System (BTS) | 61.0% | 70.9% | 15.8% |
| 4.2.1 | On-line Critical Operations Support Systems | 100% | 78.1% | -21.8% |
| 5.3 | Power Systems | 76.7% | 79.3% | 3.3% |
| 8.5.2.3 | Optical Subassemblies | 85.8% | 86.4% | 0.6% |

**Table 8** - On-Time Item Delivery to Promised (OTIP) Improvement Trend

**Theories**

Three of the most likely factors that influence OTI are below.
**Macroeconomics:** During a recession, which we saw between the 2008 and 2011, we would expect to see a demand decrease, which should initially cause OTI to improve. If however the suppliers then react to that decrease in demand by decreasing capacity, that would likely cause OTI to deteriorate when demand eventually recovers.

**Order Fulfillment Strategy:** More complex products, such as edge routers, are more likely to be produced with a Make to Order strategy than are less complex products, which are more likely to be produced with a Make to Stock strategy. It should be easier to meet OTI goals with Made to Stock products.

**Customer Expectations:** The OTI metric is performance to Customer Request Date. If customers request reasonable lead times, the OTI metric will be better than if the requested lead time is unreasonably short. The new OTIP metric removes impact of the Customer Request Date from the metric by measuring to promised date.

**Summary**

This analysis of the TL 9000 On-Time Delivery measurement shows the overall industry average declined for On-Time Delivery from the first study to the second study during a recession period in the industry.

With most of the product categories in this study, there was considerable On-Time Delivery improvement from 2007 to 2008. All of these categories exhibited considerable deterioration in their OTI metrics from 2009-2011. Most of recovered in 2012 and 2013. An exception to the recovery was the edge router product category.

There is evidence to support all three stated theories:
**Macroeconomics:** catastrophic OTI decrease in all categories between 2008 and 2011
**Order Fulfillment Strategy:** edge routers (most complex) underperforming other categories
**Customer Expectations:** OTIP (to promised date) outperforming OTI (to request date)

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For additional information on QuEST Forum or TL 9000 please visit www.questforum.org or call +1-972-423-7360.