Optimizing enterprise fulfillment through operations best practices

Global communications in a connected world

The transformation of enterprise fulfillment operations is becoming a necessity for forward-looking CSPs. In this white paper, we share best practices and show how enterprise fulfillment poses a significant opportunity to radically reduce cost and improve the customer experience. In fact, experience shows that these transformation programs can deliver on their promise of cost savings, faster time-to-market, more accurate provisioning, better customer care outcomes and self-service enablement.
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Introduction

Efficient, highly-automated fulfillment of enterprise services is readily attainable. Despite this real optimization opportunity, it continues to elude many Multi-System Operators (MSOs) and Communications Service Providers (CSPs).

Recently, the strength of large corporate enterprises (LCEs) and multi-national corporate services, combined with growing demand for reliable, fully-featured services for Small and Medium Enterprises (SMEs), means providers now have compelling reasons to optimize service delivery to enterprises. The good news is that the successful programs deliver on their promise of cost savings, faster time-to-market, more accurate provisioning, better customer care outcomes and self-service enablement.

For many operators, a key barrier to achieving higher levels of operational maturity is the nature of the enterprise market. The service base is heterogeneous, and volumes are in the thousands instead of hundreds of thousands or millions as is commonplace in the residential market. The service instantiations are complex and enterprise customers demand the highest quality of service (see Figure 1).

Figure 1. The enterprise fulfillment challenge

Addressing these challenges is both a technical exercise and a business operations management exercise. Often, the technical exercises are undertaken as IT projects or as OSS-oriented programs. Many fail to achieve their goals. They look at the problem from the bottom up instead of from the top down, or from an operational point of view. The starting point should be the product portfolio and the operations model. The Key Business Objectives (KBOs) should then be connected to all components of the enterprise fulfillment operation.
At Nokia Bell Labs Consulting, we have a track record of helping CSPs address the enterprise fulfillment challenge. We have advised executive managers and provided managed services that allow CSPs to assert their competitive advantage and tap this lucrative market. We have assisted several CSPs worldwide with fulfillment operations, including an international Tier 1 operator with affiliates in more than 20 countries, an MSO in North America and a wholesale broadband provider in Asia Pacific.

In this paper, we examine the most effective way to build a quality, cost-effective enterprise fulfillment capability. Along the way, we provide examples of implementations with CSPs and their respective outcomes.

Climbing the operations maturity ladder

In order to develop an effective and efficient enterprise fulfillment capability it is essential that CSPs move up the operations maturity ladder. As illustrated in Figure 2, the operations maturity ladder establishes a series of levels that define an organization’s operational performance in terms of productivity and customer experience.

CSPs need to fully complete the prior level before climbing to the next one. For example, this means that a CSP must achieve effective resource management (i.e., resource inventory, resource provisioning and mediation) before rising to the Service level. Similarly, CSPs should have mastered the key components at the Reactive level before stepping up to the Proactive level.

Moving up the maturity ladder is achieved through the pursuit of specific best practices covering the four tenets of operations: people, processes, platforms and metrics.

Figure 2. The operations maturity ladder
Our experience with enterprise fulfillment consulting includes activity-based operations cost analysis. Using this approach, we identified a significantly higher level of duplication and waste at the Ad-hoc or Reactive levels of maturity. At the Proactive level, we observed aspects of variability and a lack of flexibility, which contribute to the inefficient use of resources. At the Service level of operations, tooling, processes and resources are effectively aligned.

Getting the fundamentals right

Ascent of the maturity ladder is accomplished incrementally. In other words, CSPs will fail to move up, if they have not completed the previous step. For example, a CSP that tries to fully automate orchestration without sound data integrity processes will experience excessive fallout. This offsets the efficiency gains from orchestration.

To climb the maturity ladder cost-efficiently, and to successfully address the enterprise fulfillment challenge, CSPs need a sound operational foundation. To do so, they need to respect the following key principles of operations:

1. Standard operational architecture: To implement automation, use a standards-based or standards-compatible operating model to facilitate automation. Commercial OSS products have been developed to conform to standards. An ad-hoc operation that does not conform to standards involves a high degree of customization and home-grown development. As a result, there is a lack of specialization and economy of scale that significantly adds cost and time. Nokia Bell Labs Consulting encountered this issue with a government organization in Western Europe. The organization had developed an idiosyncratic operating model for a small-sized network. They faced a Total Cost of Ownership (TCO) that was not sustainable. The proprietary development, (which was included in a fixed price) and, more importantly, the ongoing cost of support and updates, made this operating model unfeasible.

2. Business intelligence in the platform: The key is not to focus exclusively on the technical platform, but on the business and network intelligence built into platform. Having the “best” and most costly OSS platform is of little value, if the process logic built into the platform does not fit the operator’s processes or its network requirements. Also, a clear understanding of the network is essential as part of platform integration. Nokia Bell Labs Consulting has worked with many CSPs with “state-of-art” commercial OSS platforms; even so, they have been unable to achieve ROI due to either a lack of business intelligence or a poor understanding of the network. These problems include: improper data inventory resulting in inconsistencies, data lag or network misrepresentation, poor modelling of the enterprise fulfillment workflow, or underperforming adaptation layers that make inefficient use of network facilities.
3. Execution and strategic alignment: To align execution with strategy, organizational accountability must be enforced and tied to specific roles and linked to operational outcomes. This is achieved in two ways:
   a. By establishing a metrics framework that maps the strategy and associated KBOs to individual operational outcomes through a hierarchy of KPI/KQIs. Nokia Bell Labs Consulting has encountered many CSPs whose metrics do not align adequately with their KBOs. This results in competitive operational disadvantages.
   b. By establishing accountability within the organization through linking roles to process outcomes and KPIs. Using RACIs/Responsibility Assignment matrices, Nokia Bell Labs Consulting delivered role and functional accountability for a North American MSO—further described in section 6, Accountable organizational structure.

Figure 3. The two tenets of strategy and operations alignment

Best practices for enterprise fulfillment

Maturity improvements are subject to the law of diminishing marginal returns. To address the enterprise fulfillment challenge, it is critical that efforts are focused on those areas that yield the most significant maturity improvements. This is especially important in an industry where cost is a significant competitive advantage and where operations are frequently subject to capital rationing.

At Nokia Bell Labs Consulting, our extensive field-proven experience with CSP engagements has demonstrated that modularity and flexibility are the key factors in the enterprise fulfillment challenge. A widely diverse market with no “one-size-fits-all”—in addition to a market that is low in volume—requires an open, modular product
portfolio. Using pre-built components that closely align with customer needs, this solution must minimize the need for ad hoc, “one-off” solutions. Moreover, openness is required to facilitate the incremental addition of components based on customers’ evolving needs. Based on these factors and on the principles outlined in the previous section, Nokia Bell Labs Consulting has identified a set of best practices (illustrated in Figure 4) to optimize enterprise fulfillment:

1. Flexible fulfillment orchestration
2. SLA-driven exception management
3. Flexible inventory reconciliation
4. Modular active service catalog
5. SLA-driven metrics framework
6. Accountable organizational structure

These practices must be supported outside the fulfillment domain by:

- A modular service portfolio that uses a wide variety of components to address diverse customer needs.
- Custom service productization or the capability of productizing ad hoc, in-demand services and turning them into part of the portfolio.

**Figure 4. Fulfillment best practices**

We turn now to a brief account of the six best practices listed earlier:

**Flexible fulfillment orchestration**

Orchestration automation is the main component of automated fulfillment. Among enterprises, orchestration automation poses a significant challenge owing to the great diversity of services and number of ad-hoc components. Given these challenges, the fulfillment process should be modular, flexible and open.
The idea is to evolve the fulfillment process to Assembly-to-Stock, an intermediate stage between the Make-to-Order/Engineer-to-Order and the Make-to-Stock processes. Engineer-to-Order processes are flexible but suffer from costly, manual intervention. Similarly, the Make-to-Order process has long lead times and the Make-to-Stock process is unsuitable for diverse customer populations. On the other hand, Assemble-to-Order processes can accommodate the need for flexibility with the repeatability required for automation, low-lead time and cost efficiency.

Figure 5. Make-to-Stock compared to Assemble-to-Stock

In sum, the enterprise fulfillment orchestration process should be:

- Modular: Each solution module should have a supporting process flow that can be plugged into the overall orchestration flow.
- Flexible: The component assembly should be a system configuration supervisory activity as distinct from a development activity.
- Open: Components should be easily created in a highly compressed life cycle by an OSS vendor or a third party, including in-house development in order to enable agile productization of ad-hoc features.

Evolution from the Make-to-Order to Assembly-to-Stock stage requires that the portfolio and the supporting catalog enable the same levels of modularity and flexibility. This requirement is discussed in best practice 4—Modular active service catalog.

As discussed in section 1, a flexible fulfillment orchestration approach helps to achieve these modularity and flexibility requirements. For example, Nokia Bell Labs provided consulting services to a Tier-1 multi-national operator that was launching an enterprise fixed-mobile converged service. One of its companies had a wide variety of market segments, which included SMEs and LCEs. The company wanted to overcome its significant cost of fulfillment (and a corresponding increase in TCO). At the same time, it had observed recurring patterns among ad-hoc customer solutions that were not in its original modular portfolio. Recognizing this opportunity, Nokia Bell Labs recommended a productization process that capitalized on these patterns. Using this
process, the company was able to identify candidate solutions, incorporate them into its product portfolio, together with their associated fulfillment process. The result: the Tier 1 operator gained a more flexible and open fulfillment process that was better able to incorporate newly added components.

Figure 6. Flexible orchestration architecture

SLA-driven exception management

The Service Fulfillment Center (SFC) addresses the strict requirements of quality and time for enterprise customers. It does this through proactive monitoring and exception management, as well as resolution management. These stringent requirements for quality and time are achieved by establishing a continuous learning and service improvement loop that increases customer satisfaction.

As part of this continuous improvement loop, proactive monitoring is essential to reach the Proactive step on the operations maturity ladder. Monitoring ensures that process errors are detected before they are reported by the customer. This protects the quality of customer experience and assures that lead times are met. Proactive monitoring also detects exceptions in the fulfillment process, including: fallen out orders, order faults, or orders at risk of fault. In such cases, exception detection triggers exception management. In turn, exception management takes control of the exception-affected order, tracks and controls the exception resolution, and restores the order to the standard fulfillment workflow.

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1 Exceptions are any arisen condition that requires an action
For all of these processes, the SFC is accountable for SLA compliance. As a result, the SFC must control all resources and processes needed to ensure SLA compliance. These include:

- Monitoring fulfillment KPIs and their compliance with SLAs
- Authority to define lower-level fulfillment operational SLTs given the SFC’s role as a mandatory stakeholder on SLA definition
- Power to define rules for exceptions
- Hosting knowledge management and continuous service improvement

**Figure 7. Exception management**

**Flexible inventory reconciliation**

Data integrity is essential for fulfillment of services, particularly in the enterprise market with sophisticated services and high-quality requirements. Data integrity reduces the fallout and exception rate, reducing costs and improving the rating of First Time Right (FTR). The overall result is improved customer experience.

At Nokia Bell Labs, we have provided a Tier 1 Asia Pacific CSP with a service inventory platform. It delivers data integrity through the reconciliation of the network and inventory.
The reconciliation regularly detects deltas between the inventory and the network. It flags these deltas and assigns them to the relevant team for action. Each delta is analyzed, the problem is identified and a corrective course is taken. If the problem is an inventory inaccuracy, the inventory is fixed; if it’s a network issue, the network is fixed. Reconciliation ensures that the unchecked changes from incident management restoration or from casual processes are immediately flagged and acted upon.²

To support reconciliation, a best-industry practice is the use of an operational data store. The operational data store performs the delta analysis without compromising the performance of fulfillment systems.

**Active service catalog**

As noted in best practice 1—Flexible fulfillment orchestration, the evolution of the fulfillment process from Order-to-Stock to Assemble-to-Stock, while at the same time meeting enterprise quality requirements, requires a modular portfolio that can easily incorporate newly productized components. For this to happen, the service catalog that supports the portfolio should be able to support the modularity capabilities used in the portfolio. TM Forum standard 867—Product Service Assembly and Active Service Catalog—defines these capabilities. As a TM Forum member, Nokia and Nokia Bell Labs have extensive experience implementing TMF 867 as part of our portfolio of OSS solutions that we deliver to CSPs.

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² Reconciliation is not a substitute for enforcing configuration and change management in other processes such as incident restoration action review or the population of inventory in provisioning and commissioning processes. Rather, it is an exception management practice to capture instances where these process disciplines have failed.
SLA-driven metrics framework

Enterprise customers’ stringent SLAs and the demand for quality are driving CSPs to better align processes with strategic requirements. As illustrated in Figure 10, these can include contract clauses, regulations, as well as marketing requirement sets. Meeting these demands is a matter of enforcing process compliance with the strategy and KBOs. This is done by assessing process outcomes and ensuring alignment with the SLAs that underpin the requirements. Achieving these outcomes also requires making the organizations that are in charge of the processes accountable.

To effectively assess compliance, process outcomes should be measured and mapped to the KBOs. This is achieved by creating a hierarchical measurement framework. The framework maps low-level operational outcomes to high-level SLAs—in addition to mapping SLAs to strategic requirements and KBOs.
Figure 10. Hierarchical metrics framework

However, the development of this hierarchy can be a time consuming and resource-intensive task. The following set of principles can guide its development:

- **Top-down consistency**: The end-to-end hierarchical structure must consistently tie KBOs with low-level process measurements across all levels (e.g., SLA, KQIs, high-level KPIs etc.)
- **Simplicity**: Consuming performance information can be onerous for senior management. The SLA set should be a small, easily maintained, comprehensive set of metrics that capture most of the KBO/strategic objectives. Re-using industry-standard metrics, wherever possible, is a best practice. For example, the TM Forum has created more than 100 metrics based on dozens of service provider inputs. These metrics can be found in the TM Forum’s BM1000 Business Performance Management System.

Nokia Bell Labs Consulting has incorporated these principles in our operations benchmarking framework. Using this framework, we have provided consulting services to several operators. These include a North American MSO and an Asia-Pacific wholesale provider.

**Accountable roles and functions**

Organizational accountability and strategic alignment with KBOs is also achieved through the implementation of RACI matrices. RACI is an acronym for a project management practice in which stakeholder roles are defined in terms of Responsibilities, Accountabilities, as well as who needs to be Consulted and Informed. The RACI matrix associates key service assurance functions and roles with processes, activities and KPIs in the fulfillment process.
Nokia Bell Labs Consulting has employed RACI matrices to establish role and function accountability for a North American MSO. This project consisted of detailed top-down design, formalizing processes, defining outcomes and KPIs to measure compliance with KBOs. The outcomes were mapped to the organization using a RACI matrix.

Figure 11 illustrates a RACI matrix.

Figure 11. RACI matrix

Quantifiable results from client transformation engagements

Climbing the maturity ladder to the Service level leads to measurable improvements on cost and customer experience for fulfillment. This allows the operator to differentiate on cost and quality, giving it a competitive advantage and generating more revenue.

Using the Nokia Bell Labs Consulting approach of targeting high-yield focus areas minimizes the investment while assuring ROI. This is especially important for service operations where capital rationing is tighter than for network-based operations. Figure 12 shows the benefits of implementing the Nokia Bell Labs Consulting approach. These outcomes are derived from the operators mentioned previously:

3 Details have been eliminated to comply with the Nokia customer information, non-disclosure policy.
Figure 12. Sample outcomes of maturity level improvements on enterprise fulfillment

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<thead>
<tr>
<th>Revenue and margin</th>
<th>Subscriber take up</th>
<th>Fulfillment OPEX/revenue</th>
<th>Fulfillment cost/CLV</th>
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<td>↓</td>
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<tr>
<td>Customer experience</td>
<td>Lead time compliance</td>
<td>↑</td>
<td>Non-compliance: 10 percent to 15 percent decrease</td>
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<tr>
<td></td>
<td>Lead time</td>
<td>↑</td>
<td>10 percent to 20 percent decrease</td>
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<td></td>
<td>Early life reliability</td>
<td>↑</td>
<td></td>
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<tr>
<td>Operations excellence</td>
<td>First time right</td>
<td>↑</td>
<td>5 percent to 10 percent decrease of failures</td>
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<td></td>
<td>Waste (percent rework)</td>
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<td></td>
<td>Fallout rate</td>
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The Nokia Bell Labs service assurance consulting value proposition

Nokia Bell Labs Consulting\(^4\) provides trusted guidance to take CSPs’ assurance operations to a higher level of maturity with the adoption of industry best practices. Supported by our transformation methodology, we have helped CSPs identify the most effective way to build a quality, cost-effective service operation to achieve competitive advantage in a market that demands customer experience and relentless innovation.

Figure 13 illustrates our transformation methodology, as well as its stages and deliverables. Each stage provides carefully defined and agreed-upon deliverables to ensure all stakeholders remain aligned. Assessment and definition processes are used at each stage. This enables CSPs to clearly understand and identify objectives, quantify results and mitigate risks.

Our methodology consists of the following stages:

- Identification of operational transformation KBOs and definition of key transformational operations metrics
- Assessment of enterprise fulfillment operations at the customer, service and resource levels to identify the Present Mode of Operation (PMO)
- Definition of the best fitting Future Mode of Operation (FMO) to adopt the best practices that provide the highest improvement returns.

\(^4\) Nokia Bell Labs Consulting provides vendor-agnostic consulting services.
• Definition of the path, if necessary, from PMO to FMO, including the intermediate stages of the journey as the Interim Mode of Operation (IMO)

• Evaluation of the changes’ impacts on cost and customer experience, including business processes, metrics and the OSS/IT infrastructure. Quantification of the transformation recommendations against the KBOs.

Figure 13. Nokia Bell Labs transformation consulting methodology

The operational planning work streams are managed simultaneously to ensure coordination, as well as the speed of decision making. The final deliverable provides customers with a financially sound and market-aligned approach for the staged transformation to the Service level. This deliverable is detailed so that it can be implemented immediately. The duration of each stage ranges from one to three weeks, depending on the complexity of the operation.

Conclusion

Enterprise fulfillment operations transformation is clearly complex and challenging. Nokia Bell Labs Consulting, working in concert with CSPs, has transformed enterprise fulfillment operations by moving them up the operations maturity ladder. These transformation programs have included the integration of operating companies and the optimization of existing or planned infrastructure.

In this white paper, we have shared best practices and shown how enterprise fulfillment poses a significant opportunity to radically reduce cost and improve the customer experience.
About the authors

Carlos Oliver, Principal Consultant, Nokia Bell Labs Consulting, is a London Business School EMBA candidate. He has 15 years of telecom experience in professional services and consulting. He has specialized in advising CXOs in technology strategy and operations. Mr. Oliver created the Capability Reference Operating Model (CROM).

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The authors have written the white paper, Best practices for achieving service assurance excellence. This paper covers the most effective way to turn your network-focused operations into a successful service assurance operation. It also presents the best practices to overcome these challenges.

Abbreviations

ATO  Assembly-to-order
CROM  Capability Reference Operating Model
CSP  Communications Service Providers
ETO  Engineer-to-order
eTOM  Enhanced Telecom Operations Map
FMO  Future Mode of Operations
FTR  First Time Right
IMO  Interim Model of Operations
ITIL  Information Technology Infrastructure Library
KEDB  Known Errors Database
KBO  Key Business Objectives
KQI  Key Quality Indicator
LCE  Large Corporate Enterprise
MSO  Multi-System Operators
MSOM  Managed Services Operating Model
MTBF  Mean Time Between Failures
MTBI  Mean Time Between Interruptions
<table>
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<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tr>
<td>MTO</td>
<td>Make-to-order</td>
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<td>MTS</td>
<td>Make-to-stock</td>
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<td>MTTR</td>
<td>Mean Time To Repair</td>
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<td>NOC</td>
<td>Network Operations Center</td>
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<td>OSS</td>
<td>Operational Support Systems</td>
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<td>PMO</td>
<td>Project Management Office</td>
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<td>QoE</td>
<td>Quality of Experience</td>
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<td>QoS</td>
<td>Quality of Service</td>
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<tr>
<td>RACI</td>
<td>Responsible, Accountable, Consulted, Informed</td>
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<td>Service Fulfillment Center</td>
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<td>Service Level Agreement</td>
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<td>Service Level Agreement Management</td>
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<td>SMC</td>
<td>Service Management Center</td>
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<td>SME</td>
<td>Small-Medium Enterprise</td>
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<tr>
<td>T2R</td>
<td>Trouble-to-Resolve</td>
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<tr>
<td>TCO</td>
<td>Total Cost of Operation</td>
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<tr>
<td>WFM</td>
<td>Work Force Management</td>
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