

Telco Business Process Transformation using Agile Lean Six Sigma and Framework components: focus on the core engineering aspects with a case study

Mounire Benhima¹, Abdelaâli Himi², Camille Ameyao³, and Edwige Ahonie Adou⁴

¹ Eng., M.Eng, Member of TM Forum Trainers Panel / Business Transformation Subject Matter Expert, POWERACT Consulting
Casablanca, Morocco

² Eng., MSC. BPM Expert / Business Transformation Subject Matter Expert, Intellectus Consulting Services
Casablanca, Morocco

³ Senior Manager MTN Business Service Delivery / Project Manager
Abidjan, Ivory Coast

⁴ MSC., Business Sales and Reporting Expert MTN Business / Project Coordinator
Abidjan, Ivory Coast

Abstract

The business transformation, a worldwide trend in many industries, is to improve the business performance in order to remain competitive in a challenging market. To accompany Telco industry in this trend, TM Forum issued Framework which addresses the key business aspects namely process, information, application and integration ones. The purpose of this paper is to present a methodology for Telco business process transformation harmonizing Framework and Lean Six Sigma (L6S) since it is well proven methodology supporting this transformation. This harmonization increases the L6S agility. The focus of the current paper is on the Define phase of L6S, with some highlights about other phases, supported by a case study. The Define phase activities all together are named "Core Engineering aspects".

Keywords: Business Process design, Business Process reengineering, Business Process Optimization, Business Process Performance, Framework, eTOM, Business Metrics, Lean Six Sigma, Project Charter, Change Management, SIPOC, Business Process Flow, VSM, Voice of Customer, Critical To Quality, Root cause analysis, Fishbone, The Seven Wastes, Customer Experience, Operational Efficiency and Revenue & Margin.

1. The Business Transformation, De Facto solution for the challenges of the TELCO industry

In the dynamic of the TELCO industry, there are multiple types of actors including, to name some of them, content providers, terminals and equipment vendors, , integrators, social networks providers, service providers, TELCO products distributors and any TELCO provider or consumer. These types all together make the TELCO value chain.

This industry is today under the pressure of a changing and challenging business context (Ex.: Customer Experience challenges and social media, quick changes with mergers and acquisitions, new unexpected entrants, new technologies, margins compression, operational efficiency, cost optimization) which threatens the competitiveness and even the survival of an actor.

Given such dynamics, TELCO industry players are more and more adopting the solution « Business Transformation» to overcome the challenges of such a business context. This increasing adoption is justified by its practical relevance and the very positive feedback from the market with several real case studies. Indeed, companies who adopted and implemented this solution have seen a return (ROI) and value (VOI) on Investment. In a subsequent section, a "Success Story" will be presented with the obtained ROI and VOI. The key

elements subject to transformation, as presented in the Figure1, are the Business Model and Product Portfolio, Customer Experience, Business & Staff Culture, Business Processes, IT & systems and infrastructure.

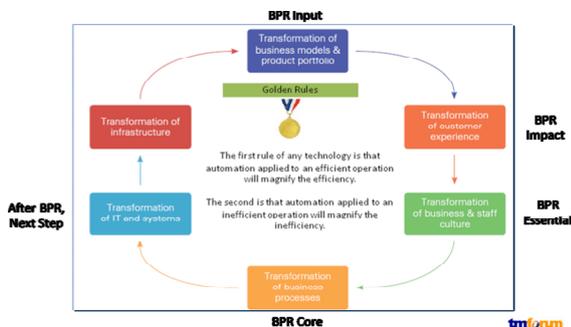


Figure1: Key elements subject to Business Transformation

2. How to accelerate Business Transformation?

In a world characterized by responsiveness and speed, it is very natural to ask how to accelerate Business Transformation? The TELCO industry adopts massively TM Forum Framework as an accelerator for this transformation.

Today 8 of the Top 10 worldwide service providers use and adopt Frameworkx. This adoption is justified, as previously explained, by the ROI and VOI obtained with the slogan «Do not start your transformation initiatives from scratch, use tmforum Frameworkx as an efficient and reliable accelerator».

TM Forum Frameworkx, as shown in the Figure2, and its components (called Frameworks) answer four key concerns related to the business transformation. First, The Business Process Framework (eTOM) answers the concern «How to improve / structure / define the business processes supporting the Business? ». Secondly, the Information Framework (SID) answers the concern «How to improve / structure / define the information manipulated by the business processes? ». Then, the Integration Framework (TNA) answers the concern «How to improve / structure / define the interaction between my business processes & the manipulated information and how to support the application development? ». Finally, the Application Framework (TAM) answers the concern «How to improve / structure / define the applications supporting my business processes? ».

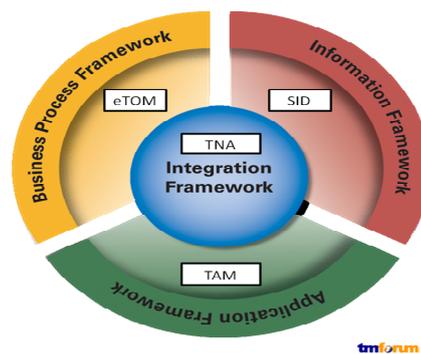


Figure2: Frameworkx and its key components

And to measure the business performance, TM Forum issued the Business Metrics Framework. This framework is composed of three major performance domains with their related metrics. These three, the pillars of the balanced scorecard, are:

- The Customer Experience
 - Metric example: % Orders Delivered By Committed Date (ID:F-CE-2c)
- The Operational Efficiency and
 - Metric example: Fulfillment Process Cost As % OpEx (ID: F-OE-1c)
- Revenue & Margin.
 - Metric example: OpEx / CapEx (ID: G-RM-2)

3. How to start Business Transformation for inefficient operations?

The startup of the Business Transformation for inefficient operations, as mentioned in Figure1, is based on two golden rules. The first rule is that «automation applied to an efficient operations will magnify the efficiency» Bill Gates. The second rule is that «automation applied to an inefficient operations will magnify the inefficiency» Bill Gates. Based on these golden rules, the starting point to transform inefficient operations is the Business Process Reengineering (BPR) with the Slogan «Improvement before automation». BPR is being widely used jointly with Lean Six Sigma Methodology for better process optimization.

4. The BPR and process decomposition

In the engineering world, the architecture development of the work to be done is crucial and fundamental «I Plan my work first» and represents a fundamental principle. The BPR, part of this world, follows by syllogism this principle. Therefore, the business process architecture should be developed. This architecture breaks down and decomposes activities into several levels (0, 1, 2, etc).

In order to support the development of such a process architecture and decomposition, many key actors in the TELCO industry have chosen eTOM.

5. About eTOM

eTOM provides a standard process architecture, terminology, classification scheme and decomposition hierarchy. eTOM covers all business activities, with more detailed aspects than others, to meet the needs and interests of the TELCO industry with its major trends.

The eTOM suggested process architecture, as shown in Figure3, is composed of three Process areas. First, The Strategy, Infrastructure & Product Process Area includes processes that develop strategy, commit to the enterprise, build infrastructure, develop and manage products, and that develop and manage the Supply Chain. In the eTOM, infrastructure refers to more than just the IT and resource infrastructure that supports products and services. It includes the infrastructure required to support functional processes, e.g., Customer Relationship Management (CRM). These processes direct and enable the Operations processes.

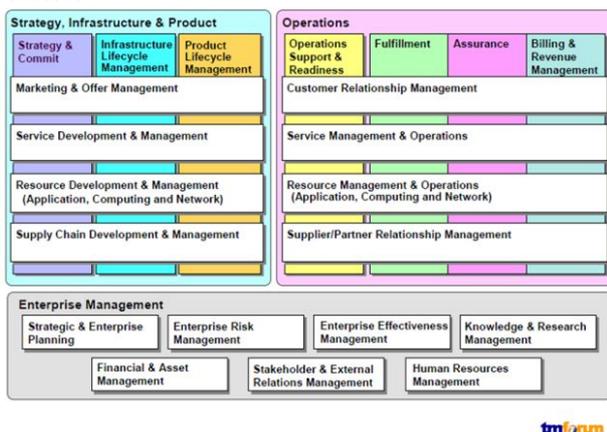


Figure3: The Business Process Framework (eTOM)

Then, the Operations (OPS) process area contains the direct operations vertical end-end process groupings of Fulfillment, Assurance & Billing (the FAB process groupings), together with the Operations Support & Readiness process grouping. The FAB process groupings are sometimes referred to as Customer Operations processes.

Then, the Enterprise Management Process Area includes basic business processes required to run any business. These processes focus on Enterprise Level processes, goals and objectives. These processes have interfaces with almost every other process in the enterprise, whether operational, product or infrastructure processes. These are sometimes considered corporate functions and/or processes, e.g., Financial Management, Human Resources Management processes, etc.

The three process areas are further decomposed into further levels of decomposition which could be customized. Thus, eTOM is an open Framework allowing the specific needs of a given company to be integrated in it.

6. The BPR and process flows

The BPR starts by developing a process architecture and decomposition as previously explained. This architecture/decomposition is made of process elements which form a library. Initial process flows could be constructed by selecting the appropriate process elements from the library based on the business context to model. For detailed process flows, a detailed descriptive sheet will be elaborated for each process element. This sheet is simply named a Use Case. The key elements of a use case are the Name, Goal, Description, Actors, Pre-conditions, Triggers, Essential steps, Manipulated information, Post-conditions and Business rules.

All the use cases, within the scope of work, will form the Use Cases repository.

To build a process flow, a set of use cases suitable to the business context to model will be selected from the use cases repository. Then the process flow will be an orchestration, via a sequence, of the related use cases.

7. Lean Six Sigma (L6S) in a nutshell¹

7.1 Introduction

Lean Six Sigma is a step by step methodology to optimize the process performance. The methodology steps, known as DMAIC, are:

- **Define:** the main purpose is to define the project, the team and the process
- **Measure:** the main purpose is to validate the measurement system and collect process data
- **Analyze:** the main purpose is to analyze the process data in order to identify the root causes for the problems and non performance
- **Innovate:** the main purpose is to find, assess and launch the process improvements ideas
- **Control:** the main purpose is to ensure a sustainable process improvement

7.2 Define Phase: Activities and Deliverables

The key activities related to the Define Phase are:

- Set project goal (s)
- Define the project objectives
- Define the project scope

¹ www.excellence-operationnelle.tv

- Elaborate the financial impact
- Set the project organization and planning
- Perform the Kick-off meeting
- Capture the process organization using SIPOC (Suppliers, Inputs, Process Steps, Outputs, Customers)
- Build the high level business process flow and identify/designate the process Owner (s)
- Capture the Voice Of Customer which highlights the customer needs
- Identify the Critical To Quality (CTQ) where measurable performance indicators are defined for the customer needs.
- Elaborate the change management essential charters which are:
 - Communication Charter
 - Leadership/Sponsorship Charter
 - Organization Optimization Charter
 - Sustainable Change Charter
- Identify the quick wins
- Perform a quality gate review for the Define Phase

The key deliverables related to the Define Phase are:

- Project Charter
- Kickoff meeting presentation
- SIOC
- High Level process flow
- Process accountabilities defined:
 - Owner (s) defined
 - Virtual Process Owner (s) for end to end processes identified if applicable
- Voice Of Customer
- Critical To Quality
- Change Management Essential Charters
- Pareto Analysis
- Quality gate review for the Define Phase

7.3 Measure Phase: Activities and Deliverables

The key activities related to the Measure Phase are:

- Build the Value Stream Map where process steps and their related performance data are captured
- Build the process performance Data Collection file which integrate data to calculate the measurable performance indicators identified in the CTQ
- Validate the measurement system
- Collect the process performance data
- Calculate the baseline process performance
- Perform the first process analysis in order to identify the trends to deepen during the Analysis Phase
- Identify the quick wins if any
- Refine the deliverables of the previous phase (s) where applicable

The key deliverables related to the Measure Phase are:

- Value Stream Map (VSM)
- Process performance data file designed and filled with a sample of process records
- Baseline process performance or capability calculated and communicated using suitable means (Ex. Graphs). The capability makes the link between what the process is capable to do and the customer needs.
- Quality gate review for the Measure Phase

7.4 Analyze Phase¹: Activities and Deliverables

The key activities related to the Analyze Phase are:

- Generate a list of possible causes (Xs) for non process performance
- Prioritize the list of causes
- Verify the root causes of variations
- Assess the impact of each X on the performance indicators (Ys)
- Quantify the Gap/Opportunity:
 - Determine the performance gap

¹ <http://www.isixsigma.com/new-to-six-sigma/dmaic/six-sigma-dmaic-quick-reference/>

- Display and communicate the gap/opportunity in financial terms
- Identify the quick wins if any
- Refine the deliverables of the previous phase (s) where applicable

The key deliverables related to the Analyze Phase are:

- Process performance graphs with the variation, Pareto Diagram, Results analysis
- Fishbone Diagram with the 5 Whys filled for the critical measures
- 7 wastes identified
- FMEA1 (Failure Mode and Effect Analysis) with the potential causes for the non process performance
- Correlations graphs between (Xs) and (Ys)
- Quality gate review for the Analyze Phase

7.5 Innovate Phase: Activities and Deliverables

The key activities related to the Innovate Phase are:

- Confirm the critical X (s)
- Generate the potential solutions
- Select the solution
- Optimize the solution
- Perform Risk Analysis
- Perform a pilot run of the solution
- Identify the quick wins if any
- Refine the deliverables of the previous phase (s) where applicable

The key deliverables related to the Innovate Phase are:

- FMEA2 (Failure Mode and Effect Analysis) with the action plan for the improvement areas
- The To-Be VSM
- The To-Be Process Flow (s)
- The To-Be Procedure (s) and Work Instruction (s)
- Solution Selection Matrix
- Pilot Project and simulation

- Implementation strategy
- Risk Management

7.6 Control Phase: Activities and Deliverables

The key activities related to the Control Phase are:

- Develop a Control Plan
- Implement the process changes, controls and documents
- Calculate the final financial and process measures
- Handover the project the process accountable (s)
- Identify the
- Identify the quick wins if any
- Refine the deliverables of the previous phase (s) where applicable

The key deliverables related to the Control Phase are:

- A finalized Action plan. This action plan could be used as a control plan for the remaining elements to master
- The To-Be procedure validated by the stakeholders
- The process users trained about the To-Be procedure
- Process Control Card (s) to track and maintain the characteristics influencing the process performance at a standard level

8. The L6S Project Streams

The suggested project streams are as follows:

- Business Architecture and Excellence Stream
 - The goal is to handle business architecture and lean six sigma activities
- eTOM/ITIL Standardization Stream
 - The goal is to handle the eTOM/ITIL alignment activities of the To-Be process design
- Essential Aspects Stream

- The goal is to handle the activities related to change management and its sustainability
- QA and Deliverables Stream
 - The goal is to ensure that the deliverables are compliant with the methodology activities and deliverables
- Next Phase Readiness Stream
 - The goal is to ensure the readiness for the coming. This readiness is about collecting any required information and ensuring the availability of the customer stakeholders for the coming phase.

For this project Stream (s), RACI (Responsible, Accountable, Consulted, and Informed) is applied to identify the project accountabilities.

9. Methodology rules: Focus on the Brainstorming Workshops

While executing the methodology phases, many brainstorming workshops will be performed. As a best practice¹, the following rules have to be reminded at the beginning of each brainstorming workshop:

- Think freely
- All the ideas have the same value
- Do not criticize
- One idea = One Post-It
- Develop other's ideas
- Display all the ideas

10. L6S applied to Telco: Define Phase

The application of the Lean Six Sigma to Telco will be a harmonization between L6S and Framework with other tools. The focus of this harmonization will be on the L6S Deliverables.

The case study is about improving the Order To Cash/Payment related to the MTN Business operations in the Ivory Coast.

¹ www.excellence-operationnelle.tv

10.1 Project Charter

The project charter components are:

- Project Identity
- Project Description
- Key Project Performance Data
- Objectives/Performance Indicators
- Project Scope
- Financial Impact
- Project Organization
- Project Plan

Support Documents

The support Framework documents for "Project Charter" are:

- *GB921E*: it contains end to end business flows from different perspectives: Customer, Network and Product
- *QSP* for: Fulfillment, Assurance and New Services
- *Introductory Guide* (s) for PLM
- *Business Metrics*: Which contains the list of business metrics divided into three performance domains (Customer Experience, Operational Efficiency and Revenue&Margin)
- *GB921*: D and DX for eTOM decomposition and J for process flow design and context.
- RACI tool

Snapshots from Support Documents

Below are some snapshots, from the support documents, that can be used for this item.

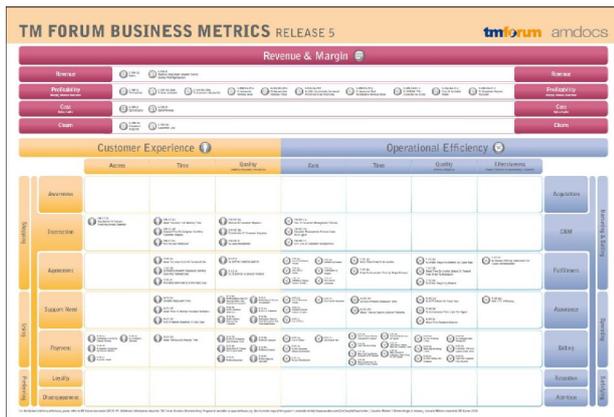


Figure4: The Balanced Scorecard with the related metrics, Source : TM Forum

The above Figure shows the three performance domains making the balanced scorecard with their related metrics. These domains are Customer Experience (Metric example: % of Orders Delivered by Committed date), Operational Efficiency (Metric example: Mean Time Order To Activation) and Revenue & Margin (Metric Example : ARPU).

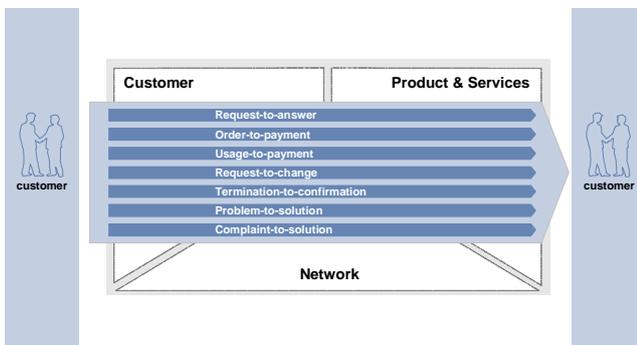


Figure5: Customer-Centric End-To-End Business Streams. Source : TM Forum

The above figure shows the Customer-Centric End-To-End business streams:

- Request-To-Answer
- Order-To-Payment
- Usage-To-Payment
- Request-To-Change
- Termination-To-Confirmation
- Problem-To-Solution
- Complaint-To-Solution

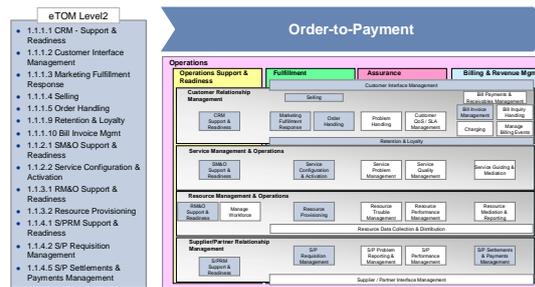


Figure6: Mapping of Order To Payment in eTOM, Source: TM Forum

The above figure shows the mapping of the Business Stream “Order To Payment” with eTOM Level2 (s).

Metric ID	Metric Purpose	Numerator	Denominator
F-CE-2a	Mean Duration to Fulfill Service Order	Time from order placement to customer acceptance	Number of completions accepted by customers
F-CE-2b	Mean Time Difference Between Customer Requested Delivery Date and Planned Date	Sum of time from Customer Requested Date to Customer Committed Date	Sum of time for all installation commitments
F-CE-2c	Percentage of Orders Delivered by Committed Date	Number of deliveries or activations fulfilled by committed date	Total deliveries or activations in reporting period
F-CE-5	Percentage of Service Usability Queries	Number of customer contacts relating to usability of installed service	Total deliveries or activations in reporting period
F-CE-4	Percentage of Service Activation Failures	Failed, reposed, and problem reported activations or deliveries	Total deliveries or activations in reporting period
F-CE-4b	Percentage of Early Life Failures	Number of customer accepted orders that fail within the first 28 days	Number of orders accepted by customers in period
F-OE-2a	Mean Time Order to Activation	Aggregate time from order date to customer acceptance closed	Number of completions accepted by customers
F-OE-2b	Order to Activation Time by Major Process	Overall time from order to activation broken down by major process	Number of completions accepted by customers
F-OE-3a	Percentage of Orders Requiring Rework by Cause Type	Number of orders requiring rework from Order to Activation by cause	Total number of orders
F-OE-3b	Mean Time to Handle Defects or Rework from Order to Customer Acceptance	Aggregate time to resolve detected and rework from order to acceptance	Total number of hours
F-OE-3d	Percentage of Orders Pending Error Fix	Total number of orders with pending error fixes	Total number of orders with errors

Figure7: Metrics related to the business stream Order To Payment, Source : TM Forum

The above figure shows the metrics related to the business stream Order To Payment. These metrics are derived from the balanced scorecard previously presented.

Level 2 Process	Level 3 Process Element	F-CE-2a	F-CE-2b	F-CE-2c	F-CE-4	F-CE-4b	F-OE-2a	F-OE-2b	F-OE-3a	F-OE-3b	F-OE-3d
CIM	Manage Contact										
	Manage Request				X	X	X				
	Analyze & Report on Customer										
Selling	Mediate & Orchestrate Customer Interactions										
	Manage Prospect										
	Qualify Opportunity										
	Negotiate Sales/Contract	X	X				X	X	X	X	X
MFR	Acquire Customer Data										
	Cross/Up Selling										
	Develop Sales Proposal										
OH	Manage Sales Accounts										
	Issue & Distribute Marketing Collaterals										
	Track Leads										
	Authorize Credit										
RL	Close Customer Order										
	Complete Customer Order										
	Determine Customer Order Feasibility		X	X							
RL	Issue Customer Orders										
	Report Customer Order Handling										
	Track & Manage Customer Order Handling					X				X	X
	Establish & Terminate Customer Relationship										
RL	Build Customer Insight										
	Analyze & Manage Customer Risk										
	Personalize Customer Profile for Retention & Loyalty										
	Validate Customer Satisfaction	X	X	X	X	X	X	X	X	X	X

Figure8: Order-To-Payment eTOM processes with related Metrics (Part), Source : TM Forum

The above figure shows the eTOM process elements (Level2 and 3) involved in Order To Payment with their related metrics.

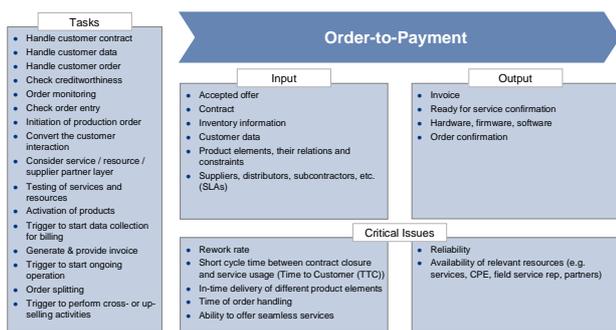


Figure9: Order To Payment Detailed information, Source: TM Forum

The above figure shows detailed information about the business stream Order To Payment.

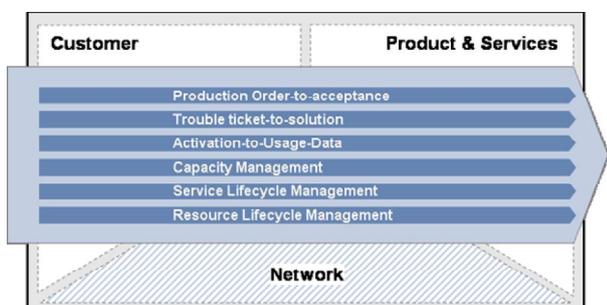


Figure10: Network-Centric End-To-End Business Streams, Source : TM Forum

The above figure shows the Network-Centric End-To-End business streams which, as stipulated by TM Forum, are:

- Production Order-to-acceptance
- Trouble ticket-to-solution
- Activation-to-Usage-Data
- Capacity Management
- Service Lifecycle Management
- Resource Lifecycle Management



Figure11: Product-Centric End-To-End Business Streams, Source : TM Forum, Tribold

The above figure shows the Product-Centric End-To-End business streams which, as stipulated by TM Forum, are:

- Develop Product Strategy
- Design & Develop Products
- Monitor & Update Products

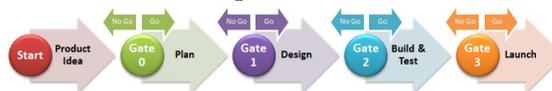


Figure12: Design & Develop Products Stages/Gates, Source: TM Forum, Tribold

The above figure shows the Stages related to the Business Stream “Design & Develop Products”:

- Product idea-to-plan (idea is ready for planning)
- Product plan-to-design (Plan is ready or design)
- Product design-to-build&test (Design is ready for Build&Test)
- Product Build & Test-to-launch (Build is ready for launch)

Project Identity

A template, with an initial filled content, of this item could be as follows:

PROJECT Name	Ex. : Improvement of the Order To Cash/Payment process
Project Responsible	
Function	
Sponsor	
Project Coordinator	

How to use the support documents?

- Project Name could be derived from the Business Stream names and content
- Project Name could be derived from the Business Metrics names and content, or
- A combination of Business Stream and Business Metrics names and content

Example

- Project Name could be, as mentioned in the template, “Improvement of Order To Cash (Payment)”. Order To Payment is

one of the Business Streams previously presented.

Project Description

A template, with an initial filled content, of this item could be as follows:

Description du projet :	The Order To Cash, and end-to-end business stream, is a transverse process going from receiving the customer order till issuing the customer bill. This process needs to be more agile in order to improve customer experience, operational efficiency and revenue & margin.
--------------------------------	--

How to use the support documents?

- The Project description could be derived from the Detailed information related to the Business Streams and Business Metrics.

Example

- The project description, as mentioned in the template, is derived from the Figures 4, 5, 6 and 7.

Key Project Performance Data

A template, with an initial filled content, of this item could be as follows:

Key Project Performance Data	<p>Revenue Breakdown:</p> <ul style="list-style-type: none"> • Customer Segment: B2B • Service : Optical Fiber <p>Average Monthly Fees per customer for optical fiber:</p> <ul style="list-style-type: none"> • X Euro (s)
-------------------------------------	---

How to use the support documents?

- The performance data fields could be derived from Business Metrics.

Example

- The key Project Performance Data field (s), as mentioned in the above template, was derived from the Metric Revenue Breakdown part of Business Metrics.

Objectives/Performance Indicators

A template, with an initial filled content, of this item could be as follows:

Objectives/Performance Indicators	<ul style="list-style-type: none"> *) Increase % of orders delivered by committed date *) Decrease Mean Time Order To Activation *) Decrease % of Orders requiring technical reworks
--	--

Concepts

- An objective is generally formulated as follows:
 - **Increase/Decrease/Stabilize** performance_metric

How to use the support documents?

- These objectives could be derived from Business Metrics, QSP (for: Fulfillment, Assurance and New Services) and Introductory Guide (s) for PLM.

Example

- The project description, as mentioned in the template, is derived from the Figures 4, 7 and 8.

Project Scope

A template, with an initial filled content, of this item could be as follows:

Project Scope	<p>The Order To Cash process scope is:</p> <ul style="list-style-type: none"> *) Geography: MTN Business, Ivory Coast; *) Customer Segment: B2B; *) Products/Services: Optical Fiber; *) Execution Time: Normal flow (Fast Track is out of scope); *) Channel: ... ; *) Triggers: ...
----------------------	--

How to use the support documents?

- The project Scope could be derived from GB921E, QSP (For: Fulfillment, Assurance, New services) and Introductory guide (s) (Ex.: for PLM), GB921D, GB921DX, eTOM and

Business Metrics posters and GB921J for process context.

Example

- The project Scope key fields, as mentioned in the above template, was derived from GB921J.

Financial Impact

A template, with an initial filled content, of this item could be as follows:

Financial Impact			
Improvement area	Baseline As-Is	Impact	Impact Cost (Euros)
Increase % Orders delivered by committed date	The current performance	<u>Win</u> Days of service usage <u>Avoid</u> Delay in billing Revenue loss	Impact of one day lost = X (monthly fees per customer)/30 days Euros
...			

How to use the support documents?

- The financial impact improvement areas could be derived from the project objectives/indicators.

Example

- As mentioned in the template, Increase % Orders delivered by committed date is derived from the project objectives/indicators and followed by a brainstorming session to fill the impact and its cost for example the cost of one day lost (Euros) is equal to X (monthly fees per customer) divided by 30 days.

Project Organization

Support Documents

- The definition of project organization could be supported by:

- The L6S Project Streams previously presented
- RACI Tool

10.2 SIOC

The SIPOC is related to process and its components are:

- Suppliers
 - Who provide the inputs?
- Inputs
 - What are the inputs for the process
- Process Steps
 - What are the process steps?
- Outputs
 - What are the process results?
- Customers
 - To whom the results are intended to?

Support Documents

The support Framework documents for the SIPOC are:

- GB921D and DX for eTOM decomposition
- GB921E : for end to end business streams
- GB921F : for process flows examples
- QSP for fulfillment, Assurance and new services
- Introductory guide for PLM
- Business Metrics

Snapshots from Support Documents

Below are some snapshots, from the support documents, that can be used for this item.

(3) eTOM Process Type Issue Service Orders

Brief Description
 Issue correct and complete service orders

Extended Description
 The purpose of the Issue Service Orders processes is to issue correct and complete service orders. The service orders may be required to satisfy pertinent customer order information received, may arise as a result of requests for service provisioning to satisfy service problem recovery activities, may arise to alleviate service performance issues, or may arise as a result of information received from suppliers/partners in relations to specific services. These processes assess the information contained in the customer order, through a service order request, relating to the purchased product offering, initiating service process or supplier/partner initiated request, to determine the associated service orders that need to be issued. The issued service order may require a service feasibility assessment or a service design to be produced, may require new provisioning activities for specific services, may require a change to a previously issued service order, or may require deletion and/or recovery of previously delivered specific services. Where, the initiating request or the purchased product offering has a standard set of associated service orders this process is responsible for issuing the service orders, and for creating a record of the relevant initiating request or customer order information and the associated service orders. Where the initiating request or the purchased product offering has special or unusual requirements, and a specific feasibility assessment and/or service design has been previously created, this process is responsible for issuing the service orders, and for creating a record of the relevant initiating request or customer order information and the associated service orders. Where the purchased product offering has special or unusual requirements, and a specific feasibility assessment and/or specific service design has not been previously created, this process marks the issued service order as requiring special handling, and passes management for further processing to the Track & Manage Service Provisioning process. The orchestration, if required, and tracking of the service order progress is the responsibility of the Track & Manage Service Provisioning processes.

Figure13: Issue Service Order details (GB921D)
 Source: TM Forum

The above figure shows details about the process element (eTOM Level3) obtained from GB921D.

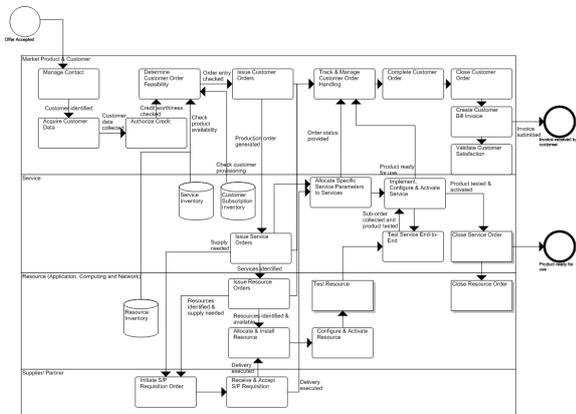


Figure14: Order-to-Payment – Process-Flow (L3)
 BPMN Source: TM Forum

The above figure shows process flow related to Order To Payment. In the process flow, inputs and outputs are shown.

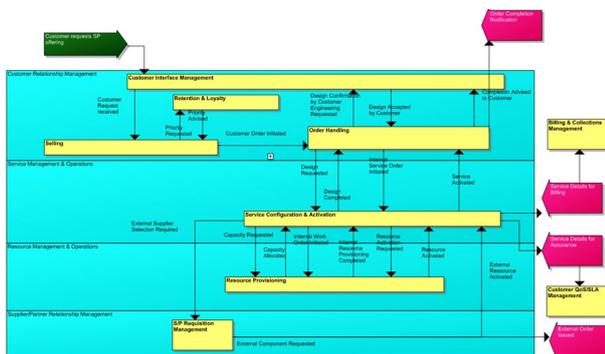


Figure15: Fulfillment Flow - Level 2 Ordering
 Process Flow, Source: TM Forum

The above figure shows an example of Fulfillment Flow - Level 2 Ordering Process Flow where some inputs and outputs could be identified.

SIPOC

A template, with an initial filled content, of this deliverable could be as follows:

SIPOC: Order To Cash (Extract)				
Supplier	Input	ProcessTask (s)	Output	Customer
Customer	Customer Order	Receive Customer Order	Customer Order	Sales
Customer Care	Validated Customer Order	Issue Service Order
Customer	Customer Service configuration done	Test the service with customer	Delivery Slip	Customer
Customer	Signed Delivery Slip	Get Signed Delivery Slip	Signed Delivery Slip	Customer Care

Flow 1:
If

How to use the support documents?

- SIPOC elements could be derived from the extended description related to eTOM process elements (GB921D and DX) and from process flows (GB921E, F ...) where many inputs are shown.

Example

- As mentioned in the template, Validated Customer order Input, could be derived from Figure13.

10.3 High Level process flow

The high level process flow shows the interaction between the process elements involved in Order To Cash (Payment). The flow shows the sequence in which the process elements should be executed.

Support Documents

The support Framework documents for this Deliverable are:

- GB921E : for end to end business streams
- GB921F : for process flows examples
- QSP for fulfillment, Assurance and new services
- Introductory guide for PLM
- GB921J for process flow design guidelines and context

Example

- The Figure14 shows a process flow related to the Order To Cash.

10.4 Process accountabilities

To define process accountabilities, eTOM process elements could be used in combination with RACI tool.

Support Documents

The support Framework documents for this Deliverable are:

- GB921D, DX
- GB921E
- QSP for Fulfillment, Assurance and New services
- Introductory Guide (s) for PLM

Process accountabilities

A template, with an initial filled content, of this deliverable could be as follows:

eTOM process element	R (Responsible)	A (Accountable)	C (Consulted)	I (Informed)
Selling	Sales	Sales	Service Management ...	Service Management ...
...
Service Configuration & Activation	Service Management	Service Management
...

How to use the support documents?

- The support documents will provide the appropriate process elements within the project scope
- To these elements, RACI is applied.

Example

- The eTOM process elements in the Process accountabilities, as mentioned in the template, are derived from GB921E.

10.5 Voice Of Customer (VOC) and Critical To Quality (CTQ)

The voice of customer consists of identifying the key customer needs. To identify these needs, the

touch points between the customer and the service provider, in the project scope, should be analyzed.

To prioritize customer needs, Pareto analysis could be used.

CTQ will define the measures/indicators to be associated with the key customer needs.

Support Documents

The support Framework documents for this deliverable are:

- GB921E
- QSP for Fulfillment, Assurance and New Services
- Introductory guide for PLM
- CEMGB962 : is about Introduction and Fundamentals related to the Customer Experience Management

Snapshots from Support Documents

Some selected snapshots related to these support documents are shown in the figures 5, 10, 11 and 12.

VOC

A template, with an initial filled content, of this deliverable could be as follows:

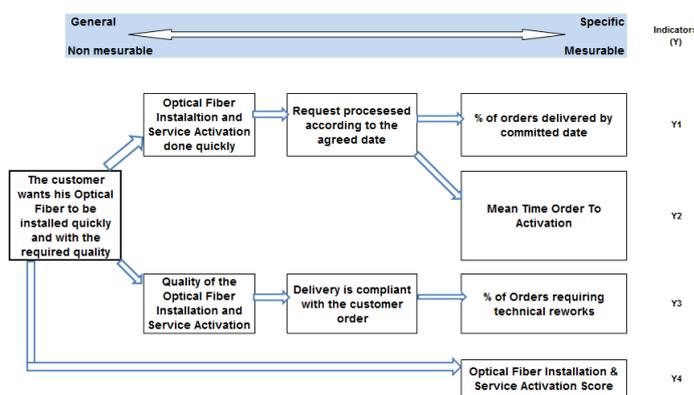


Figure15: Voice Of Customer and CTQ related to the case study

How to use the support documents?

To help identifying the customer needs:

- End to end business streams could be used
- Customer Experience (CE) performance domain, part of Business Metrics, could be used especially the topics related to CE.
- Customer Surveys (internal, via third parties)
- Pre-Sales
- Sales
- Customer Service

Example

As mentioned in the template, the voice of customer was identified:

- Using the three sub-domains related to the customer experience performance domain (Access, Time, Quality), and
- The feedback of the internal departments interacting with the customer.

And CTQ/Performance indicators were obtained using TM Forum Metrics which were customized to meet specific needs related to MTN Business Operations.

10.6 Change Management Essential Charters

The change management essential charters components are:

Communication Plan

The template for the communication plan is as follows:

Stakeholders	Communication type (Targeted, Global)	Purpose of the communication	Support Documents	Tool	Timing (Phase, ...)	Owner
....

The main components of the communication plan are:

- Stakeholders: Target of the communication
- Communication Type : Targeted or Global

- Purpose of the communication
- Support documents
- Timing: when to do the communication
- Owner: Accountable for the communication

11. L6S applied to Telco: Analyze and Measure phases

The measure phase could be supported by Framework in multiple ways:

- While doing the VSM, eTOM end to end business streams could be used, jointly
- With Business Metrics while computing the process performance data to perform any customization regarding the process metrics definitions.

The analyze phase could be supported by Framework in multiple ways:

- While applying Fishbone technique to support the identification of causes, of non process performance, related to Methods and Inputs, eTOM end to end business streams could be used.
- While Applying 7 Wastes technique, eTOM business streams could be used as well. For example, to identify wastes related to the Waiting Time, we could have one between Order Handling and Service Configuration and Activation due to the non existence of an internal operational level agreement (OLA) between these 2 processes.

The core foundation of FMEA, which is composed of the process steps, is already defined during the Define Phase using the appropriate support documents as previously explained. The output of the FMEA is an action plan for which a steering committee has been defined.

12. L6S applied to Telco: Remaining phases briefly

Regarding the process design, To-Be VSM, To-Be Process Flow and To-Be Procedure was formalized and with a pilot run.

13. L6S applied to Telco: Benefits

The benefits could be seen from three different perspectives:

- Customer Experience
 - **Increase** in % of orders delivered by committed date by 67%
- Operational Efficiency
 - **Decrease** in the Mean Time Order To Activation by 36%
- Revenue & Margin
 - **Increase** of the Revenue Breakdown, by 55%, related to:
 - Customer Segment: B2B
 - Service : Optical Fiber

13. Conclusion

This paper suggests a methodology harmonizing Lean Six Sigma and Framework selected components with a focus on the engineering aspects related to the process. This harmonization, called L6S-Telco, allows quicker Transformation projects and getting standardization benefits since Framework components are used throughout the methodology where applicable as inputs for the design aspects. It does generate Six Sigma benefits as shown in the case study's methodology benefits. L6S-Telco is an approach to address business process transformation for Telco industry and might be applicable to many other service companies since many of the Framework components and Lean Six Sigma are too. The harmonization will optimize the CaPex and eventually OpEx since one single optimized project is executed to address two major needs namely process design and performance.

The current paper could be as input for the coming article (s) to apply L6S-Telco to other end to end business streams related to the customer, Network and Product. It can be also a basis to consider other layers of the enterprise architecture (Information, Application, Technology) to have an end to end business transformation.

Acknowledgments

Special thanks are addressed to my parents, my wife, my daughter and my son for their prayers, smiles, and support.

The authors would like to thank all those who participated in the project, basis of the case study, from MTN Ivory Coast corporate and MTN Business.

I would like to thank in advance anybody for any provided feedback or for any inspiration.

References

- [1] M. Kelly, A. Kawecki, "Business Process Framework (The Business Process Framework), Addendum D: Process Decompositions and Descriptions", TM Forum July 2012
- [2] M. Kelly, D. Freed, "Business Process Framework (The Business Process Framework), Addendum DX: Extended Process Decompositions and Descriptions", TM Forum April 2012
- [3] J. Wilmes, A. Kawecki, " TM Forum Portfolio and Product Management Quick Start Pack ", TM Forum October 2012
- [4] TM Forum, "Business Metrics and Benchmarking Program: Business Performance Management System, Level1 Metrics", TM Forum November 2011
- [5] G. Vitt, M. Kelly, A. Kawecki, " Business Process Framework (The Business Process Framework), Addendum E: Application Note – End-To-End Business Flows", TM Forum April 2011
- [6] G. Vitt, C. Dietze, M. Kelly, A. Kawecki, " Business Process Framework (The Business Process Framework), Addendum J: Application Note – Joining the Business Process Framework through to Process Flows", TM Forum October 2011
- [7] M. Benhima, C. Ameyao, A. Ajaoui, A. Salhi, M. H. Jellouli, S. Garcia, "Transformation Business : Pour une meilleure optimization", TIC Magazine N°2 Janvier – Mars 2012
- [8] M. Benhima, J. Reilly, H. Benhima, "Design of an enhanced Integrated Management System with Customer Experience Focus: The Business Process Framework (also known as eTOM) and ISO9001 together", IJCSI, Vol9, Issue 5, N° 2, Sept 2012
- [9] K. Amin, S. Lynch, C. Michel, E. Obreja, K. Willets, C. Michel, Tribolod, Telecom New Zeland, A. Kawecki, "Product Lifecycle Management Introductory Guide", TM Forum November 2011
- [10] K. Amin, S. Lynch, C. Michel, E. Obreja, K. Willets, C. Michel, Tribolod, Telecom New Zeland, A. Kawecki, "Product Lifecycle Management Introductory Guide", TM Forum November? 2011
- [11] T. McCarty, M. Bremer, L. Daniels, P. Gupta, "Six Sigma Black Belt Handbook", Motorola University, 2004
- [12] C. Frechet, "Mettre en oeuvre le Six Sigma", Eyrolles, 2005

Mounire Benhima is a Senior Consultant, specializing in Business Transformation with its implementation challenges. 15 years of experience in various industrial environments (mainly ICT) in many countries (Africa, America, Europe, Asia). He is distinguished to be the first one in the world to be certified The Business Process Framework Level4 (The highest level of Business Process Framework certification) with the highest score when it was an essay. He is also part of the international TM Forum Trainers Panel (21 members as per August 2012). Mounire has held various key consulting positions and has led numerous groups in major business transformation projects. As a result of his experience and background, Mounire has developed extensive operational and strategic skills in the Enterprise Architecture and Business Transformation with their impact on the organizational structure, quality management, business process engineering, information system governance, and change management.

Abdelaali Himi Abdelaali HIMI is a Senior Consultant and Researcher at the Faculté Science and Technology University Hassan I in Settat. He is an Engineer from ENSIAS since 1996. He has more than 16 years experience. Expert in management information systems and has accumulated many years of experience in project management, Business Process Reengineering, Enterprise Architecture and ERP. He is certified ITIL Intermediate (OSA), Certified ISO27001 Lead Auditor and Lead Implementer and ISO2000 Lead Auditor and Certified Lean Six Sigma. He has published several papers on the management of services and the management of the business value chain.

Camille Ameyao Camille Ameyao is a Senior Manager of MTN Business Service Delivery He is in charge of Pre-sales, implementation and after sales support. He is an active member when introducing new technologies. For Business To Business, he manages Pre-Sales activities, resource management and operations activities, service management and operations activities and Technical support expertise to Business Sales. He is also assigned for special projects as acquisitions. He participated in many seminars delivering high quality speeches about challenges and new trends in the Telco industry.

Edwige Ahonie Adou Edwige Ahonie Adou is Business Analysis and Report Expert within MTN Business and Project Coordinator for many key projects related to MTN Business Business Transformation. For these key positions, she demonstrated high personal and project coordination skills which allowed her to be distinguished and assigned to key projects. She is an efficient communicator. Her main duties are implementing the integrated management systems related to processes, Designing new processes, generating the CxO Balanced Scorecard and ensuring Leadership during Business Transformation projects execution.