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Make or Buy decision making for telcos

Towards a Rational Transaction Cost Economics (TCE) Support System

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***Abstract* — Because of the frequently changing environment and technologies, Telecom operators' value chain faces permanently challenges related to agility and cost effectiveness. Whether to vertically integrate or to delegate to the market is strategic decision making, influenced by a variety of factors. The theory presents rich findings about the most important factors, and we in this article are trying to apply them on the telecom industry while tuning them throughout the tmforum standard, a best known and worldwide accepted framework in the telecom industry. We are then suggesting a basis for identifying which Transaction Cost Economics (TCE) model might support decision makers in their understanding of the emerging behaviors related to the make or buy dilemma; a model that would definitely help them in adopting the best fit of internal and external execution tactics towards a multidimensional effective strategy execution.**

Keywords—Strategic make or buy decisions, Transaction Cost Economics (TCE), value chain, vertical integration, Enhanced Telecom Operations Map (etom).

I. SCOPING THE ISSUE

A. Telcos', from monopolies to oligopolies

Until lately in the 90th, telecom service providers used to be monopolies held and managed by governments (Government Owned Corporations or GOCs); the beginning of the 21th century was characterized by an increasing trend of liberalization of the telecom industry and the role of the state switched from a role of an investor to a role of a regulator and a policy maker. For instance, the ANRT, which is the telecom authority in Morocco, has been created in 1998 after a new license had been released for a second player in the Moroccan telecom market (*Meditel*), opening a new era of a duopoly in the telecom industry in the country. Regulators are neutral government owned entities that assure protection of the industry at large while assuring fair competition among the players.

In such a new era, tuning the cost structure while maintaining innovation becomes a priority for telcos. In this paper, we are trying to decompose the value chain of the telecom providers while categorizing the different transactions at different levels of the organizations. We then apply the Transaction Cost Economics (TCE) theory and other frameworks of the industry in order to understand the make or buy behaviors.

B. The new trends of the telco industry

During the first decade of the 21th century, there was a major trend in the telecom industry of states selling their stocks to private equities. Regulators released more licenses in order to cover the increasing demands of communications, where new technologies, protocols and frameworks have been released. There was also a diversification of the marketing offerings in order to cover value added services, based on broadband wired and wireless internet and the 3G/4G technologies, benefitting from the emergence of smart phones, social networks and social Medias. Consequently, new players entered the market and the ecosystem of service providers knew a first transformation from monopolies/duopolies owned by the state to oligopolies, owned by capital holders, and operating in an almost free market though regulated by the state through regulators. Some exceptions still emerge such as the case of China, which still represents a conservative market managed by the government through the three GOCs: "China Telecom", "China Unicom" and "China Mobile". Another model emerges in the USA which seems to be a kind of cartels. For instance, AT&T and Verizon own each land-based telecom services and each operate discretely in a geographic market, almost like a monopoly. This kind of models promotes advances in the telecom industry by enforcing advanced R&D, better equipment and VAS innovations; even thought, it maintains prices at a disadvantage of the final consumers.

Generally, the new trend of the industry is the entry of more new players in a game already saturated and increasingly characterized by tough competition based on lowering prices and diversifying service offerings. For instance, the number of telecom operators in India reached thirteen for a number of 942.95 Million subscribers, representing a teledensity [1]of 75.8% [2], while in Uganda it

[1] Teledensity : The number of landline, mobile or internet lines in use for every 100 individuals living within an area.

reached eight telecom providers for a number of 19.5 Million subscribers, representing a teledensity of 53% [3], two examples of free markets where regulators play very little authority. The telecom industry is very sensitive to competition and once a new player enters the market it becomes difficult to avoid "price wars" among the competitors. Regulators generally block formation of cartels and their main role is to protect the industry and the consumers. We have witnessed an example of a price war in the Ugandan telecom market, when in 2009, at the entry of the fourth service provider (*Orange*); prices went critically down to the point that pushed Orange to sell all its shares to Africell in 2014. Currently, the Ugandan telecom industry is suffering from an unbalanced market of 7 telecom operator for a population of about 36.5 Million ([18], [19]).

C. What to make and what to purchase ?

The goal of identifying the "what" in the "Make or buy" decision dilemma is a key element in identifying any behavioral model. We mean by the "what" the scope that defines what the potential economic transactions are. In general, the scope that defines what to make and what to purchase can be summarized as follows:

- An organizational unit: A company might outsource an organizational unit. We have witnessed telecom providers outsourcing their IT department such as "Free" in France, or their call centers such as "inwi" in Morocco.
- Interim, consulting or training services: A company might delegate some specific needs to a third party that has a certain expertise, or it might fulfill the needs internally. We have witnessed, as an example, companies encouraging employees to deliver trainings for their colleagues (Case of a "Make") rather than to call for a training/consulting company! (Case of a "Buy")
- Products/Services that support the business: A company might purchase or acquire a product, such as a COTS software (Commercial Off The Shelf), or it might decide to develop it internally.

Each decision has its advantages and disadvantages and a variety of factors influence the decision to make internally or to go to the market. For instance, developing software internally allows ability and flexibility to customize features at a cost advantage.

II. VERTICAL INTEGRATION, TCE AND MAKE OR BUY MODEL

A. Transaction Cost Economics (TCE) and the theory

Nexus-of-contracts metaphor describes the firm as a complex central entity that manages a relationship among many parties by using legal contracts, in order to provide value for customers. A transaction cost is a cost incurred when performing an economic exchange, whether internal to the company or external towards the market. TCE is a unit of analysis that helps firms to decide whether to make, buy or ally. Generally, opportunism drives companies in this quest based on their self-interest and on the bounded rationality of their decision makers.

Coase [4] concluded that there must be costs to using the market that can be eliminated by using the firm; he explained that transaction costs include expenses engendered when negotiating, writing and enforcing contracts; it also includes costs related to adverse consequences of opportunism.

Transaction costs are linked either to motivation or to coordination (Milgrom and Roberts [5]). The "Motivation cost" relates to the internal flows; those are mainly related to the cost of managing and motivating human resources. Williamson [6] stated that "Motivation cost" relate to opportunism while Jensen and Meckling [7] argue that they also relate to "Agency cost".

Coordination costs concern both internal and external flows, and they include costs related to the search of an adequate supplier (Stigler [8]), costs of coordinating the inputs (Alchian and Demsetz [9]), and measurement costs (Barzel [10]). Practically, there is a governance structure in which "the integrity of a transaction or a set of transactions is decided" (Williamson [11]). The governance in this context consists of formal and informal structures and rules that enable deciding, managing and following up economic transactions in an economic manner (Wieland [12]). The basic argument of TCE is that decision makers will choose whichever governance structure minimizes the total cost associated with a transaction (Coase [4]).

Williamson [13] presents three characteristics of the TCE. The first is asset specificity, representing the extent at which the investment is specific to the transaction. This is somehow linked to opportunism and rationality. With higher levels of asset specificity, a firm will prefer to internally organize production rather than delegate to the market. The second characteristic is uncertainty; companies actually tend to produce internally in cases where the level of uncertainty is high. The third characteristic is the frequency of the transaction; generally, firms tend to internalize production when transaction frequency is important.

TABLE I bellow presents the different theories with a summary of the basic criteria for a "Make" choice. In the table, we convene the decision to make as a reference. In a nutshell, the set of criteria that pushes decision makers to "Make" rather than to buy can be summarized as follows:

- When the transaction is highly specific to the company and when it is highly difficult to be duplicated,
- When uncertainty and market risks are high, this includes political instability, geographical disadvantages, the level of competition, etc.
- When the transaction's frequency is not high,
- When the cost of using the market is high,
- When agency costs are low; this includes low governance complexity, non-complicated internal flows and low motivation costs related to HR management.

TABLE I SUMMARY OF THE DIFFERENT TCE THEORIES

Theory	**Driver of making rather than buying**
Williamson [11]	• Asset specificity (**High**) • Uncertainty (**High**) • Frequency of transactions (**High**)
Coase [4]	• Significant cost using the market, such as negotiating, contracting, etc. (**High**)
Milgrom and Roberts [5] Williamson [6] Jensen and Meckling [7]	• Motivation costs, such as agency costs, opportunism, etc. (**Low**)
Coase [4] Stigler [8] Alchian and Demsetz [9] Barzel [10] Williamson [11]	• Internal / external flows (**Low if internal flows is complicated**) • Governance structure that minimizes the total cost associated with a transaction (**Low if governance is complicated**)

B. Vertical boundaries of the firm/vertical chain

Generally, managers prefer to buy rather than to make whenever possible, as for them, it's better to focus on the core business of the organization while delegating the maximum risk and agency efforts to the market. Agency efficiency is a serious concern for senior executives, and it somehow explains this behavior. In fact, purchasing rather than making allows avoiding the three means of combating agency problems specified by Besanko *et al* [14] which are monitoring, incentives and bureaucracy. "Monitoring" is about using control measures such as the use of access monitoring and controlling systems. Performance based incentives is about using reward systems. Bureaucracy helps in the control and distribution of the incentives following pre-established rules of performance and accomplishments.

There are two factors that influence the hypothesis of purchasing appetite:

- Firstly, if the organization is vertically integrated, the rest of the hierarchy generally follows and the make behavior emerges at every level of the organization.
- Secondly, opportunism or what we call "moral hazard", which might influence the make or buy behavior. In fact, the "make" decisions generally call for more responsibility and therefore better opportunities for internal promotions; while the "buy" might open doors for corrupted decision making. The choice in this case is therefore linked to specific circumstances and is consequently unpredictable.

III. THE TELCO VALUE CHAIN AND SCOPE OF TELCOS

A. The telcom providers' value chain

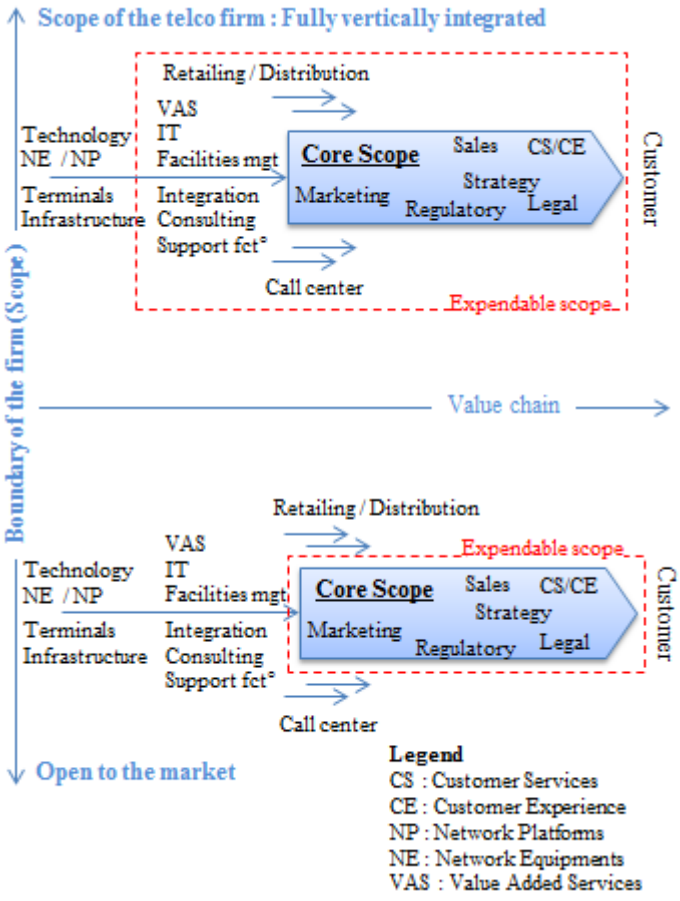
Activities within a telecom provider are much diversified and the telco value chain seems to be complicated. Yet a unique scope of the firm does not exist and decision making throughout the vertical chain is influenced by so many factors. Opportunistic behaviors drive the quest of the make or buy decision making, based on a variety of factors. Part of our research is to identify towards which model this opportunism converges so that we clarify the Transaction Cost Economics (TCE) trends of telecom providers.

Fig.1 presents, for a telecom service provider, what we identified as a typical value chain (Horizontal axis), and the scope and boundaries of the firm (Vertical axis). The figure dresses a first hypothesis about the blocks of the value chain that might be purchased or made. Three types of information are shown in this figure. The first is what we called the "Core scope", which represents the core business of the company that is not a subject to a "make or buy" decision making. The second are things that would be certainly purchased, such as the purchase of mobile phones through partnerships with mobile vendors, the purchase of infrastructure equipment such as servers, satellites, 3G/G4 core networks, etc. or the purchase of technology, such as ERPs and software. The third and most important part in the figure is what we called the "Extendable scope", mentioned in red in the figure. This actually shows blocks that would be subject to a "make or buy" decision making. For instance, a telecom company might design and manage its content management system value added service (VAS), or it might call for a specialized third party. The extent of delegation to the market is also a consideration that is linked to each specific transaction. Applying this to the Content management systems' example, we have the following three types of transactions (or TCE):

- Infrastructure transaction: Generally delegated, with a significant trend of cloud Computing.
- Software transaction: Generally delegated, with possibility of using SaaS (Software As A Service) in order to gain on agility and cost. This is the case of Telefonica for example [15]
- Integration transaction: Generally delegated, but can be made internally.

The TCE configuration is specific to each company and to the circumstances of the transaction. We have witnessed a telecom provider (*Orange Madagascar*) who developed his CRM ERP internally; a fact that seems intriguing to another telecom operator in another country. This actually depends on the boundaries of the firm and its vertical integration characteristics.

Fig.1. Scoping service provider's value chain (Overview)



B. Which organizational structure for a TCE identification ?

During our research quest around the different telecom industry frameworks, on which we focused on enterprise architectures and business processes, we identified the "tele management forum" framework called Frameworx (www.tmforum.org) as a good reliable basis that provides many important concepts related to the organizational structures and operations of a telecom provider. This was very helpful in scoping and categorizing the different transactions for a possible TCE model.

This framework is nowadays emerging as an industry standard, worldwide recognized by every company operating in the telecom industry. Tmforum is a consortium of a wide number of telecom providers. The mission of the group is to gather the best practices in the industry and to organize them into a set of standards. We based our analysis on the 14.0 release; however the latest version is the 14.5 that has been released in Dec 2014.

Vendors have also adopted the tmforum framework as a standard in defining the scope of their products as well as the interfaces and APIs around their solutions. This gave them the ability to speak the same language with their potential customers and their partners in the industry. In terms of architecture design, the tmforum framework allows integration among different solutions belonging to different vendors by fostering loose coupling among the different enterprise architectural building blocks ABB and solutions building blocks SBB.

The standard is composed of the following frameworks:

- eTOM [2] for Business processes,
- SID [3] for data structures,
- TAM [4] for applications and architectures,
- The Integration Framework.

In terms of enterprise architectures, the four standards provide answers to the following :

- The What : This is provided by both, SID and TAM
- The How : This is provided by the eTOM framework

The integration framework from its side provides a way to integrate the different building blocks for the sake of a coherent and integrated architecture. Other considerations of an enterprise architecture, such as the Who (Responsibilities) or the Why (Mission and objectives), are not covered by any of the listed tmforum frameworks, though other frameworks cover them such as Zachman and TOGAF.

C. Main sources of transactions for telcos

It is important to identify the types of functions and structures and how they relate to the make or buy behavior. The purpose of that is to find out how the decision making process is influenced by a given function of the enterprise and therefore to identify any behavioral trends related to the organizational structure. Generally, three main organizational and functional blocks emerge:

- Business functions, which are the enterprise entities that directly generate revenue by developing and promoting the portfolio of products and services, such as marketing, sales, communication and advertising, etc.
- Support functions, which are the functions that support the business, such as IT, Supply chain management, Customer services management, etc.
- Enterprise/Corporate management functions, which are the entities that support managerially the business, such as HR, strategic planning, business development, financial management, regulatory management, etc.

Overly, a key criteria influencing the decision making is how far the function is linked to the core value proposition, directly or indirectly. Obviously, the core functions are about entities that create a competitive advantage for the company, such as functions that possess precious information to be protected. The TCE of the "Support Functions" are more likely to be oriented to the market; support functions are meant to support the business without being involved directly into critical aspects of the business, such as IT. The "Business Functions" cover entities that create the customer value for the enterprise or those that have the most important and direct impact on the customer. Generally, those functions are all part of the value chain of the company that support the Time To Market. The "Enterprise Management" Functions are critical to the business as they provide the required capabilities that sustain good standing operations in alignment with regulations and

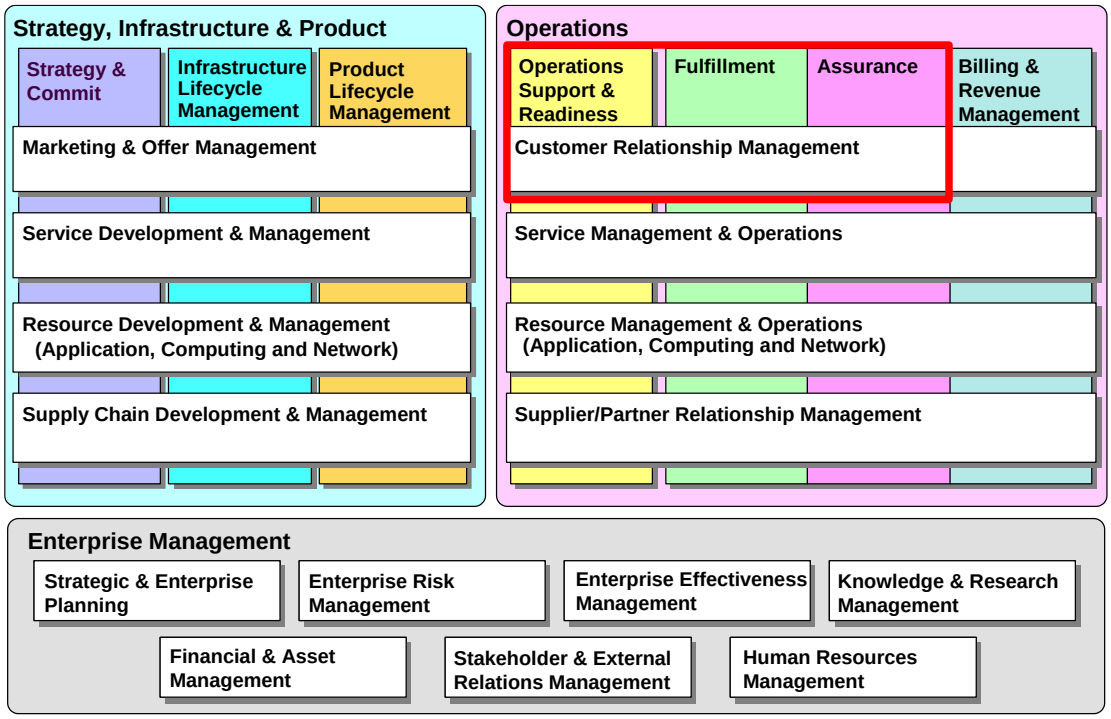
[2] eTOM : Enhanced Telecom Operations Map
[3] SID : Shared Information Data
[4] TAM : Teleforum Applications Map

market constraints. Both Business Functions and Enterprise Functions are considered core components of a telecom organization and they therefore tend to be vertically integrated, fostering consequently the make behavior.

There is yet an intrinsic relation between the type of a function and the make or buy behavior. We therefore made the hypothesis of a possible mapping of the decision making behaviors to the eTOM framework, which in turn helps in identifying potential sources of transactions for our TCE model. In their publication on how to apply the eTOM to build an organizational structure for telcos, the tmforum [16] argues that « a company may look to map the Business Process Framework into its business and may therefore want to identify departmental roles and boundaries using the Business Process Framework as a tool in this ». This is important as it allows mapping a business process to an organizational structure; which somehow represents a smooth transition from the "what" (The structure perspective) to the "How" (The business process perspective). This mapping had been applied and approved by many telecom operators and it seems working well in scoping the organization and the business.

In our research, we used this "Mapping" to come up with a TCE model for telcos; therefore, we will not look at eTOM as a tool for identifying business processes per se, neither as a basis for structuring the business; our quest is actually to track the adequate level of detail within the hierarchy that would allow a good grouping of the organizational units, representing the business units and departmental structures, that helps identifying sources of TCEs. In the real world of telcos, each organization adopts its own level of detail towards a significant organizational scope; this in fact depends on the size of the company, the segments it serves, and definitely its deployed resources. The experience shows that each structure converges towards a given level of the eTOM framework, which in fact represents the desired significant organization and business scope for the company. Fig.2 shows the depth level 1 of the eTOM framework with an example of mapping the function of the "Service desk" at its highest level, an activity that a company might outsource to a third party (Buy) or operate internally (Make)

Fig.2. Level 1 eTOM framework with an example of mapping with the helpdesk function



The eTOM framework is organized through five hierarchical levels; each level covers a certain functional or business block with a given level of detail that defines the scope of the organization. It is important to note that the eTOM Framework doesn't give detailed description of business processes, but eTOM Framework. It shows how a business process is presented. What is important in this figure is to show that the framework gives a general description about a process. Each business process is given the following description :

- Category : This gives the category of the business process with indication of the addressed maturity level,

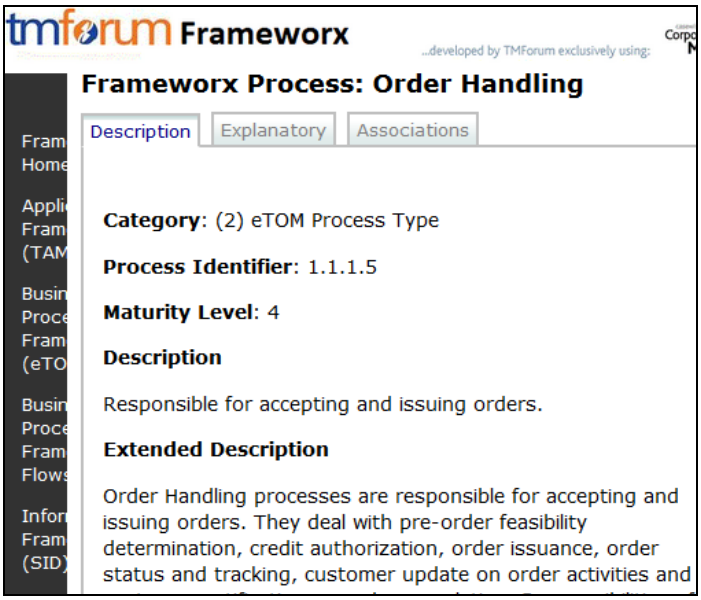
instead it gives the scope that must be covered with an overall description. The detail of each business process is let to each organization as this might represents a core competitive advantage that cannot be duplicated for other organizations. Fig.3 shows a snapshot of the web-based document of the

- Process Identifier : This gives the process unique identifier,
- Maturity level : This gives the maturity level of the process, in this case we stop at the level 2 maturity,
- Description : This gives a general description of the business process,

- Explanatory : This gives further description of the business process,
- Associations : This gives the links between the current business process and other business processes, or what is known as “Intersections”.

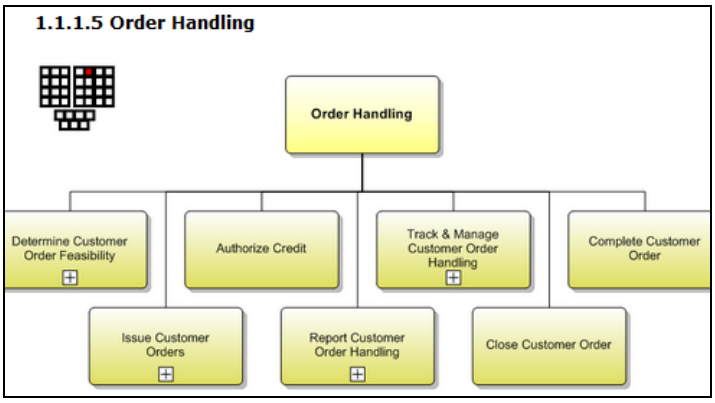
The same pattern of presentation is applied to all the other business processes of the eTOM model.

Fig.3. eTOM – Description of a frameworx business process, case of Order Handling



For instance, the process “Order Handling”, with the identifier 1.1.1.**5**, is a level 2 process that belongs to the “Customer Relationship Management” building block, with the identifier 1.1.1 shown in red in Fig.2. the number 5 in the identifier represents the position that takes the sub process within the hierarchy, and meaning the fifth leaf. The framework then recommends having an “Order Handling” building block for the Customer Relation Management function, meaning **“The what”;** how this should be done is specific to each organization, and this is the “**The How” implementation**. Going a step forward to the level 3 will decompose this block to more detailed building blocks such as “Determine Customer Order Feasibility” process, “Issue Customer Order” process, “Authorize Credit” process, etc. exactly as shown in Fig.4

Fig.4. eTOM decomposition of the Order Handling process until the third maturity level



It is important at this stage to map each process to the likelihood of the making or buying decision making. Since the framework is organized in a hierarchy structure, we have begun with the first level of the eTOM framework, the same logic might be applied to the other levels. TABLE II shows the links established with the type of functions in the organization while resolving the likelihood of making or buying for that level of detail. In order to fill in the “Likely to buy” column, we have considered the different theories presented earlier in this article married with our experience on the field.

The findings are interesting as we noticed that we converge towards the hypothesis already made about the type of functions; meaning an emerging behavior of buying in the case of noncore business activities, such as the support functions of the organization. An emerging behavior of making is instead linked to the core business activities as well as the business and corporate functions. However, going a step further to a more detailed level, meaning the levels 2, 3, 4 and 5, would diverge this decision making model and the pattern is getting more difficult to predict, needing more factors to be considered.

TABLE II Make or buy behaviors applied on level 1

Level 1 eTOM	**Type of function**	**Likely to make**
Enterprise Management	Core Business	Yes
Market, Product, & Customer	Core Business	Yes
Operations	Support	No
Resource	Support	No
Service	Support	No
Strategy, Infrastructure & Product	Core Business	Yes
Supplier/ Partner	Support	Yes

In all cases, this logic gives an insight about a further TCE model by going forward and down inside the hierarchy levels of

the framework. The unpredictable part of the model can be avoided by adopting a scientific model based on a profit & loss (P&L) assessment which is in turn based on a set of parameters specific to each decision maker. Based on this assumption, the analysis goes then narrower from level 1 to level 5, giving more specific and detailed insights for a clearer behavior about the "make or buy" decision making.

From another perspective, it is widely known that going for implementing a level of the business processes is a measure of maturity for the telco organizations. For instance, formalizing the business processes at the fourth or fifth level means that the company is highly mature in terms of organization, structure and business processes. This latter is generally what count most for a telecom organization and it represents its competitive advantage. TABLE III gives an insight about how the eTOM hierarchy looks like throughout its five maturity levels, we have chosen some samples from the "Operations" building block that goes from level 1 to level 5. The first column is mapped to the pink block in Fig.2. Obviously the same analysis might be applied to the other high level blocks such as "Resources", "Services" and so on.

TABLE III ETOM FROM LEVEL 1 TO LEVEL 5 (A SAMPLE)

Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**
Operations	Customer Relationship Management	CRM - Support & Readiness	Support Customer Interface Management	Ensure Customer Interface Capability
				Undertake Customer Contacts Trend Analysis
			Support Order Handling	Roll-out Order Handling Infrastructure
				Ensure Order Handling Capability
				Forecast Order Handling Requirements
				…
			Support Selling	Ensure Selling Capability
				Manage Sales Channels
				Manage Sales Leads
				Undertake Selling Trend Analysis
…	…	…	…	…

For instance, although the likelihood of the "Operations" building block is to "buy" (TABLE II), going narrower in the hierarchy gives possibilities for better tuned decision making for each building block of a narrower level. We have applied this same principle to every building block within the framework, from level 1 to level 5. The number of the studied decisions is 1391, covering every possible type of TCE for a telecom organization. This actually forms the basics of our "Transaction Cost Economics Support System" that must be tuned according to the parameters that we have identified from the different theories (TABLE I). Based on the same principle described in Table II and Table III, we test the suggested decision making support system model against another domain, this time "Resources". Due to the complexity of each domain and because of the impracticability to cover all the maturity levels in this document, we will stop until the maturity level 3 of eTOM, on which we apply a decision choice for the case of a telecom service provider open to the market. The decision might differ in cases the company is more vertically integrated.

TABLE IV DECISION MAKING SUPPORT SYSTEM APPLIED ON "RESOURCES" DOMAIN

Maturity level 1 process	**Maturity level 2 process**	**Maturity level 3 process**	**Make / Buy?**
Resource	Resource Development & Management	Resource Strategy & Planning	Make
		Resource Capability Delivery	Buy
		Resource Development & Retirement	Buy
	Resource Management & Operations	RM&O Support & Readiness	Buy
		Resource Provisioning	Buy
		Resource Trouble Management	Buy
		Resource Performance Management	Buy
		Resource Data Collection & Distribution	Buy
		Resource Mediation & Reporting	Buy
		Workforce Management	Make

In order to show how the model might be adapted in case we go narrower in the hierarchy, we will try to zoom into the fifth level for one branch, the one highlighted in red in TABLE IV. We note that the colour code adopted is : Green for a "Make" decision and orange for a "Buy" decision.

TABLE V ZOOM UNTIL LEVEL 5 OF THE HIERARCHY MODEL OF ETOM (SAMPLE)

TCE deduced from eTOM business process model	Make/Buy
-Resource (Level 1)	
+-- Resource Development & Management (Level 2)	
+--- Resource Capability Delivery (Level 3)	
+---- Map & Analyze Resource Requirements (Level 4)	
Capture Resource Demand & Performance Requirements	Buy
Agree Resource Infrastructure Requirements	Make
+---- Enable Resource Support & Operations	
Design Resource Operational Support Process Improvements	Buy
Identify Resource Support Groups, Skills & Training	Make
Identify Resource Support Requirements	Make
+---- Capture Resource Capability Shortfalls	
Capture Resource Capacity Shortfalls	Buy
Capture Resource Performance Shortfalls	Buy
Capture Resource Operational Support Shorfalls	Buy
+---- Manage Resource Capability Delivery	
Co-ordinate Resource Capability Delivery	Make
Ensure Resource Capability Quality	Make
Manage Commissioning of New Resource Infrastructure	Make
Establish Resource Capability Sourcing	Make
+---- Gain Resource Capability Investment Approval	
Develop Resource Capability Investment Proposals	Buy
Approve Resource Capability Investment	Make
+---- Manage Handover to Resource Operations	
Co-ordinate Resource Operational Handover	Buy
Validate Resource Infrastructure Design	Make
Ensure Resource Handover Support	Buy
+---- Design Resource Capabilities	
Define Resource Capability Requirements	Buy
Specify Resource Capability Infrastructure	Buy
Select Resource Capability Suppliers/Partners	Make

Table IV and table V explain the basics of the suggested model on which we might apply the “make” or “buy” decision making. This actually gives an important input for a parametric hierarchy model, where a decision maker could list the transactions taken from the eTOM model, which is somehow transforming the “HOW” into the “WHAT” such as described before, at an adequate level of maturity of the organization, which should obviously be tuned to each organization, and then applying the desired “Make” or “Buy” decision choice for each transaction. From an “Enterprise Architecture” perspective, the “HOW” and the “WHAT” are the basic two components of an enterprise architecture at large, where the “HOW” is representing the business process part, considered also as the differentiator of the organization or its competitive advantage, and the “WHAT” which is representing the set of functions within the organization or what is known as architectural building blocks. In the suggested model, the “WHAT” represents a TCE or a transaction, which somehow reflect a narrower component, or a subset, of the notion of a building block.

The eTOM maturity level gives an insight about a given telco organization. If we compare Orange, which is a big multinational company, having subsidiaries all over the world and serving a global market, with Djezy in Algeria or inwi in Morocco, which are both local companies serving a local or regional medium market, we notice the importance of formalizing business processes as part of building internal capabilities in order to deliver the promised value for a given customer basis. Biggest telco companies are actually implementing advanced level of the eTOM framework as part of aligning operations to the best in class standards. Alignment covers the holding company as well as subsidiaries, in a quest of gaining in economies of scale and scope, lowering operational cost and gaining in cumulative and scalable knowledge, a fact that creates considerable competitive advantage for companies serving global markets. Implementing an advanced maturity level of the framework allows therefore covering all the required operations to efficiently serve the potential markets while complying with regulatory rules and constraints. The insights delivered by the eTOM framework go in line with the following factors:

- The size of the company : this might relate to the market positioning, the customer base network coverage and number of employees,
- Its scope : This might concern either the geographic coverage (national, regional or global), or it might concerns which type of technology is delivered, such as fixed landlines, mobile, internet services, etc.
- Its serving market segments, such as serving B2C market, B2B market or both,
- Its resources and capabilities: Those are the pillars based on which the business processes are supposed to deliver.
- Etc.

All in all, the findings confirm the hypothesis made that links the type of the function, either it is a “Support function”, a “Core business function” or a “Corporate function” to the “Make or Buy” behavior model. Actually, the functions considered as “Support” are more likely to be outsourced or purchased, reflecting consequently a behavior of “Buying”; where the functions considered as “Core business” are more likely to be kept internally, reflecting a conservative behaviour of “Making”.

Before proceeding to this piece of research, we had a serious concern about the availability of a reliable standard that would allow scoping the issue. Telecom operators are complex organizations where many dimensions intersect to deliver the desired value for the final customers. Bounded rationality of top managers is due to this complexity as well as to the complexity of the served markets with all the regulatory and environmental constraints. Therefore, the majority of executives base their “make vs buy” decision making on their own intuition. From our experience, we notice that in practice, it is generally a one dimension decision making approach based on considerations between cost governance and revenue generation. The analysed theories were helpful in adding other dimensions than cost or revenue. Furthermore, using the eTOM framework was helpful in finding the good scope to be addressed; we have used all its building blocks to come up with a rational basis for a Transaction Cost Economics model that would support decision making on what to make and what to purchase. The suggested model seems to be a rational model, based on the fact that each business process generates a set of transactions, obviously at a certain level of maturity.

It is possible to automate the suggested model in order to allow more flexibility for decision makers to go forward and backward the hierarchical framework, looking for the adequate level of detail, in order to tune the decision making scope. The model actually adds some rationality at its finest end by going until the level of transaction. The identified factors from the different previous theories (TABLE I) are yet influencing the suggested model; even though, they form part of the rationale behind a decision on a given transaction. Automating the model must definitely take this in consideration, based on an Analytic Hierarchy Process Methodology. Overly, the suggested model, which is based on a reliable standard of the telecom industry, forms an important basis towards a “Rational Transaction Cost Economics Support System” for telecom operators.

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