

Limbach, Felix

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Cooperative service provisioning with OTT players – An explorative analysis of telecommunication business models

Felix Limbach (TU Berlin, Straße des 17. Juni 135, 10623 Berlin, Germany)
Firstname.lastname@tu-berlin.de

Abstract

The contribution of this paper is manifold. First, it provides a cooperation taxonomy for partnerships between telecommunication operators and Over-The-Top service providers. Second, it explores the impact of cooperative service provisioning on the telecommunication operator's business model. As a result of a literature review seven types of service cooperation are identified. A business model ontology is used to assess value creation activities, customer relations and financial aspects for three generic value creation patterns. Results indicate that cooperation facilitates innovation, quality, service differentiation and tailored customer services.

Introduction

Market-driven provisioning of next-generation access infrastructures requires operators to carefully balance broadband supply and demand. Once investments in new infrastructure have been made, take-up rate and Average Revenue per User (ARPU) maximization are core activities to recover investments. In competitive markets provisioning of attractive customer services is the most important approach to reach these goals. Thus, after telecommunication market liberalization major operators have diversified their activities into related businesses to provide a broad variety of content to customers (Ulset, 2007). However, many telecommunication operators are struggling to provide value-added services and content that can compete with market offers of leading service providers such as Google, Facebook or Amazon (Grove and Baumann, 2012). Thus, industry-wide diversification attempts of operators into content provisioning have in many cases been followed by a consolidation and restructuring phase (Ulset, 2007). As an economic consequence collaboration of independent and highly specialized companies is moving in the focus of telecommunication companies.

On the technical side inter-industry value creation is facilitated by the fact that telecommunication operators are moving legacy infrastructure to all-IP platforms. This development can foster drastically decreased coordination and transaction costs and enables new customer value propositions (Osterwalder, 2004). Moreover, it has been recognized to result in complex competitive and cooperative dynamics (Li and Whalley, 2002). Both dynamics can be observed between operators and internet content providers that offer their services to internet users without direct control of telecommunication operators (Aidi et al., 2012). Subsequently, those internet service providers are denoted as Over-The-Top (OTT) players.

Researchers have started to selectively explore the effects of cooperative service provisioning between telecommunication operators and OTT players (cf. Aidi et al., 2012; Bertin et al., 2011). However, previous efforts have not evolved a systematic assessment of different types of cooperation. This paper aims to fill this gap and explores the effects of cooperative service provisioning on the business model of telecommunication operators. In this paper the following research questions will be explored:

Which types of cooperation can be observed between OTT players and telecommunication operators?

To what extent do cooperative value creation patterns contribute to novel customer value propositions?

How does cooperative service providing impact the operator's contact with customers and its financial situation?

The proposed questions will be addressed as follows. The next section will introduce the theoretical background on telecommunication operator and OTT player interaction. Moreover, central concepts will be defined. Thereafter, the research methodology will be presented. The subsequent section explores different types of cooperative service provisioning and deduces the service cooperation taxonomy. Next, identified cooperation types will be related to value creation patterns. Thereafter, the article will explore the impact of cooperation on the financial and customer dimension of the operator's business model. Finally, a summary and conclusion will be provided.

Theoretical background

According to Murri (2013) five generic telecommunication operator strategies can be distinguished in dealing with OTT players. They are denoted as aggressive, opportunistic, competitive, reactive and collaborative (Murri, 2013). Aggressive strategies include technological blocking of OTT communication services such as Skype or distribution of ad blockers which target the main revenue source of OTT players (cf. Murri, 2013). Similarly, opportunistic approaches aim to reserve the usability of particular OTT services for customers in operator premium tariffs. However, as noted in Krämer et al. (2013) these strategies are anecdotal, as they are very likely to have a negative impact on the operator's reputation.

Competition strategies aim to replicate and advance the functionalities of popular OTT services on the basis of operator assets. Examples include the cross-operator messaging platform Joyn and content that is provided by the operator (GSMA, 2014). However, many operators experience difficulties to keep up with innovation speed and cost structures of OTT players (Grove and Baumann, 2012). Consequently, many efforts have been directed at reactive cost reduction strategies in operator networks. Examples include transparent caching and cooperation with content-delivery-networks (CDN) (Akamai, 2013).

Collaborative approaches aim at cooperative customer value creation and mutual economic benefit for OTT players and telecommunication operators. Surveys and exemplary examples

indicate the topicality of this strategy (Aidi et al., 2012; Hibberd, 2014). Yet, a holistic assessment of cooperative service provisioning and its impact on the operator business model has not been conducted. To address this research gap it is necessary to define the concepts cooperation and business model.

Cooperation is a medium or long-term collaboration of economically independent organizations (Picot et al., 2003). It is voluntary and can generally be canceled by both companies at any time (Gerpott, 2005). Thus, mergers and acquisitions are outside the scope of the subsequent assessment.

Timmers (1998) describes a business model as:

“An architecture for the product, service and information flow, including a description of various business actors and their roles and a description of the potential benefits for the various business actors and a description of the sources of revenues.”

With the rise of e-businesses and e-commerce academic research has developed a continuously growing interest to assess existing business model characteristics and propose future business models (Osterwalder, 2004). Starting in 1998 several widely recognized business model framework papers have been published (cf. Amit and Zott, 2001; Timmers, 1998; Venkatraman and Henderson, 1998; Wirtz, 2001). Though all frameworks have advanced academic literature in the following years Alexander Osterwalder recognized the need for a new business model ontology which to some extent unites previous frameworks and provides a more holistic view of business model components and their interrelations (Wulf et al., 2010). The newly developed business model ontology has soon been adopted by many other researchers (cf. Bask et al., 2010; George and Bock, 2011; Pousttchi et al., 2009; Rohrbeck et al., 2013; Wulf et al., 2010). Moreover, it has been used to assess the business models in the telecommunications industry (Camponovo and Pigneur, 2003; Pousttchi et al., 2009). Camponovo and Pigneur (2003) find that business model research in the telecommunications industry is often limited to an assessment of the operator's infrastructure. They conclude their research with the finding that the Osterwalder business model ontology is particularly suited for a holistic assessment of telecommunications business models. For this reason the ontology will be used to guide the analysis of this paper. The subsequent section will introduce the business model ontology and the conducted research approach.

Research methodology

Osterwalder's business model ontology consists of four pillars: *Infrastructure management*, *customer interface*, *financial aspects* and *product value proposition*. Each pillar exhibits one to three business model buildings blocks which are defined in Figure 1.

Pillar	Business Model Building Block	Description
Product	Value Proposition	Gives an overall view of a company's bundle of products and services.
Customer Interface	Target Customer	Describes the segments of customers a company wants to offer value to.
	Distribution Channel	Describes the various means of the company to get in touch with its customers.
	Relationship	Explains the kind of links a company establishes between itself and its different customer segments.
Infrastructure Management	Value Configuration	Describes the arrangement of activities and resources.
	Core Competency	Outlines the competencies necessary to execute the company's business model.
	Partner Network	Portrays the network of cooperative agreements with other companies necessary to efficiently offer and commercialize value.
Financial Aspects	Cost Structure	Sums up the monetary consequences of the means employed in the business model
	Revenue Model	Describes the way a company makes money through a variety of revenue flows.

Figure 1. Nine building blocks of the Osterwalder business model Ontology (Osterwalder et al., 2005)

The assessment of cooperative service provisioning is closely related with the Infrastructure Management pillar of the employed ontology. This pillar assesses how a company creates value for its customers based on capabilities and resources which may be in possession of a firm or their partners (cf. Osterwalder, 2004). Based on a preceding paper version of Wallin (2005) Osterwalder defines a capability as the skill to carry out repeatable patterns of action. Involved actors such as the partner and the firm need to reach an agreement that specifies the conditions of the partnership and provides mutual benefit. These interrelationships are depicted in a schematic representation of the Infrastructure Management pillar which is provided in Figure 2.

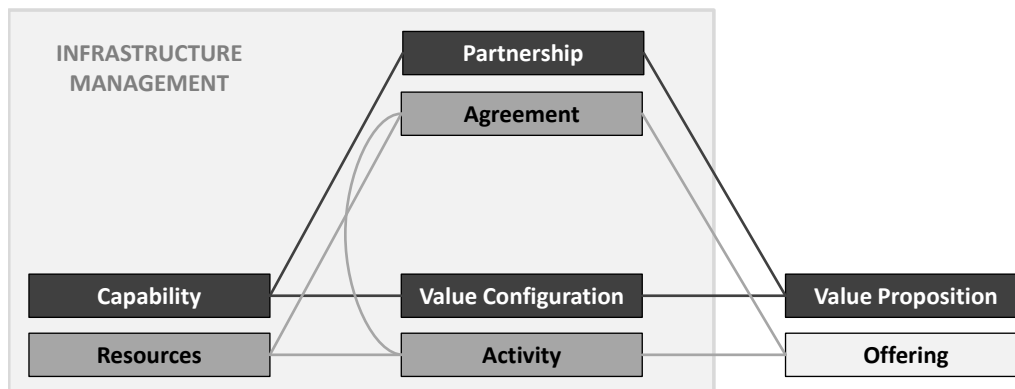


Figure 2. Infrastructure dimension of the Osterwalder business model Ontology (Osterwalder, 2004)

The paper employs a multi-step approach to address the proposed research questions.

First a literature and internet analysis is conducted in order to identify examples for cooperative service provisioning. This analysis includes detailed assessments of more than 100 expert internet blogs, operator and OTT websites. With an inductive approach the identified examples are documented and classified to evolve a service cooperation taxonomy.

In a second step, the impact of cooperation on the Infrastructure Management pillar of the business ontology is assessed. That is, different patterns of cooperative value creation are explored and summarized.

The third analysis step explores the impact of cooperation on the remaining ontology pillars: Customer Interface and Financial Aspects.

In the next section, the results of the literature analysis will be presented.

Service cooperation taxonomy

Two practitioner studies have explored strategic relationships between operators and OTT players (Hibberd, 2014; Murri, 2013). Both provide evidence that operators show increasing interest in cooperative value creation. The anecdotal evidence of these studies serves as a starting point for the subsequent holistic analysis. A summary of the cooperation taxonomy is provided in Table 1.

Promotion cooperation is characterized by two or more partners that create a joint value proposition for the customer. Market goals and products of the partners are complementary to each other and aim to amplify the customer's awareness for the benefits that can be derived from the complementarities (Bucklin and Sengupta, 1993). Usually, an operator is selling a certain part of its service portfolio in combination with an OTT service. One of the least complex occurrences of this cooperation type is given if an operator combines a redeemable voucher for an OTT service with its own service. An example would be an offer called „gamers choice” which combines a high-speed internet access with a voucher for a one-year Microsoft Xbox Gold membership (cf. Vodafone NZ, 2014).

Bundling cooperation refers to a configuration of complementary operator and OTT services that are offered in a specially priced package (cf. Venkatesh and Mahajan, 2009). Bundling can decrease the customer's transaction costs and increase profits if customer valuations for different products are negatively correlated or a large number of customers need to be addressed with one price (Bakos and Brynjolfsson, 1999). For this type of cooperation partners need to agree on an allocation of costs associated with the price discount. Usually, a local operator grants an OTT access to its existing and potential customer base and charges the bundled service package to the customer's bill (cf. Telefonica, 2014; Yourfone, 2014).

In a *Special OTT data tariff* an operator desists from uniform pricing for data-usage. Instead several tariff models, which are common for charging short messages or telephony minutes, are applied to price the OTT service. Examples include fixed monthly fees or so-called fixed up to (FUT) plans which include a certain contingent of data usage for a fixed price (Masuda and Whang, 2006). Simple data tariffs charge a monthly fee for free OTT service usage without further delimitations (Telekom, 2014a). In a special form of tariff customer data usage costs may be sponsored by the content owner (AT&T, 2014a). More complex tariffs bundle OTT service usage with particular operator technologies or include free roaming options (Ovum, 2012). The most complex variant of an OTT data tariff may require special customer infrastructure such as special sim-card to price service transactions instead of data usage (E-Plus, 2014; Ovum, 2012).

Leveraging the *Access to customer data* has been identified as a source of new business opportunities for the digital economy (World Economic Forum, 2013). In general customer data can be classified into volunteered, observed and inferred data (World Economic Forum, 2012). With respect to the first data type customers could object to the use of their data for a particular purpose but choose not to use this right. Online social networks are major source of volunteered personal data (cf. Acquisti and Gross, 2006). Observed customers data is required for providing business functionality or service to a customer. Examples include the customer location, billing information or customer device properties. Inferred data can be derived from volunteered and observed data if the data is aggregated or joined with further data sources. Examples include credit worthiness, traffic information and detailed customer group segmentation. It has been shown that video advertising revenues of OTT players can increase dramatically if operators provide the observed customer location (Telco 2.0, 2008). Other examples aim to decrease the customer's purchase transaction efforts by automatically providing registration and shopping form information from the operator's database (Orange, 2013).

Access to core services denotes operators' endeavor to provide internal infrastructure capabilities to OTT players. The most common way to provide these capabilities are application programming interfaces (API). The majority of APIs offer access to charging, billing, short messaging and telephony services (cf. Kuebel et al., 2014). Depending on the operators strategic focus these interfaces are complemented with machine to machine (M2M), e-health or internet protocol television (IPTV) APIs (AT&T, 2014b; DeveloperGarden, 2014; Orange 2014). Initiatives such as the Open Mobile Networks Alliance and the GSM Association foster the development of cross-carrier APIs to decrease the partnership initiation costs (GSMA, 2014; Open Mobile Alliance, 2014). Moreover, specialized billing companies position themselves as integrators of APIs between OTTs and operators (Bango, 2012). Concerted efforts of OTT players and intermediaries contribute to a wide variety of billing partnerships (cf. Microsoft, 2014).

As a *Local service consultant* operators exploit their local market knowledge, brand and existing customer relations to explain and sell complex OTT services without owning the required service assets. In this type of cooperation an OTT service usually complements a broader operator business customer service and product portfolio which may be related to business units such as

marketing or network management. Examples include operators that position themselves as consulting premium reseller for OTT advertising or consulting reseller of on-demand office environments (Google, 2014b; Telekom, 2014b; Vodafone, 2013).

Technology integration refers to operator and OTT cooperation that aims at tighter integration of technological assets. Cooperative efforts focus at different goals such as the improvement of OTT service quality, enhanced OTT service device compatibility or distribution of basic operator services to different devices with OTT technology. Examples for cooperative quality improvement can be found in the offers of several major OTT players which provide special client server solutions that are deployed within the operator network (Google GGC, 2014; Netflix, 2014; Skype, 2011). These dedicated servers reduce the OTT dependence on intermediaries such as CDNs which have just recently begun to deploy their servers within the operator network (Akamai, 2013).

Another type of technology integration allows customers to link their operator telephone number with an OTT Voice over IP account. This cooperation enables OTT caller management and forwarding capabilities which had previously required complex telephone system hardware that would have raised numerous device compatibility issues (Google, 2013). Similarly operators use white label OTT technology to deliver existing IPTV offers to multiple screens enabling a so-called „TV-Everywhere” customer experience (Waterman, 2013; Zattoo, 2014). Finally, operators offer their services via apps in OTT ecosystems such as the Google play store or on Microsoft Xbox (Swisscom, 2014; Vodafone 2009).

Cooperation type	Key characteristic	Primary operator agreement benefit	Example	Source
Promotion	Amplification of the customer’s awareness for the benefits that can be derived from the OTT and operator service complementarities	Address special customer groups and faster reaction to market trends	Vodafone - Microsoft Xbox live	Vodafone NZ 2014
Bundling	Specially priced package of operator and OTT services	Creation of attractive service bundles for large customer groups	Telefonica - Napster	Telefonica 2014
Special OTT data tariffs	Non-uniform pricing for OTT data-usage	Offer a unique data plan in a market dominated by commodity services	Deutsche Telekom - Spotify	Telekom 2014a
Local service consultant	Operator incorporates complex OTT services in its business product portfolio	Operator is perceived as a full-range supplier that offers integrated business solutions	British Telekom - Google Adwords	Google 2014b
Access to customer data	Volunteered, observed or inferred customer data is shared	Leverage existing customer data for new business opportunities	Orange - Deezer	Orange 2013
Access to core services	Internal infrastructure capabilities are provided to	Open internal capabilities to partners to generate	AT&T - Google	Google 2014a

	partnering OTT players	additional wholesale revenues	Play	
Technology integration	Tight integration of technological assets to improve service quality and reach	Offer innovative services to benefit from first mover advantages and extend service availability	Sprint - Google	Google, 2013

Table 1. OTT service cooperation taxonomy for telecommunication operator business models

Though the identified cooperation types can be observed and described as discrete entities, some entity combinations can be observed on a regular basis. That is, cooperative promotion or bundling activities can be combined with special OTT data tariffs or the start of innovative services.

Patterns of cooperative value creation

As proposed in Osterwalder (2004) this section draws on Fjeldstad & Haanaes (2001) to assess patterns of value creation and relate them to the previously identified cooperation types. The results of this analysis will be summarized in Figure 3. Fjeldstad & Haanaes (2001) distinguish between three value configuration types: Value shop, Value chain and Value network.

A *value shop* sells approaches to solve unique problems for a customer and creates value by evolving a current into a more desired state (Osterwalder, 2004). The created customer value can be much higher than the costs of finding an appropriate solution (Fjeldstad and Haanaes, 2001). Operators who employ this value creation pattern need to exhibit the capability to understand specific customer needs and integrate internal and external resources (cf. Wallin, 2005). Moreover, availability and access to standardized OTT offerings constitute a prerequisite for a cooperative value creation pattern. The identified cooperation examples include operators that act as technology or advertising consultant (Google, 2014b; Telekom, 2014b).

In a *value chain* companies sequentially create value by transforming inputs into more refined outputs (Porter, 1985). A customer is paying for the value of the final refined service. Consequently a core capability of operating a value chain is the ability to produce a service at a defined quality and lower costs than the perceived customer value (cf. Wallin, 2005). Exemplary cost reduction measures in value chains involve economies of scale, efficient capacity utilization and learning effects (Fjeldstad and Haanaes, 2001). Primary value creation activities include the production of operator core services and OTT player cooperation initiation. The identified value chain related cooperation types include *promotion*, *bundling* and *special OTT data tariff*.

A *value network* is characterized by value generation through mediation of complementing partners and the generation of positive network effects (Fjeldstad and Haanaes, 2001). Service customers benefit from positive network effects through eased access to the services of participating partners. In the case of an OTT application platform like Google Play customers experience positive network effects from using Google devices if operators provide their services as a Google application. Similarly customers experience positive network effects if a partnering

OTT provider offers a billing option via the operator billing API (Google, 2014a). Due to compatibility requirements value networks are subject to a tradeoff between scale and service richness (Fjeldstad and Haanaes, 2001). That is, API and application store value networks provide basic compatibility to a wide number of partners and primarily benefit from economies of scale. In contrast, technology integration value networks can create particularly innovative and integrated services if the number of members is rather small (cf. Google, 2013).

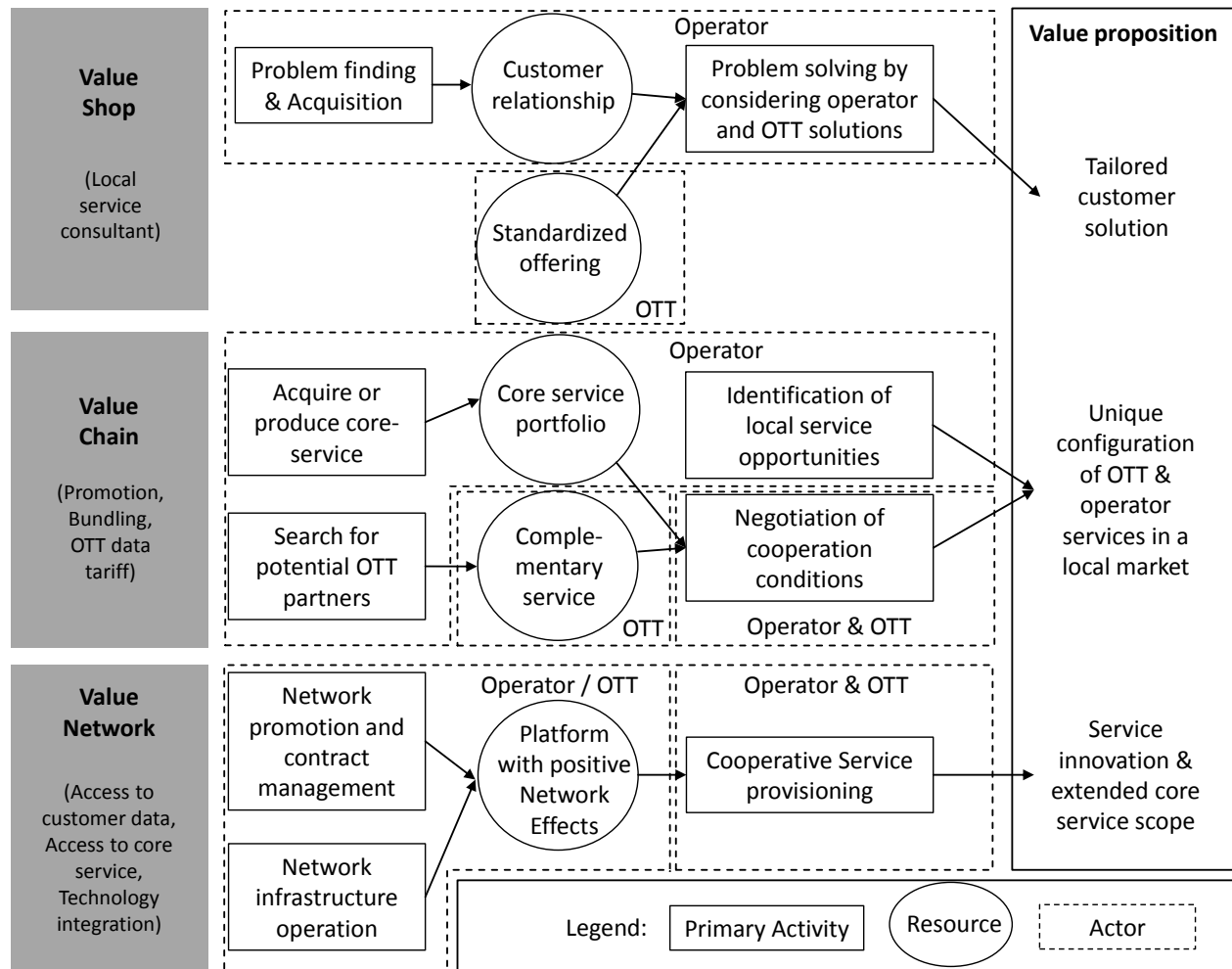


Figure 3. Cooperative operator and OTT value creation patterns (based on: Fjeldstad and Haanaes, 2001; Osterwalder, 2004)

Cooperation impact on the customer interface and financial aspects

This section explores and discusses the impact of cooperative operator and OTT value creation patterns on the customer interface and financial aspects of the operator business model. The results of the financial analysis will be summarized in Figure 4.

In a *value shop* central value creation activities are conducted by the telecommunication operator. Value creation potential is grounded in the operator consultancy's profound knowledge about the capabilities of the operator's telecommunication infrastructure. A technology agnostic approach to solving problems and short lines of communication with internal operator departments contribute to low customer coordination requirements. Operator consultancies usually exhibit good knowledge about the local market, security requirements and local laws. Moreover, operators maintain multifaceted relationships with a large number of local business customers. This customer base constitutes the basis for economies of scope in project acquisition.

With respect to the Osterwalder business model ontology the OTT offer can be considered as a complementary resource to the consulting business model. It extends the scope of consulting projects which can be handled by the operator. The cooperation enables the operator to streamline its internal cost structure in terms of fixed consultant salaries while providing a broad scope of consulting solutions to customers. Existing consulting revenues can be retained or extended if the operators manage to attract new target customers with best-of-breed solutions. Retail revenues will increase if the proposed customer solutions are implemented by the operator's operational business units. Existing customer relationships are likely to intensify if the operator is implementing itself as the primary point of contact for all operator and OTT services.

Value chain activities are of central importance to the core business model of most reselling and integrated telecommunication operators and subject to economies of scale. Customer value configurations are often changed on a monthly basis to attract new customers. In this dynamic market superior performance can primarily be achieved through cost efficient processes or value chain differentiation (cf. Porter, 1985). For every step of the value chain operators need to decide whether to produce a service internally and stay in control or whether to buy it externally and retain flexibility (Li and Whalley, 2002).

In the Osterwalder business model ontology cooperation with OTT players enables operators to differentiate their service portfolio without the need of new asset specific investments. Fixed costs can be transformed into variable costs if operators decide to incorporate OTT services instead of producing a service with internal resources. Thus, cooperation is a way to partially overcome the tradeoff between cost leadership and value chain differentiation. Moreover, cooperation can facilitate the creation of new operator retail revenues if operators sell premium OTT services and agree on revenue sharing. At the customer interface operators can attract OTT agnostic customers with product bundles or tariffs which can be exclusive to a specific regional market. Existing and potential customer relationships are likely to benefit from eased billing or integrated service support.

Value network activities can be observed in the business models of operators and OTT players. Intra- and inter-industry value networks compete to provide new services to a broad number of customers. Superior performance of value networks is heavily depending on the mediator's ability to create positive network effects for all network members through large network scope or tight partner integration (Fjeldstad and Haanaes, 2001).

In the Osterwalder business model ontology value network cooperation implies costs on top of expenditures for core business value chain activities. Promotion costs are specific to a value network and cannot be redeployed for other purposes. Thus, value network investments are associated with higher risks than value chain activities. However, successful value networks stand to gain high additional revenues through the presence of positive network effects or through first mover advantages with innovative services. On the customer interface value networks open up access to new distribution channels as OTT agnostic customer groups can use OTT app stores to consume operator services outside the scope of the operator’s physical infrastructure. For mediators of app stores or API platforms this can be an additional wholesale revenue source. Superior service quality or innovative services can be a source of retail revenues from new customers target groups.

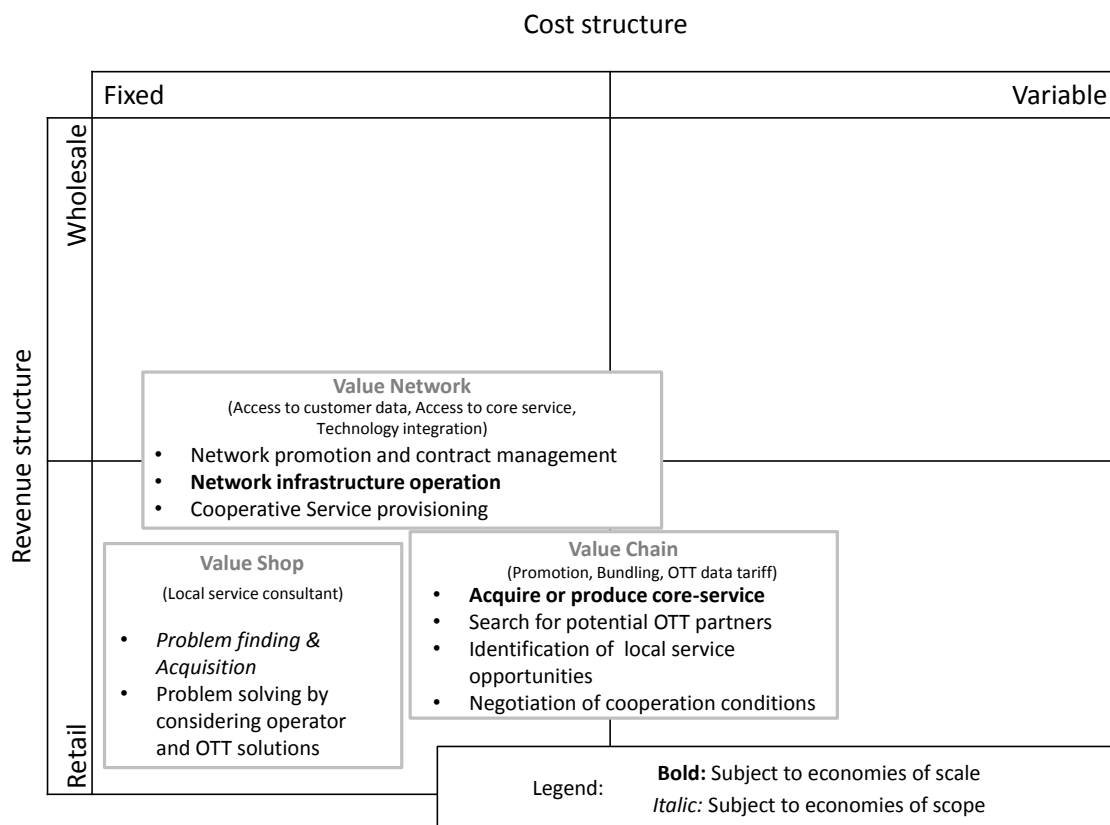


Figure 4. Cooperation impact on operator cost and revenue structure (adapted from Wulf et al. 2010)

Summary and Conclusion

The objective of this paper is twofold. First, it provides a holistic view on service cooperation between OTT players and telecommunication operators. Second, it explores the cooperation type impact on the operator business model. This second step uses the Osterwalder business model Ontology to assess the business model infrastructure with respect to patterns of cooperative value

creation. Thereafter, the impact on the customer interface and financial aspects of cooperative service provisioning is explored.

The conducted analyses indicate that seven types of cooperation between OTT players and telecommunication operators can be distinguished: *Promotion, Bundling, Special OTT tariffs, local service consultant, access to customer data, access to core services, technology integration*. Every cooperation type holds different operator benefits and key characteristics. Moreover, findings suggest that cooperation types are not mutually exclusive but can be combined to aggregate cooperation benefits.

The assessment of the business model infrastructure management dimension shows that the identified cooperation types can be related to three generic value creation patterns.

In cooperating with OTT players operators can position themselves as *local service consultant* that integrates complex OTT offers with proprietary services to create value by solving specific customer problems. The success of this value creation pattern depends on trustful customer relationships and the ability to identify complex meaningful problems that customers can or will not solve themselves. By leveraging economies of scope additional retail revenues can be generated.

Promotion, bundling and *special OTT tariff* cooperation create market specific unique customer value proposition based on an operator's portfolio of standard core services. Successful offers will include OTT services with a high perceived customer value and may be exclusive within a regional market. Revenue sharing from selling premium OTT tariffs can be a source of additional operator retail revenues.

Access to customer data, access to core services and *technology integration* cooperation create customer value through service innovation or new service distribution channels. Successful services should exhibit a high innovation degree or attract a large number of users for the service distribution platform to generate retail or wholesale revenues, respectively.

All three proposed value creation patterns and their corresponding business models can in general be conducted by reselling or integrated telecommunication operators. However, operators should adapt business models to their core competencies. Successful resellers are characterized by low operational costs and efficient processes. This should be reflected in cooperative service provisioning. A reselling operator may for example choose a bundling cooperation instead of a special data tariff which is associated with higher initiation and operation costs. Moreover, a reseller's consulting scope may be limited to marketing projects. In contrast, integrated operators will leverage their technological know-how and spend additional money to create more integrated services with a higher perceived customer value.

Further research may address the question if the general customer valuation of simple tariff structures and value propositions is limiting the number of cooperation agreements per operator? Moreover, the impact of OTT player and operator size on the direction and shares of revenue streams, specifics of the partnership agreement and cooperation sustainability could be explored in future papers. Finally, this paper has outlined the diversity and innovation potential of technology integration cooperation. Thus, further research could use a case study approach to explore the success factors and barriers for this cooperation type.

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