

White Paper



MVNO Business – Creating a Win-Win Model

A short guide for MVNOs and mobile network operators



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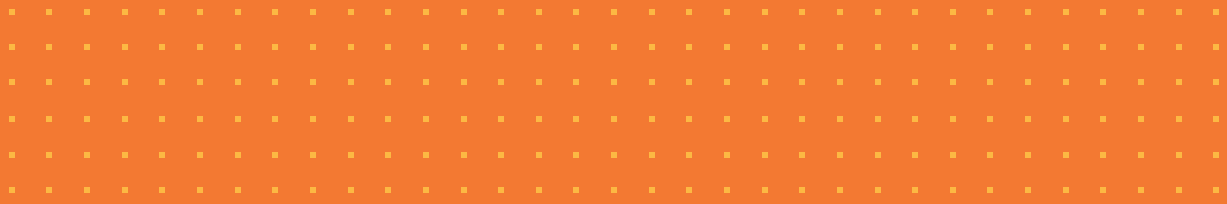
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What will you learn?



- What kinds of MVNOs there are on the market
- What features should be taken into account in the search of a perfect MVNO platform solution
- What deployment models are possible in the MVNO business
- Why MVNOs are an opportunity not a threat for the mobile operators' businesses
- What models of MNO / MVNO cooperation can be considered
- How Comarch responds to the needs of the MVNO / MVNE market with a dedicated BSS solution
- How Comarch's solution worked in reality – Auchan Telecom and Vistream case studies

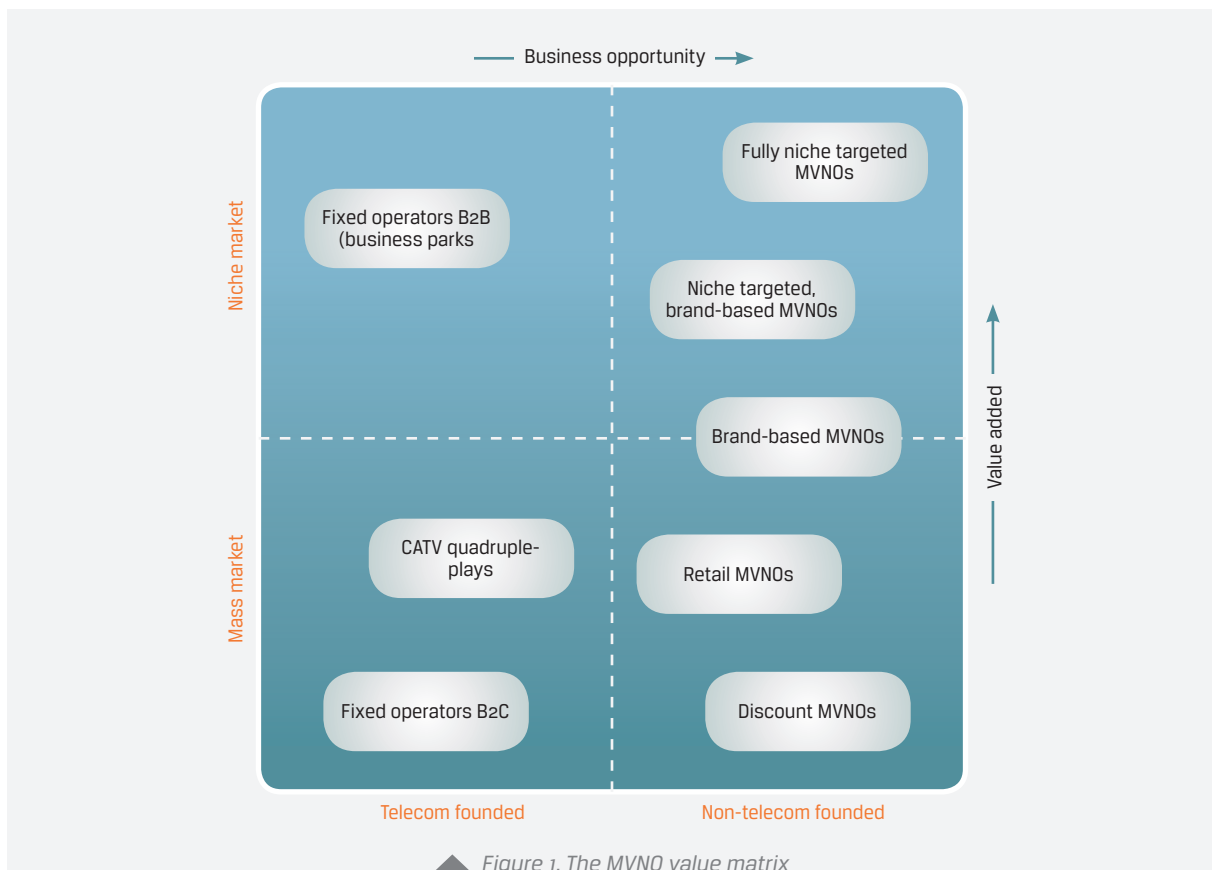
■ The World of MVNO

A Mobile Virtual Network Operator (MVNO) is a mobile telecommunications market player that does not own a licensed frequency spectrum. As a consequence, MVNOs act as resellers of their host network's capacity under their own brands, to their own customer segments, often providing a portfolio of segment specific value added services. The exact definition of an MVNO has always been problematic due to the diversification of approaches, MVNO origins, business models and targeted markets. Also, the integration depth with hosting mobile network varies from case to case, from MVNOs no different than standard traffic resellers (Service Providers) to those closely integrated (the so called full-MVNOs) that own some core elements of the mobile telecommunications network (excluding the radio access network).

MVNOs can be classified into the following categories:

- Discount MVNOs – providing competitive prices to market segments with typically lower revenue per customer, often in the prepaid-only model. Typically, their strategy is based on offering simple services (e.g. voice and SMS only, often with no or little data offering) and cheaper handsets for sub-prime markets
- Niche MVNOs – providing tailored services to niche markets often overlooked by traditional mobile operators, such as youth, ethnic groups or specific business users. These segments are often valuable but require specific offerings with many value added services and add-ons for the service to be found attractive by potential customers. Examples of niche MVNOs are in&phone and Ay Yildiz.
- Retail MVNOs – providing services for end customers via existing points of sale. The subscribers can purchase the SIM card and top-up their account during a visit to a supermarket. Examples here include Auchan and Tesco.
- Advertising-Driven MVNOs – providing a specific amount of free minutes, SMS's and content to their subscribers, in exchange for sending advertisements to subscriber mobile phones. Blyk is the most known operator in this sector.
- Brand MVNOs – providing similar offerings as traditional mobile operators but taking advantage of their strong, recognizable brands and customer loyalty. The example here is Virgin Mobile UK.

As it can be noticed from the information above, today's MVNOs do not necessarily originate from the telecoms industry. Another classification approach is the MVNO value matrix



Non-telecoms based MVNOs are able to target profitable market niches and attract more customers by taking advantage of their recognizable brands and well tailored mobile offerings.

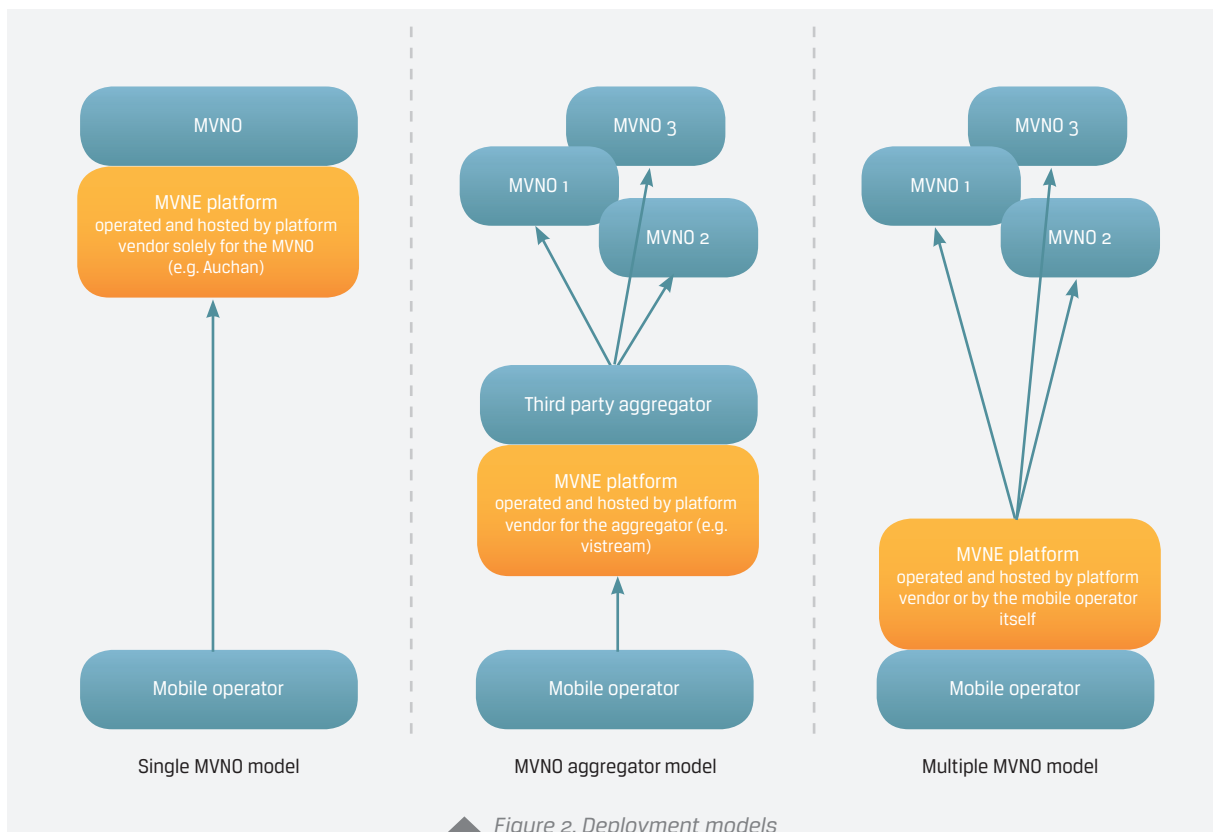
presented in the figure below. It indicates that non-telecoms based MVNOs are able to target profitable market niches and attract more customers by taking advantage of their recognizable brands and well tailored mobile offerings. These players are able to explore the market potential more comprehensively than companies with a telecoms background (e.g. fixed operators entering the mobile market or CATV operators turning to quadruple-play). What opens exciting possibilities for MVNOs offering services beyond discount voice and SMS is also the popularization of 3G+ networks enabling new applications and services, thus leading to further specialization.

Along with the evolution of MVNOs and their growing needs, a market of mobile virtual network enablers (MVNEs) has emerged. MVNEs provide MVNOs with all necessary back-office operations and IT platforms allowing them to concentrate on the core of their mobile business – developing new tariffs and services and taking care of customer acquisition and retention. This aspect becomes even more relevant in the light

of how many new MVNO market entrants originate from sectors other than telecommunications (e.g. FMCG retail, entertainment) and lack sufficient expertise to cooperate closely with mobile operators and develop or maintain necessary IT platforms. The matrix above indicates clearly that such support-seeking parties are the ones with most market potential. Such companies have excellent brand and business ideas in combination with vast potential, but lack telecommunications experience to establish relations with mobile operators and handle future low level operations.

For a modern and success oriented MVNO the key factor in choosing a solutions platform should not only be minimal up-front investment but also its ability to adapt quickly to changes on the market. To accomplish this, the following software features should be available:

- **Easy service construction** – reduces development and deployment time and cost
- **System flexibility** – readiness to cope with a broad range of today's and future services
- **Fast innovation** – required to attract new customers and retain current ones, enables a fast response to offers from competitors
- **Low cost of operations**



Together with MVNE requirements, we can see a new class of solutions which simplify initial MVNO processes. The diagram below illustrates possible deployment models for such solutions:

In the first approach (**single MVNO model** – see Auchan case study) the MVNO platform is hosted by the platform vendor and runs solely for the virtual operator. The MVNO negotiates the traffic wholesale agreement with the mobile operator by itself and utilizes the outsourced platform. All necessary hardware and software maintenance is performed by dedicated engineers and the platform is hosted by the Data Center. The MVNO takes care of appropriate marketing, customer acquisition and management, sales channels management and relies fully on the experience of experts' in the field of mobile-related BSS and OSS. There is no intermediate party between the network operator and the MVNO in this case, but the economies of scale when it comes to MVNE platform components deployment and maintenance are not fully utilized.

In the second approach (**MVNO aggregator model** – see Vistream case study) a third party plays the role of a middleman between the mobile network operator and multiple MVNOs. Such an "aggregator" is responsible for negotiating the agreement with the MNO and resells the traffic to all MVNOs it is hosting on the platform. The platform is maintained by the platform vendor and hosted by the Data Centers. In this scenario, MVNOs are responsible only for the front-office operations of their mobile businesses. The advantage for them is a further reduction of up-front investments necessary to start the operations. On the other hand, the aggregator applies its margins using the costs of the mobile operator's network capacity usage.

In the third approach (**multiple MVNO model**) the third party is not involved and the mobile operator deploys its own mobile virtual network enablement platform.

■ New business opportunities for MNOs

Almost all analysts agree that the opportunity for mobile operators to take advantage of MVNOs outweighs their competitive threat. Moreover, the competitive threat argument is questionable considering prices would continue to fall even without the presence of MVNOs. Ultimately, there will be an increasing need for mobile operators to fill their networks (e.g. 3G or 4G), regulators will demand further roaming and inter-connection reductions, mobile-only operators will use lower prices to advance fixed-mobile substitution, and new companies with disruptive technologies (like VoIP) will compete by offering even cheaper voice packages. Many operators are already exploring the huge potential of the market.

Major mobile operator motivating factors for hosting MVNOs can be summarized as:

- **MVNOs Target Consumers Better.** The host network often faces high churn rates resulting from one-size-fits-all brand positioning. MVNOs often have strong brand names and a niche focus that give operators the means to fight that churn. Mobile operators often find it difficult to succeed in every customer segment. Whether alone or with value added service partners, MVNOs are a way to implement a more specific marketing mix that can help target specific market segments.
- **MVNOs Increase Reach and Scope of Mobile Offers.** Mobile network operators that host MVNOs extend their "shelf space" as a choice for consumers. In addition to new retail and marketing channels, consumers in search of the best personalized mobile deal see the MVNO offer next to those of network operators, bringing operator-hosted services greater visibility and increasing the chances of consumers choosing their network.
- **MVNOs Lower Costs.** The host mobile operator can eliminate marketing and customer acquisition costs, handset subsidies and running costs for customer maintenance by enabling a relatively independent MVNO to focus on supporting customers. The host mobile operator can also avoid the ongoing cost of specific value-added services, which is also covered by the MVNO.
- **MVNOs Help Utilize the Network more Efficiently.** Many network operators have a capacity which is not fully utilized. In addition, 3G has created the opportunity to propose versatile content offers to possible clients but still lacks proper segmentation. MVNO strategy can fill this gap and generate economies of scale for better network utilization.

MVNEs have emerged from MVNOs' need to lower upfront and ongoing investments to operate their businesses – costs associated with setting up wireless operations, even for a virtual operator, are significant and few can justify the risks. Along with the MVNO model, the MVNE model is evolving from pure outsourcing to more of a venture capital model. The MVNE offering will be expanding from per usage based fees to models with sophisticated revenue sharing or joint venture strategies in which MVNEs bring in their expertise in exchange for a stake. Therefore, it is crucial to have an IT platform ready to support versatile business cooperation scenarios.

Instead of taking the market share away from mobile operators, MVNOs create new business opportunities and increase the revenue. With vast amounts of unused bandwidth to share and the inability to provide proper services to all market seg-

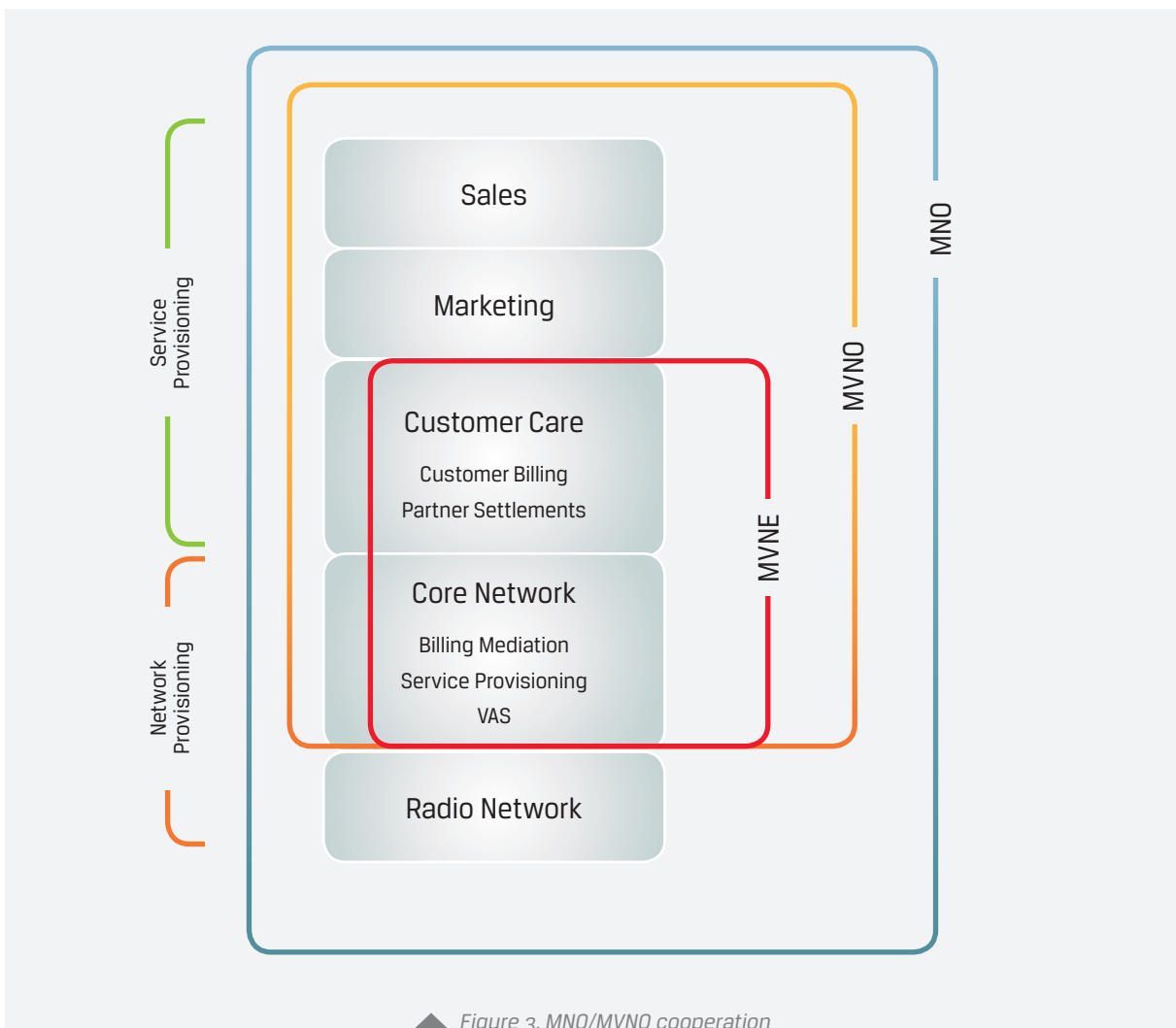
Almost all analysts agree that the opportunity for mobile operators to take advantage of MVNOs outweighs their competitive threat. Moreover, the competitive threat argument is questionable considering prices would continue to fall even without the presence of MVNOs.

ments and niches by traditional operators, it is a classical win-win situation with greater economies of scale and more value added for end-customers. Successful MVNOs will convince a mobile operator by offering:

- **Analysis of new market opportunities** demonstrating potential new revenue streams
- **Evaluation of new revenue streams** and revenue sharing offers to provide money making opportunities for both parties

- **New distribution channels** and **services** targeting new customers in new niche markets
- **Possibility to reduce churn** and increase customer retention by providing better customer care within segments and by utilizing MVNO's brand loyalty
- **Established chain of partners** providing content or VAS

The MVNO paradigm provides companies with access to revenue-generating goods and services and transfers their specific experience to the wireless markets. On the other hand, mobile operators acquire access to new markets and additionally, they gain access to specialized content and services. Sharing some business processes will certainly result in their overall performance increasing. The figure below depicts the overlapping operation areas of MNO, MVNO and the MVNE platform.



▲ Figure 3. MNO/MVNO cooperation

■ Comarch MVNO/MVNE platform

This Comarch Platform is the outcome of extensive domain knowledge and experience accumulated throughout our long-standing presence on the telecommunications software solutions market. The platform is a modular and scalable solution based on selected elements of Comarch's award winning

BSS/OSS product suite. The whole platform is a one-vendor, pre-integrated and preconfigured solution able to cover all the unique needs of any modern MVNO by providing the complete Mobile Virtual Network Enabler Platform, which can be deployed in all three models mentioned on the diagram (Figure 4).

The Platform enables the independent company to commence its MVNO business and integrates it with one or more network operators, as well as allowing the MNO to commence its MVNE business.

Below is a list of the key support areas that were identified and are fully covered by our software components:

- Possibility of hosting multiple MVNOs and multiple partners on one platform
- Convergent rating and billing in postpaid and prepaid models of virtually any type of service including:
 - Voice and video-call services
 - SMS/MMS
 - Packet data services
 - Multimedia (audio/video-streaming, downloads)
 - Additional third-party content or value added services
 - Fixed-mobile convergence
- Wholesale interconnect and inter-partner settlements and reconciliation with revenue sharing
 - Roaming
 - Number portability support
- Management and support for business processes, e.g.:
 - Service ordering
 - Trouble-ticketing
- Customer web-based self care capabilities with customizable 'look & feel' for each MVNO

- Distributed POS business model with web-based dealer application and support for commissioning
- CRM functionalities
 - Call center interface
- Interfacing to back-office and third party systems, e.g.:
 - General ledger
 - Print house
 - Logistics
 - Financial (bank, credit card authorization)
 - Credit scoring
 - External IVR
- Network related – mediation and service provisioning on various types of network elements and/or interfaces
 - Usage data collection and processing
 - Automatic service activation / deactivation

Our scalable solution consists of selected elements of our BSS/OSS suite that has been used in numerous successful implementation projects worldwide. The following software components are used in the Comarch MVNE Platform:

- Rating and Billing
 - **Comarch Billing System** – a super scalable, convergent, carrier-grade rating, billing and accounting system. The Billing System acts also as a central repository of customers, has a flexible and easily configurable rating engine, advanced reporting subsystem and an easy-to-use interface. Its convergent real-time rating engine allows handling both prepaid and postpaid services on the same platform.
 - **Comarch InterPartner Billing** – interconnect and inter-partner settlements system for revenue sharing and reconciliation. Comarch InterPartner Billing is an important component for multi-party revenue sharing, one of the most crucial aspects of today's MVNO business. If necessary, Comarch InterPartner Billing can be extended using the roaming module for handling TAP/RAP file processing and roaming settlements.

- **Comarch Voucher & Top-Up Management** – platform for prepaid scratch-cards generation and top-ups management.

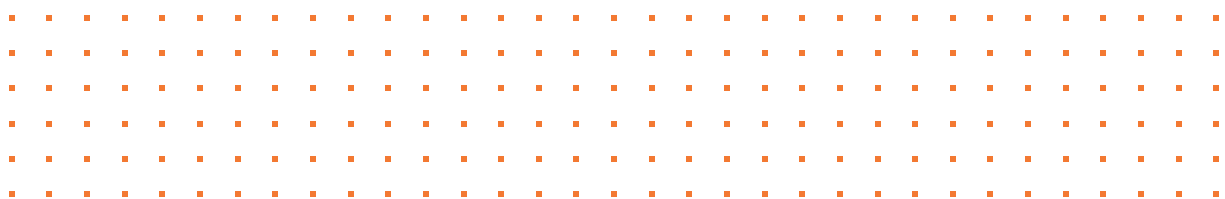
○ Customer Care

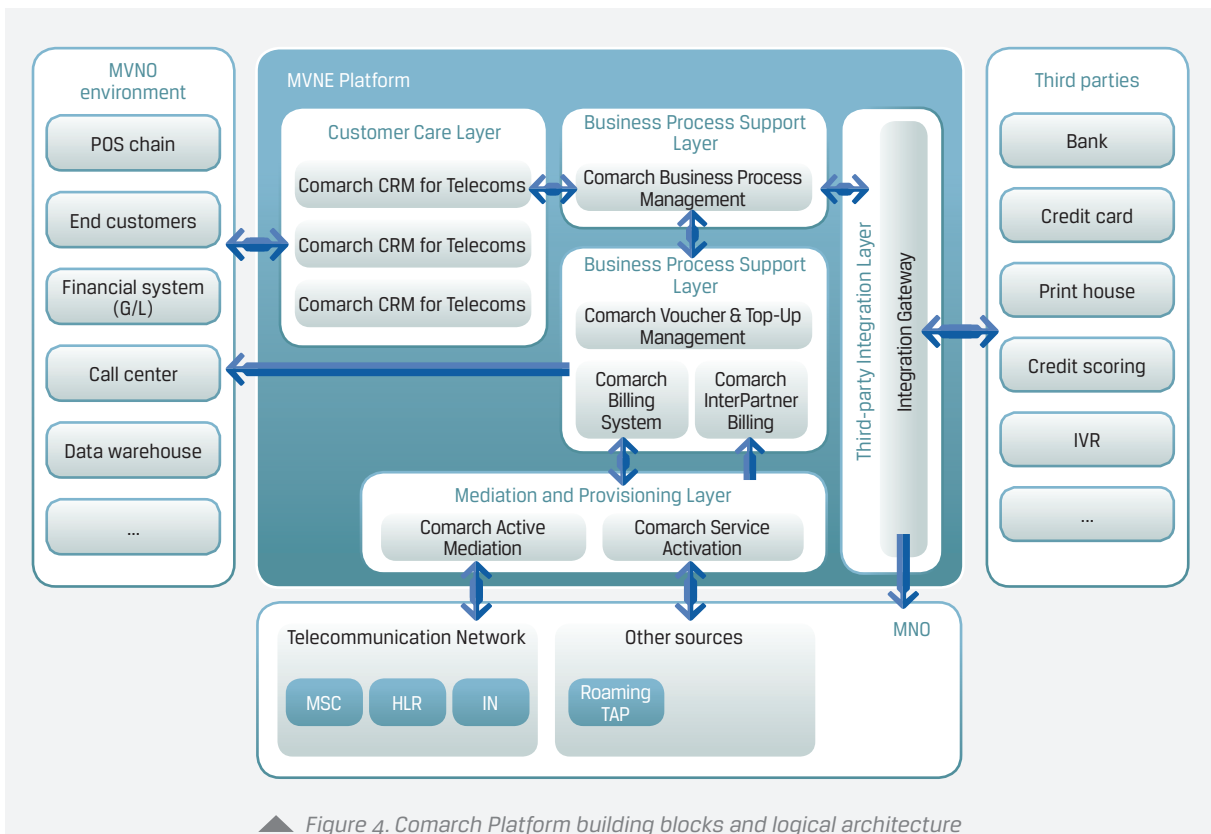
- **Comarch CRM for Telecoms** – a web based customer management solution fully integrated with the Billing System. CRM for Telecoms can act as a call center interface or CSR panel for MVNO's front office.
- **Comarch Business Process Management** – an industry standard based workflow engine to handle all kinds of operators business processes (ordering, trouble ticketing and more). The BPM is equipped with a graphical process modeler and integrates easily with all other platform components, including the Billing System, Customer Management and the Point of Sale components.
- **Comarch Customer Self Service** – a web based self care interface for end-customers enabling them to perform any kind of account-related operation anywhere and at anytime (prepaid replenishments, service ordering). Customer Self Service is integrated with the Billing System.
- **Comarch Point of Sale** – a web based POS module for customer registration and service ordering in distributed dealer chains, integrated with the Billing System.

○ Network Mediation and Service Provisioning

- **Comarch Active Mediation** – for real-time integration of the Billing System and network elements which support most industry standards and protocols necessary for real-time connectivity to switches or interfaces provided by MNO. Comarch Active Mediation is also capable of performing all mediation-related tasks such as collection, decoding, aggregating, de-duplicating, correlation, enriching, filtering, validating and encoding of traffic records on virtually all types of network elements.
- **Comarch Service Activation** – a service provisioning suite for instant activation and manipulation of services in core network environments, fully integrated with the Billing System.
- External interfaces
- Comarch Integration Gateway – a subsystem used for interfacing external and third-party systems (e.g. credit card authorization, the IN platform) providing a set of high level XML-based web services for solution components integration and isolating specific low level interface details. This component additionally works as a B2B gateway.

Not all our components are mandatory for platform deployment. Depending on specific needs, Comarch is able to build an IT platform of all or a subset of the above. Modular architecture makes it possible to upgrade the platform in the future as new requirements are identified. The diagram below presents the logical architecture of the full Comarch MVNE solution and possible interaction between platform components, a hypothetical environment of one MVNO and external or third-party systems.

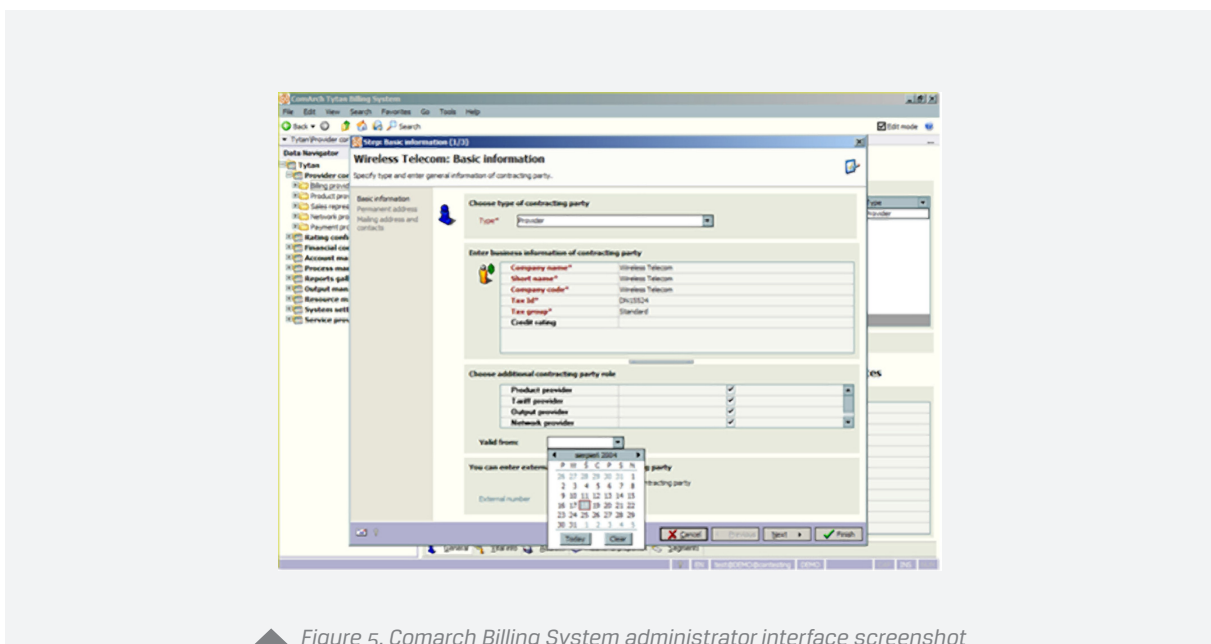




▲ Figure 4. Comarch Platform building blocks and logical architecture

As shown above, the complete MVNE platform consists of six functional layers responsible for different parts of MVNO operations. All the components are based on industry established standards and are state-of-the-art, recognized software products. Our software experts have employed only the most modern and reliable technologies in developing billing systems. The system kernel runs in a secure operating system (UNIX)

and database management system (Oracle). Applications are built using fourth-generation tools (4GL), C programming language for low-level routines and proven design and development tools. For the user interface, Windows-based user interfaces are used. A sample Comarch Billing System screen is presented below.



▲ Figure 5. Comarch Billing System administrator interface screenshot

■ Case Studies

The following sections present case studies of two typical implementations of the Comarch MVNE Platform – a single MVNO deployment model for a major French FMCG retailer and an MVNO aggregator model for Germany's first MVNE.

Auchan (single MVNO model)



Auchan is an international retail group and a multinational corporation headquartered in Lille, France. Since opening its first outlet in Roubaix in northern France back in 1961, Auchan has enjoyed continuous expansion. Currently, Auchan is present in twelve countries worldwide, employs over 175,000 staff and generates annual revenue of €38.6 billion (\$50.3 billion), making it one of the world's leading retail groups.

The pressure on Auchan and Comarch to deploy the solution within three and a half months was enormous. The involvement and confidence of both parties', Comarch's preconfigured components' technical flexibility and our engineers' expertise in MVNO business made it possible.

In May 2006, Auchan announced that it would launch mobile telephony services using the MVNO model by the end of the year. Auchan decided to choose Comarch as a vendor of full IT solutions for MVNO. Comarch was selected as a partner in this project due to its complete OSS/BSS product portfolio, strong references in the MVNO market and commitment to timely delivery of the solution.

The pressure on Auchan and Comarch to deploy the solution within three and a half months was enormous. The involvement and confidence of both parties', Comarch's preconfigured components' technical flexibility and our engineers' expertise in MVNO business made it possible. The system went into production mode in mid October, 2006. Auchan was able to commence its operations as initially planned, gaining a significant competitive advantage on the French market.

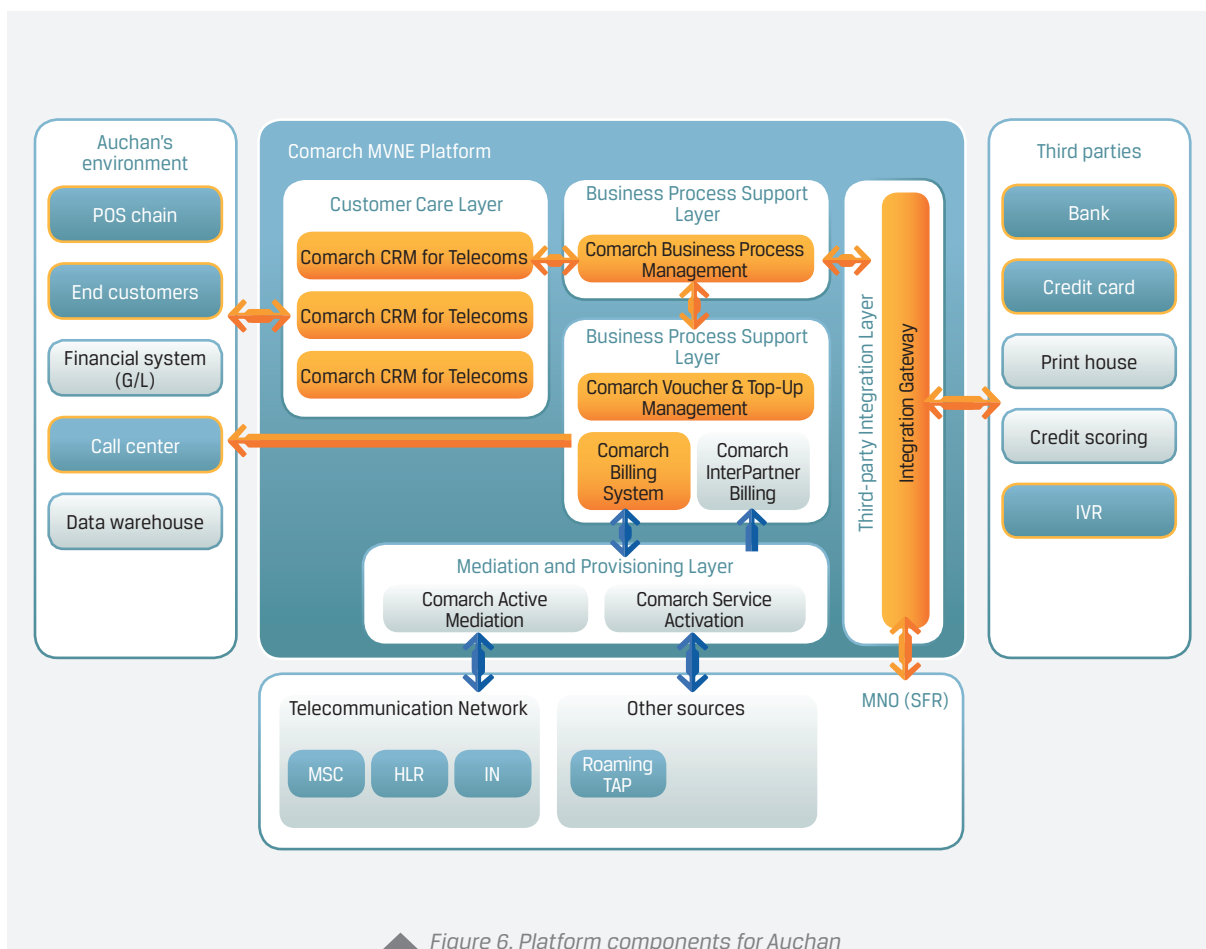
Auchan decided to launch mobile communication services (voice, SMS and data) using the prepaid model at the first stage. The following functional areas were identified for this project:

- Customer and service repository management
- Interfaces to several external systems – credit card authorization center, bank, external IVR, VAS platform, cashier system and data warehouse
- Interfaces to the host mobile network (SFR in France) for EDR collection, IN Prepaid integration (charging, balance replenishments) and service provisioning
- Pre-paid scratch cards management
- Web based end-customer self care portal with usage and financial information, service ordering and prepaid balance top-ups functionalities
- Web-based application for Auchan's call center
- Simple and easy-to-use interface for points of sale
- Support for Auchan's MVNO-related business processes (workflows)
- Readiness for future upgrade to support postpaid settlements model

Auchan decided to choose outsourcing model deployment in which all IT platform components are located in Comarch Data Centers and Comarch engineers handle ongoing hardware and software system maintenance.

With the MVNO segment differentiating so strongly from Auchan's core line of business, Comarch engaged more consulting and analytical resources than they would have in a standard telecom project. This was done to provide Auchan's decision makers with an advanced view of technical alternatives, advantages and drawbacks of the different approaches.

Although the project scope was broad and several Comarch software components were used, the team managed to complete it on time. Project analysis started in June 2006 and the system was implemented, tested and fully operational by October 16th, just a day over the original, ambitious launch date that was defined in the project plan. The solution consists of the Comarch Billing System, Comarch CRM for Telecoms, Comarch Business Process Management, Comarch Customer Self Service, Comarch Point of Sale, Comarch Voucher & Top-Up Management and the Integration Gateway – which has been working without any problems ever since. Short deadlines did not impose any functionality reductions whatsoever. The solution's logical architecture is presented in the diagram below.



▲ Figure 6. Platform components for Auchan

As shown above, Auchan took advantage of the Comarch MVNE Platform's modularity and decided to implement only some of its elements at the first stage of the project (marked red). However, the platform may now be extended at any time without any implications to existing functionality in order to provide Auchan's customers with new services and to make the retailer's mobile business even more successful.

■ Vistream (MVNO aggregator model)

Vistream is the German-based daughter company of MATERNA Information & Communication GmbH. Vistream was es-

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tablished in September 2005 in Dortmund as Germany's first real Mobile Virtual Network Enabler (MVNE) utilizing MATERNA's partner contract with E-Plus Mobilfunk GmbH & Co. KG

wireless network and providing B2B services for companies that want to establish their positions as Mobile Virtual Network Operators (MVNOs).

Vistream offers its GSM and UMTS solutions, as well as value added services for companies with established customer contacts that enter the mobile world under their own brands – the so called "branded retailers". Furthermore, Vistream enables triple-play operators, ISPs or media companies to extend their offering with mobile components, offering customers completely novel services such as mobile multimedia, interactive TV shows or SMS/MMS chats. In a typical scenario, a new MVNO uses its sales channels, brand power and customer relationships to market mobile services and returns a share of net sales to Vistream.

The company operates like a real MVNE and possesses some elements of the core GSM network to make their offering more flexible and able to satisfy any potential branded retailers needs (MVNOs). That includes MSC, SMSC and MMSC, and a WAP Gateway owned by Vistream and integrated into E-Plus network infrastructure. Vistream acts as a real network operator and as such, is able to offer customers throughout the

whole of Germany their own independent interconnect and roaming agreement terms.

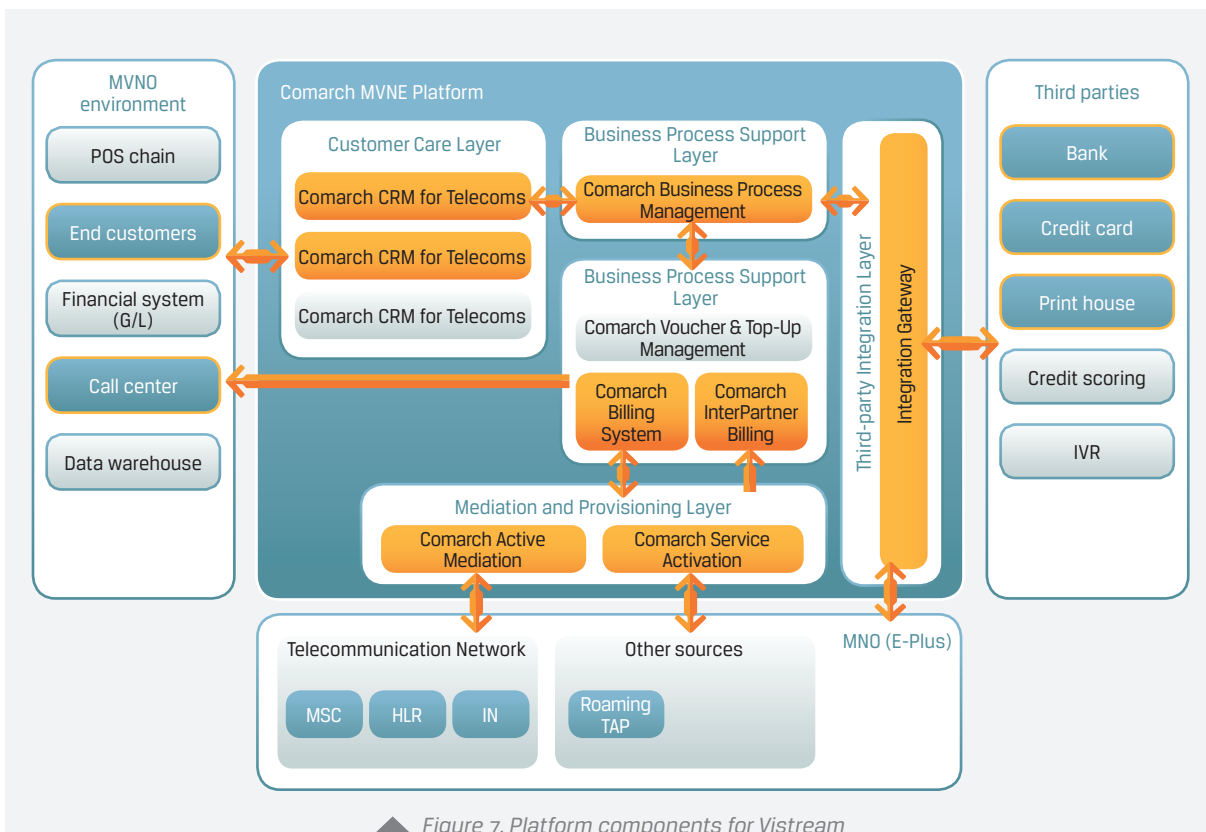
Vistream chose Comarch as a supplier of the MVNE enablement software platform. Project scope included the delivery of software components, platform implementation and integration with Vistream's existing systems. The platform for Vistream included the following Comarch products:

- Comarch Billing System
- Comarch InterPartner Billing
- Comarch CRM for Telecoms
- Comarch Customer Self Service
- Comarch Active Mediation & Service Activation

For platform operation, Vistream decided to choose the Comarch Managed Services option and therefore, the platform is hosted at the Comarch Data Center in Krakow (Poland) and is maintained by Comarch's skilled engineers.

The following key characteristics could be enlisted for Vistream's platform and were successfully implemented:

- Rating and billing of GSM/UMTS voice, SMS/MMS, data and multimedia value added services with bad debt collection and payments processing
- Prepaid and postpaid models
- Integration with MATERNA MACS – Mobile Application and Content Server – MATERNA's (Vistream is wholly owned by MATERNA) flagship product for telecommunications
- Full number portability (MNP)
- Interconnect and roaming (TAP3) settlements with Vistream's host network (E-Plus), between Vistream and MVNOs and between Vistream and other interconnect partners
- Customer Management and Self Care functionalities with MVNO isolation on one platform – MVNOs perceive the platform as if they are using it exclusively, whereas Vistream controls it globally



▲ Figure 7. Platform components for Vistream

○ Mediation and Provisioning for the following network elements:

- MSC
- IN Platform
- MMSC/SMSC
- GGSN
- VAS Platform

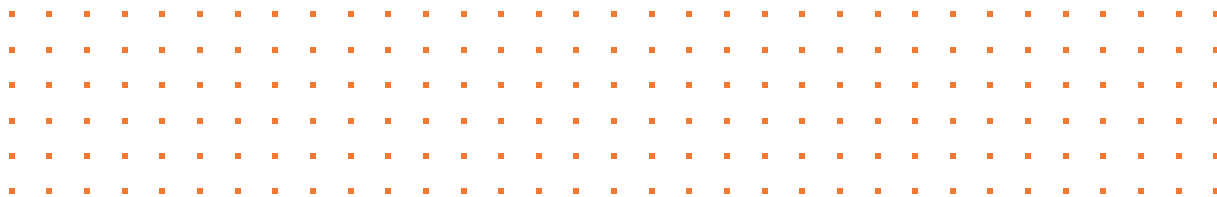
○ Integration with existing Vistream systems and third-parties:

- MACS – see above
- Financial system and data warehouse
- Print house
- Credit card authorization
- Voucher management system

The diagram below presents Vistream's platform architecture as part of Comarch's complete MVNE solution. Deployed components are marked red. For platform operation, Vistream decided to choose the Comarch Managed Services option and therefore, the platform is hosted at the Comarch Data Center in Krakow (Poland) and is maintained by Comarch's skilled engineers.

Project implementation started in March 2006, and in September 2006 the Vistream MVNE platform was successfully launched. Vistream became Germany's first real Mobile Virtual Network Enabler with a comprehensive offering for businesses wanting to enter the lucrative mobile telephony market.

As of December 2006, the platform is hosting five fully operational MVNOs and a further five are implemented and awaiting their commercial launches.



If you have any questions or comments regarding this white paper, please contact the author:

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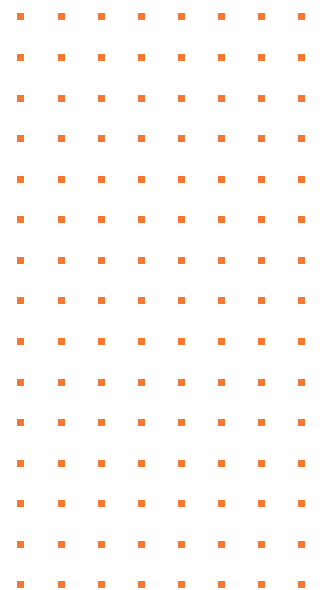
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