FULL PRODUCT OFFER FOR TELECOMMUNICATIONS
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## SUCCESS

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## WHY COMARCH

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Telecoms have helped to build the global supply chains. They have made constant access to information and instant communication a reality. Today, people and businesses across the globe depend on their mobile operators to provide them with innovative services needed in everyday life.

While the potential of innovative technologies such as 5G, AI and IoT is unquestioned, telecoms require IT tools to manage the digital processes and network operations that those technologies influence. Now is the time for key processes in your company to become automated and digitized, and to find the right partner to help you face the coming challenges.

Comarch, as an expert in telecom transformation projects, is there to support you. Since 1993, Comarch has helped many telecoms operators worldwide embrace new technologies and grow their businesses. We understand the needs of our customers, which is why we provide them with IT products that are highly modular, scalable and ready to support any future technology.

Choose Comarch to be your partner in the digital era. Let's shape the world of communications together.
As part of Telefónica’s strategy, our network and operation support systems play a crucial role as enablers of the services we provide to our clients. Implementing Comarch Next Generation Network Planning is a major step towards improving the efficiency of network planning and optimization processes in our subsidiaries in Latin America. Comarch was chosen as it has already proven to be a trusted partner of the Telefónica Group in Europe, and shown a great degree of flexibility in meeting our needs. The current implementation will provide an integration platform for a best of breed OSS solution, unified and reused across the group.

José González Díaz
DIRECTOR OF TRANSFORMATION & OSS, GLOBAL CTO AT TELEFÓNICA S.A.
FULL PRODUCT OFFER FOR TELECOMS
PROVIDING ENTERPRISE SERVICES GLOBALLY

ENTERPRISE PRODUCT CATALOG

Enables simple and flexible storage of the entire CSP product portfolio in one place, via slave catalogs used for sales, charging and billing. Multi-tenancy, multi-currency and multi-taxation support.

DIGITAL BILLING AND REVENUE MANAGEMENT

Multi-currency and multi-taxation functions, allowing the creation of financial documents for customers and partners. Flexible rating rules apply to enterprise customers.

PARTNER MANAGEMENT

Get automation and flexibility in liaising with partners and third parties by modeling of any type of service. Secure and easy to deploy, with multi-currency, multi-tenancy and multi-national support.

WHOLESALE BILLING

Allows service and content providers to exchange billing data and invoices, and share revenue/cost information with partners. Easily scalable for all agreement types.

GLOBAL NETWORK OPERATIONS CENTER

Comarch network operations center is your own high-security “mission control”. We analyze and resolve problems, update software, distribute security patches, and manage routers and domains on your behalf.
ENTERPRISE PRODUCT CATALOG

- **Implement a product catalog ready for any roles and multiple partnerships**
  Benefit from an easily configurable solution for multiple tenant and multiple role environment, so even the most complex organizations and partnerships fit perfectly.

- **Centralize all products and offers**
  Bring a unified approach to product specifications, offers, details and relations using a product catalog solution designed in line with market standards.

- **Integrate with other product catalogs**
  Take advantage of Comarch Product Catalog’s unified interfaces and APIs to set this solution to work as a master enterprise product catalog or as a slave one.

- **Simplify service lifecycle management**
  Make it easy to create, copy, test, approve or retire services. A single entity or larger configuration element can be managed easily throughout the entire lifecycle.
DIGITAL BILLING AND REVENUE MANAGEMENT

- **Ensure flexibility in price and cost management**
  Effortlessly and precisely model even the most complex offers and wholesale agreements.

- **Be ready for global expansion**
  Ensure support for multi-currency, multi-taxation and multi-language functionalities.

- **Deploy single solution for all players in the ecosystem**
  Take unification to a new level, as a CSP, its partners and customers can all use the same solution.
PARTNER MANAGEMENT

- **Manage your digital ecosystem holistically**
  Simplify day to day business processes by taking a single, unified approach within a multi-tenant and multi-currency environment.

- **Adopt a model-driven approach**
  Use the easy to modify configuration stored in Centralized Product Catalog and Party Information Management modules to define how the system and processes work.

- **Prepare for global expansion**
  Take advantage of full global capabilities including multi-currency, multi-taxation and multi-language support.
WHOLESALE BILLING

- **Ensure support for various types of partner settlements**
  Benefit from built-in support for interconnect, roaming (TAP/RAP/NRTRDE/HUR), content with revenue share, MVNO, M2M settlement, signaling and OTT partners.

- **Implement partner management functionalities**
  Manage relations with partners and suppliers, and automate most tasks required for cooperation within the field of telecom interconnect billing.
GLOBAL NETWORK OPERATIONS CENTER

- **Streamline communications**
  With access to Comarch NOC, you have a single point of contact that makes communication easier and more efficient – whatever the issue.

- **Monitor and protect**
  Round the clock monitoring of infrastructure availability and performance lets you detect potential threats early, and prevent them from becoming problems.

- **Optimize resources and cut costs**
  There's no need for the expense of training or hiring specialist technicians, and your own team are freed up to focus on more important tasks.

- **Take control**
  Comprehensive monitoring and insight give you the full picture for strategic planning, and you receive regular reports on your system’s operations.
DIGITIZING ENTERPRISE CUSTOMERS

ENTEPRIZE BILLING, CHARGING & REVENUE MANAGEMENT

Aids even complex corporate billing management, with real-time cost control based on customizable rules, and single invoice creation for all mobile, fixed, hosting and IoT services with multi-branch, multi-department and third-party support.

B2B SELF-ENABLEMENT PLATFORM

Provide mobile and fixed voice, data and VPN services that can be bundled with other solutions. Shows all relevant data, making even complex hierarchies manageable. Full omnichannel support ensures consistent customer experience.

B2B SALES & ORDERING

This proven solution provides a full lead to cash experience within a single package. It ensures accurate, automatic and near-instant quotes which, thanks to the product catalog-driven mechanism, become agreements seamlessly upon approval.
ENTEPRISE BILLING, CHARGING & REVENUE MANAGEMENT

- **Unify invoicing and hub billing**
  Aggregate data from numerous billing solutions to generate a single invoice.

- **Get support for complex company hierarchy**
  Implement multi-branch and multi-department support functionalities.

- **Introduce trial invoicing**
  Take advantage of opportunity to review invoices prior to approval.

- **Benefit from digital invoicing with online data access**
  Get online access to invoices with drill-down analysis possibilities to a single event.

- **Implement split billing**
  Split charges between numerous third parties.
B2B SELF-ENABLEMENT PLATFORM

- **Support customer-manageable complex hierarchies and multiple roles**
  Carry out split billing (for instance, sharing costs between employees and employers). Combine with flexible rules and dashboards for real-time cost control of subscriptions.

- **Implement advanced reporting**
  Guarantee accurate information for business needs with advanced business intelligence solution, numerous pre-configured dashboards and ad hoc reports.

- **Take a model-driven approach**
  Make it easier to introduce new products and services, re-use and bundle, experiment and navigate your business to where the market requires.

- **Go omnichannel**
  Ensure unified, 360-degree view and management possibilities for subscriptions, orders, cases and financial information in traditional and modern digital channels.
B2B SALES & ORDERING

- **Unify sales processes**
  Let a single solution handle entire lead to cash process, using the same entities, continuously enriched as the customer and order capture process progresses.

- **Drive quoting and ordering with product catalog**
  Guarantee bid prices, with quoting and ordering that use the same offers in a model-driven approach enabling re-usability and innovation, and simplifying multi-tenant quotes and orders.

- **Personalize offers and customize pricing**
  Address the needs of VIP customers, especially those in the public sector, who demand offer conditions cut precisely to their requirements. The system also provides tools preventing fraud, including approval processes and customization rules.

- **Manage enterprise frame agreements**
  Take advantage of full support for frame agreements, so negotiated offer terms can be used by a company, its employees and even related firms.
ENHANCING DIGITAL CUSTOMER JOURNEYS

DIGITAL SALES AND CUSTOMER CARE

Comarch Campaign Management offers operators better management of their promotional campaigns and communications and, therefore, improvement in the effectiveness of their marketing activities.

REAL-TIME DATA CONTROL & PRESENTATION

Calculate service charges, improving customer experience with clear, real-time views of bundle consumption, data use, balances and limits. Facilitates reporting with 360-degree customer views, analytical actions, recommendations and personalization.

CAMPAIGN MANAGEMENT

Comarch Campaign Management offers operators better management of their promotional campaigns and communications and, therefore, improvement in the effectiveness of their marketing activities.

LOYALTY MANAGEMENT

Comarch Loyalty Management allows operators to retain and continuously engage customers, and to discover how clients react to loyalty programs.

BUSINESS INTELLIGENCE

Business intelligence helps you by providing a visual representation of data produced from various sources, so you can analyze this information in many dimensions, share it internally and define useful insights to build the company’s competitiveness.
DIGITAL SALES AND CUSTOMER CARE

- **Get a 360-degree customer view**
  Use current and past cost control, digital invoicing and integration with payment providers.

- **Go omnichannel**
  Pick processes most beneficial to your business and place them in your preferred channels, to create customized customer journeys via omnichannel process management.

- **Take advantage of contextualized help**
  Benefit from help engine with chat, chatbots, call center, and spectator mode.

- **Adopt intuitive digital services and a mobile first approach**
  Manage your catalog services, including advanced marketing tools, in few simple steps.
REAL-TIME DATA CONTROL & PRESENTATION

- **Simplify real-time usage and cost control view**
  Get full view of current usage, consumption, and financial data across all channels. Achieve better control over costs, with converged charging, unified rating and balance management.

- **Ensure 3GPP compliance**
  Ensure all your networks and devices are in line with the standards of the top seven standard development organizations, covering cellular telecommunications, radio access, transport network and service capabilities.

- **Be 5G ready**
  Benefit from support for all fixed and mobile networks, and all communication protocols.

- **Enhance scalability and openness**
  Scale up smoothly as your business grows, and take advantage of smooth integration with other Comarch and third-party systems.
CAMPAIGN MANAGEMENT

- **Create effective campaigns**
  Organize multiple simultaneous marketing activities efficiently, view campaigns, manage the stages of each, view the history of changes and enjoy easy access to many models.

- **Target campaigns to subscribers**
  Create target groups aligned with each campaign from the start, and automate the process of creating segments and importing existing groups. Send and track customized offers and promotional codes.

- **Monitor real-time response**
  View real-time information and statistics within one window, and track email campaign conversions on an ongoing basis to ensure that you meet campaign objectives.

- **Get campaign data analytics**
  Aggregate and compare data from different campaigns. Use templates to present shareable reports to decision-makers rapidly. Integrate with Google Analytics or Comarch Smart Analytics.
LOYALTY MANAGEMENT

- **Access full customer insights**
  Create, merge, and manage all customer data based on ID from the BSS system, to ensure you are always up to date with the performance of your loyalty programs.

- **Leverage AI and machine learning to retain customers**
  Identify patterns in your customers’ behavior with AI algorithms based on billing data, and present your clients with offers that match their changing needs.

- **Use gamification to engage customers**
  Turn customers into players by enabling collection of badges based on simple activities and particular achievements to reward them with a special discount or an extra plan.

- **Integrate with new partners quickly**
  Access your partners’ billing configuration and utilize Data Hub streamlining for data exchange processes, thereby reducing the time and cost of integration.

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**COMARCH LOYALTY MANAGEMENT**

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**Touch Points**

- Point of Sale
- E-mail
- SMS
- WWW
- Call Center
- Mobile
- NFC
- Social Media
- Gamification
- E-commerce

**Program Partners**

- Marketing Agencies
- 3rd-party Providers

**Card Producers**

Comarch Loyalty Management Architecture
BUSINESS INTELLIGENCE

- **Unify data from various sources**
  Standardize data from telco systems such as BSS, OSS, assurance, FSM software, and IoT platforms to build a competitive, data-driven organization.

- **Segment data and analyze clients’ behavior**
  Apply various types of segmentation, define insights, and prepare personalized offers for clients. Get visual representation of customers’ value, and analyze churn rate to create strong relationships with clients.

- **Plan and execute 5G rollout coverage**
  Use dashboards to present planned 5G rollout in a specific period of time, and have real-time updates on the planned execution of installed or upgraded sites.

- **Take advantage of reporting as a service**
  Let Comarch experts create, manage and update your business reports to ensure that your telecom data provide insights which help you to meet strategic and operational goals.

- **Be up to date with predictive maintenance alerts**
  Predict and avoid expensive failures thanks to defined equipment parameters sent with IoT smart devices, information based on past events and data from the network hardware environment.
5G NETWORK OPERATIONS

ZERO-TOUCH NETWORK PROVISIONING
A solution to IoT and 5G demands for rapid, automatic implementation of telecom network elements. Comarch Zero-touch Network Provisioning allows devices to be connected, updated, pre-configured and updated.

REAL-TIME OSS – SDN/NFV ORCHESTRATION
The Comarch solution is a platform for provisioning and managing services over VNFs, PNFs and SDN-controlled networks, facilitating comprehensive orchestration of complex multi-domain topologies.

SELF-ORGANIZING NETWORK
Integrating easily with the existing OSS environment, this solution enables network automation for RAN optimization, reducing OPEX, shortening time to market, and improving customer experience.

INTELLIGENT ASSURANCE & ANALYTICS
Comarch Intelligent Assurance & Analytics delivers OSS/BSS analytics, AI and knowledge accumulation for big data analysis, predictive maintenance, and automated incident prevention and resolution.
ZERO-TOUCH NETWORK PROVISIONING

- **Reduce cost of device implementation**
  Configure devices without intervention by a technician. This can reduce costs of device implementation, after which initial configuration, software updates and script execution can be done automatically.

- **Deliver services rapidly**
  Install, then let devices connect to the network, self-configure and activate necessary services, reducing the time needed for service implementation.

- **Fully automate processes**
  Automate the “plan, build, run” process thanks to API integration with resource and process management. Devices can also establish secure connections with other systems using NETCONF and/or RESTCONF.

- **Take a catalog-driven approach**
  Create a library of configuration scripts which can be retrieved and implemented easily per use case, vendor and machine language to achieve significant cost reductions.
REAL-TIME OSS – SDN/NFV ORCHESTRATION

- Make your network context-aware
  Customize your network by varying the level of performance across services, locations, applications or users.

- Deploy services rapidly
  Be the first one to the market by using NFV to make your applications available faster, and then take advantage of SDN to adjust traffic flow and bandwidth to best suit your service.

- Virtualize for security
  Introduce virtual networks to your company and provide the basis for micro segmentation as a security strategy in your data centers.

- Introduce flexible service pricing
  Attract more clients by offering pricing models based on software and license usage.
SELF-ORGANIZING NETWORK

- **Provide a customer-centric network**
  Leverage SON algorithms to manage RANs. Self-healing modules minimize the impact of network failures, and self-optimization algorithms change configuration automatically to raise service quality.

- **Increase return on infrastructure investments**
  Use self-optimization algorithms to let the solution automatically change network configuration to optimize resources. This will allow the MNO to better utilize assets and increase return on investment.

- **Lower the cost of RAN management**
  Automate operational activities to keep down management costs as the RAN network expands, by shifting expert focus from daily operations to strategic, high yield projects.

- **Reduce time to market for network projects**
  Leverage the algorithms provided by SON for self-configuration to automate deployment of new network resources and automate services. This allows faster deployment and reduces provisioning errors.
INTELLIGENT ASSURANCE & ANALYTICS

- **Get AIOps for 5G network**
  Let humans and machines collaborate intelligently to deliver the information required to perform the appropriate actions at the right time.

- **Break the silos**
  Take a holistic approach to telecom assurance processes and break the traditional silos which are decreasing your operational efficiency.

- **Decrease mean time to repair**
  Deploy intelligent root-cause and impact analysis to decrease MTTR significantly, optimize resource utilization and improve customer satisfaction.

- **Introduce policy-based management**
  Unify configuration of all telecom assurance processes, so you can focus on defining strategies instead of performing repeatable operational tasks.
With a modern and innovative OSS portfolio, Comarch has repeatedly demonstrated strong and reliable business partnering with Vodafone. Comarch has provided high quality COTS products, coupled with their impeccable services, to implement solutions on time and within budget, adapting swiftly to new business requirements arising during and after implementation. Considering dimensions such as time to market, quality to market, customer obsession, agility, value and innovation, Comarch is a partner that invariably ticks all of the boxes.

Shane Gaffney
DIRECTOR OF OSS, CENTRAL EUROPE AT VODAFONE
RESOURCES MANAGEMENT

REAL-TIME NETWORK INVENTORY MANAGEMENT
Stores information about physical, logical and virtual network resources in a shared, central inventory facilitating network resource catalog management for multi-vendor, multi-domain networks.

NETWORK PLANNING & DESIGN
Enables CSPs to manage telecom network planning, design and optimization processes comprehensively and efficiently, and to future-proof operations to ensure ongoing customer satisfaction.

NETWORK AUTO-DISCOVERY & RECONCILIATION
Provides live, comprehensive insight into a multi-vendor, multi-domain network, enabling effective network management and supporting reconciliation of RAN, transport, core, access and IT domains.

NETWORK CONFIGURATION MANAGEMENT
Comarch Network Configuration Management enables service providers to automate network provisioning in the radio access network, transmission, core and access domains.

NETWORK CONSOLIDATION FOR M&A
Comarch Network Consolidation for M&A helps telecoms companies organize and streamline network planning and consolidation processes efficiently in merger and acquisition (M&A) projects.
REAL-TIME NETWORK INVENTORY MANAGEMENT

- **Get a comprehensive network view**  
  See equipment and connections in several layers, both technology-specific and generic, for a consistent view of the network.

- **Reduce network operating cost**  
  Increase business efficiency and decrease operational costs with a single network view.

- **Improve resource utilization**  
  Use existing resources efficiently, and plan new ones which are profitable from the business perspective.

- **Assure efficiency**  
  Get network assurance system support with topological correlations for recognizing and troubleshooting the root cause of failures.

- **Integrate in umbrella OSS**  
  Reduce operational costs and raise processing efficiency, with OSS system that provides data for all other modules.

- **Innovate**  
  Create umbrella OSS for new virtual and legacy architectures, thanks to integration with the SDN/NFV framework for inventory, planning, configuration and assurance.
NETWORK PLANNING & DESIGN

- **Increase agility with process-driven network inventory**
  Implement business process management and automated task distribution using process flows and rules to increase agility.

- **Get a complete network view**
  Get accurate and detailed network view showing logical, virtual and physical resources at a glance.

- **Implement umbrella OSS**
  Benefit from pre-integration with SDN/NFV framework for inventory, planning, configuration and assurance.

- **Innovate and evolve**
  Let new and legacy architectures operate together, giving technicians advanced network management tools.

- **Ensure integrated assurance**
  Synchronize data and alarms with SQM/CEM to enable SON integration and quality-driven optimization.

- **Lower OPEX**
  Integrate tools into one ecosystem featuring automated synchronization mechanisms.

- **Lower CAPEX**
  Improve coordination of co-dependent network-related processes for CAPEX optimization.

- **Decrease time to market**
  Monitor efficiency using unified project procedures and configurable reports, and reduce time to market.
NETWORK AUTO-DISCOVERY & RECONCILIATION

- **Get a comprehensive, live network view**
  Get up to date insight into the multi-vendor, multi-domain network thanks to Comarch Mediation Layer.

- **Automate auto-discovery & reconciliation processes**
  Automate the discovery and resolution of discrepancies between inventory data and the real network, with rule definition for complex scenarios.

- **Reduce time to market**
  Shorten upgrade and optimization cycles by providing almost immediate configuration update feedback from the network.

- **Simplify the provisioning process**
  Intervene manually when required, thanks to pre-integration with Comarch OSS Process Management.

- **Improve customer experience**
  Choose pre-integration with Comarch Network Planning & Design to implement the plan, upgrade, verify, re-plan process to shorten the time needed to provide good customer experience.

- **Implement umbrella configuration management integrated with SON**
  Eliminate provisioning errors thanks to automatic recognition and resolution of conflicts between plans.

- **Reduce costs by migrating to a single OSS tool**
  Decommission and migrate legacy systems into Comarch OSS Suite, to make cost savings.
NETWORK CONFIGURATION MANAGEMENT

- **Facilitate multi-vendor and multi-domain configuration**
  Enable multi-vendor, multi-domain network configuration with mobile and fixed network support.

- **Simplify provisioning**
  Hide the complexity of vendor-specific network configuration management and automate network planning to vendor-specific reconfiguration.

- **Improve customer experience**
  Choose pre-integration with Comarch Network Planning & Design to implement the plan, upgrade, verify, re-plan process to shorten the time needed to provide good customer experience.

- **Make yourself future-proof**
  Ensure extendibility for future network technologies thanks to flexible and template-based design.

- **Facilitate umbrella configuration management - integrated with SON**
  Eliminate network provisioning errors, with automatic recognition and resolution of conflicts between plans.

- **Reduce costs**
  Decommission and migrate legacy systems into Comarch OSS Suite, to make cost savings.

- **Integrate configuration management with SDN**
  Get support for configuration of a standard IP network and integration with SDN controller.
NETWORK CONSOLIDATION FOR M&A

- **Plan the network**
  Let Comarch migrate and operate on data from both sides of the M&A process, isolating sensitive information until the merger is approved.

- **Customize network planning workflows**
  Easily configure business processes for orchestrating the target network planning workflow.

- **Get a consistent view of network planning processes**
  Browse radio and transport network activity, see the network from a geographic perspective and measure progress and consolidation outcomes with configurable KPIs.

- **Synchronize with other OSS tools**
  Synchronize all M&A activities managed within the solution with legacy OSS tools, thanks to a built-in mediation module.

- **Plan any network in any technology**
  Get support for all radio technologies (2G/3G/4G) together with market-used logical and physical transport layers.

- **Easily extend to other Comarch OSS modules**
  Add capabilities from Comarch OSS Suite as your requirements change.

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Comarch Acting as a Trusted Third Party in a Network Consolidation Process
INTELLIGENT ASSURANCE & ANALYTICS

AI CONTROL DESK

Comarch AI Control Desk delivers supervised machine learning for automated situation detection, problem detection, baseline generation and anomaly detection, and knowledge accumulation.

CUSTOMER EXPERIENCE MANAGEMENT

Links service monitoring and quality management, providing an insight into customers’ perceptions of services to help network providers switch from network-centric operations to customer-focused ones.

SERVICE QUALITY MANAGEMENT

Comarch Service Quality Management facilitates customer-centric quality management, letting you prioritize network performance management to deliver high-level customer service assurance.

SERVICE MONITORING

Events from fault management, service quality management and performance management are correlated in Comarch Service Monitoring and presented graphically for rapid insight into the network situation.
AI CONTROL DESK

- **Introduce AIOps**
  Let humans and machines collaborate intelligently to deliver the information required to perform the appropriate actions at the right time.

- **Supervise AI/ML**
  Allow sophisticated correlation rules to use data from many sources to trigger automated actions and reduce manual ticket processing by up to 90%.

- **Automate service assurance**
  Set the data update frequency, define the file formats and other parameters to adapt to business requirements.

- **Accumulate knowledge**
  Embed your operational team’s knowledge in the system in a formalized manner which can be used by ML algorithms to increase operational efficiency.
CUSTOMER EXPERIENCE MANAGEMENT

- **Improve problem solving efficiency and protect your revenue**
  Obtain the information and drill-down capabilities to speed up troubleshooting and decrease mean time to repair. Use built-in self-healing capabilities, prioritize your incidents and solve problems quickly.

- **Personalize your offers**
  Understand telecom customer behavior and be proactive in providing your clients with offers that are tailored to their needs. Personalization improves customer satisfaction, increases loyalty and decreases churn rate.

- **Improve customer satisfaction**
  Measure your customers’ quality of experience and optimize service performance in line with what they expect. Identify and eliminate problems perceived by your customers increase satisfaction and reduce churn.

- **Gain extra knowledge and expand your business**
  Use the solution to identify new potential revenue streams and leverage big data capabilities to launch new products, build partnerships or provide new services, helping your business expand in size and value.

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### CEM Use Cases

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Examples:

- Annoyed customers hot-spots
- Indoor problems
- Mobile traffic detection
- Traffic routes
- Transport analytics
- Browsing performance

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SERVICE QUALITY MANAGEMENT

- **Get a holistic view of services**
  Define service models and use them to monitor interdependencies between your customers, services and network.

- **Be proactive with predictive maintenance**
  Utilize machine learning algorithms to automatically define baselines and detect anomalies.

- **Integrate KQs with intelligent event processing**
  Embed threshold-crossing events generated by your SQM into end to end processing of events arising from different sources.

- **Monitor 5G and IoT services**
  Efficiently monitor new services implemented using 5G and IoT technologies.
SERVICE MONITORING

- **Monitor services on any network**
  Monitor and manage the quality of digital services on heterogeneous multi-vendor, multi-domain networks and delivery platforms serviced by partners.

- **Prevent customer service degradation**
  Be proactive in preventing customers from experiencing service quality deterioration, with early alerts about potential incidents.

- **Prioritize based on customer and business impact**
  Distinguish between the different impact that similar network KPIs may have on service level and customer experience.

- **Automate impact analysis and enhance root-cause analysis**
  Resolve customer incidents rapidly by automating impact analysis and improving root-cause analysis by drilling down into events that impact services.
SERVICE DESIGN & FULFILLMENT

SERVICE CATALOG
Comarch Service Catalog defines service rules and enables the centralization of service specification management, with the goal of further automating fulfillment and assurance processes.

SERVICE INVENTORY
End to end management of network and related products from the service perspective. Integrates with other Comarch modules to facilitate a comprehensive network, service and product view, simplifying management of all these aspects.

SERVICE FULFILLMENT & ORCHESTRATION
A catalog-driven solution designed to reduce time to market and automate service fulfillment for customer service delivery on top of a hybrid network. Enables seamless orchestration of virtual and physical network functions and services.

FIELD SERVICE MANAGEMENT
A system supporting service order placement, scheduling, technician assignment, route optimization, equipment allocation and management of service level agreements and reports, to reduce operating costs and improve customer experience.
SERVICE CATALOG

- **Reduce time to market**
  Define products from the business and technical perspectives, supporting an automated order to cash process.

- **Lower operational costs**
  Centralize and automate service management for fulfillment and assurance processes.

- **Improve customer experience**
  Define rules for service monitoring and quality management to raise the level of customer experience management.
SERVICE INVENTORY

- **Get a comprehensive network view**
  See resources required for services, and identify the services supported by a given network element.

- **Connect networks and services**
  Eliminate the gap between business/customer-centric views and technical infrastructure to control development and maintenance costs.

- **Save time on service delivery and cut costs**
  Ensure faster, less expensive new service delivery and service fulfillment automation.

- **Improve customer experience**
  Improve service monitoring and quality management to raise the level of customer experience.

- **Drive automation**
  Store information about new services, and view details of existing ones to enable the execution of service orders.

- **Enhance service quality management**
  Calculate the impact of network-related problems on customer services, and enable alarm propagation and KPI/KQI monitoring for quality management processes.

- **Optimize network planning**
  Get information about network resource service utilization for network planning and upgrading processes.
SERVICE FULFILLMENT & ORCHESTRATION

- **Deliver services based on hybrid networks**
  Benefit from SDN/NFV technology combined with a legacy network to deliver new services and embrace the “fail fast” concept.

- **Use VNFs as components for service creation**
  Automate on-boarding and adaptation of VNFs and network services, then use them to model customer services via the service catalog module.

- **Increase creativity**
  Define new services without needing in-depth technical or scripting knowledge. Accelerate service creation and flexibility, and incorporate partners’ services.

- **Improve time to market**
  Launch and deliver offers by building services from pre-defined components managed in the service catalog.

- **Align service offers with network capabilities**
  Focus on integrated product & service catalogs to deliver a true customer-centric offer.

- **Increase efficiency and cut costs**
  Cut the costs of service launch, delivery and provisioning, and unlock the capability to integrate third-party services.
FIELD SERVICE MANAGEMENT

- **Optimize costs with process automation**
  Benefit from well-informed task assigning and route planning.

- **Cut level of paper and phone usage**
  Ensure mobile access for technicians in remote locations.

- **Reduce dispatcher workload**
  Free up resources with Automatic Dispatcher module and order completion reporting performed directly by service technicians.

- **Maximize field workforce productivity**
  See the benefits of improved time and resource management.

- **Limit number of unsuccessful truck rolls**
  Ensure technicians have access to all required data in the FSM Mobile.

- **Increase the number of visits for higher revenue**
  Carry out a higher number of installations per day, and complete the service activation process in real time.

- **Boost field sales**
  Let field service operatives implement up-sell and cross-sell offers to customers.

- **Raise level of customer satisfaction**
  Keep clients happy with greater service efficiency.

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**Field Service Management Features**

- Effective Planning and Scheduling
- Field Service Empowerment
- Third-party Workforce Management
- Site Access Management
- Mobile Workforce Management
- Customer Service
- Corrective, Preventive and Predictive Maintenance
- Data Integration, Reporting and Forecasting
I am confident that Comarch solutions will enable MTS to accomplish the transition from a network-centric towards a customer-centric OSS ecosystem, with the ultimate goal of creating the best customer experience.

Andrey Ushatsky
VICE-PRESIDENT AND CHIEF TECHNOLOGY OFFICER, MTS
IOT CONNECT

IOT SOLUTION MANAGEMENT
Comarch IoT Solution Management helps businesses function in today’s IT world. It includes comprehensive support for selling, storing and managing IoT connectivity services, devices and applications.

IOT CONNECTIVITY MANAGEMENT
Comarch IoT Connectivity Management enables mobile operators and IoT service providers to provide managed connectivity in multi-national, multi-level and multi-operator environments.

IOT ANALYTICS PLATFORM
The IoT Analytics Platform module focuses on delivering measurable business value, using intelligent big data processing and real-time data analytics for M2M/IoT business purposes.

IOT BILLING
IOT SOLUTION MANAGEMENT

- **Manage a comprehensive IoT sales catalog**
  Create IoT solutions to connect devices and applications, import models and device types, and create offers to meet the needs of businesses and their customers.

- **Store an inventory of various IoT device types**
  Manage, deliver and monitor all physical devices, from simple nodes and complex sensors to multimode intelligent IoT gateways, using this Comarch solution.

- **Use device and vertical-specific pricing**
  Adapt your pricing model to any vertical, charge for device counters, define device lending/selling models, and set connectivity pricing in the background.

- **Control contract management**
  Complete the quote lifecycle with a contract that can be sent to customers and stored in the system. Amend the contract if required, and generate and manage voucher codes.

- **Open your ecosystem to the IoT**
  Use IoT Portal and IoT Marketplace to expose IoT Services to your customers and partners, sell IoT solutions and enable vertical applications with single sign-on feature.
IOT CONNECTIVITY MANAGEMENT

- **Ensure M2M/IoT connectivity**
  Handle and manage all SIM types, monitor services and react in real time to any connectivity issues.

- **Get a scalable solution**
  Upgrade as your business grows. Handle any service, transaction and pricing model.

- **Increase efficiency of IoT operations**
  Receive live notifications on data-use browsing, reports, diagnostics and bulk operations via multi-language self-care.

- **Monitor costs**
  Integrate with your existing environment to facilitate automatic KPI/cost data processing.

- **Shorten time to market in IoT**
  Use bulk operations to deliver IoT services with automated provisioning and order management.

- **Control IoT equipment and services**
  Trigger actions automatically and deliver bandwidth and QoS-controlled services.

- **Be a real-time provider**
  Collect all billing and usage data instantly, and bulk-manage IoT SIMs.

- **Communicate more efficiently**
  Build personalized, flexible IoT offers and tariffs combining bundles in pre- and post-paid mode.
**IOT ANALYTICS PLATFORM**

- **Measure business value with real-time IoT data processing**
  Gather, process and combine real-time and historical data to see the services your customers use, so you can measure the value of your IoT business.

- **Achieve operational excellence**
  Analyze how services are being used, track device performance and visualize equipment movement, to improve services, reduce inefficient usage and propose service changes to meet customer needs.

- **Improve your IoT services through analytics**
  Combine IoT analytics data with information from BSS/OSS and vertical applications to build a complete view of the service and understand how to tailor it to your customers’ needs.

- **Offer highest quality of IoT Service with various-level SLAs**
  Manage different SLA levels in your IoT operations to deliver on QoS. Discover patterns and trends, see device issues, and report and analyze anomalies with user dashboards.

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**Comarch IoT Analytics Platform Architecture**

[Diagram showing the integration of various components such as Network Connectivity, M2M/IoT Devices, Existing Systems (Vertical Apps, Application Enablement Platform, Customer Information, Maps), and the platform's reporting, data management, and processing capabilities.]

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**IOT BILLING**

- **Bundle IoT services with different pricing models**
  Create bundled services with CSPs, device providers, third parties and resellers, using value-based, criteria-based and device-based models.

- **Offer high-quality IoT service billing**
  Enhance user experience with swift and efficient invoicing, and 24-hour support across entire bill runs. Implement reporting, automated alerts and notifications.

- **Deliver IoT services to verticals**
  Create and tailor services for specific verticals and organizations, charging intelligently for the use of the IoT service and not only for data/SMS volume.

- **Control money flows**
  Use up to date, automatically generated financial documents within multi-party IoT services. Control full service delivery and browse financial reports, invoices and settlements.

- **Ensure billing accuracy with real-time data processing**
  Gather and process data from a network, IoT devices, applications and other sources in real time. Charge mixed, pre or post-paid to deliver value to any vertical.

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**Comarch IoT Billing Architecture**

- **Operator - Billing Manager**
- **Comarch / Operator - Operations**

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**Existing Systems**

- DWH
- Accounting
- Logistics

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**Network**

- **Connectivity**
- **M2M/IoT Devices**

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**Comarch IoT Billing**

- **Billing & Rating**
  - Product & Tariff Management
  - Rating & Process Management
  - On-line Charging
  - Invoicing
  - Payments
  - Dunning

- **Service Control**
  - AAA
  - Service / Limit / Fraud Control
We chose Comarch because their existing product portfolio provided a good basis for the platform. More importantly, Comarch was able to prove their ability to quickly develop custom features upon request. We believe that, in dynamically growing markets, flexibility and customer orientation are the keys to success. The set-up we have chosen with Comarch helps us deliver just that.

Phat Huynh
MANAGING DIRECTOR, HEAD OF MARKETING & SALES
TELEKOM AUSTRIA GROUP
IOT ECOSYSTEM

IOT CONNECT
Comarch IoT Connect and related products combine as a platform for handling devices, assets, networks and data across the entire telco IoT business and in related vertical sectors.

SMART PARKING
Comarch Smart Parking allows you to create a smart city offer for local government. Its main function is to search for available parking spaces and send updates about them to drivers using a mobile application.

SMART LIGHTING
An intelligent lighting management system enabling operators to create a complete smart city offer for local authorities. The system allows remote effective management of lamps' energy consumption and advanced analytics.

SMART METERING
An intelligent measurement system which enables remote reading of water, gas, heat and electricity meters, as well as early detection of anomalies such as leaks, violations, and security alerts.

MOBILE HEALTHCARE FOR TELECOMS
Comarch Mobile telemedicine devices and applications enable continuous remote monitoring of patients' health, with data sent to doctors and caregivers in real time.
IOT CONNECT

- **Make IoT service quality matter**
  Monitor your SIMs and services with automated control rules and actions, react before customers experience problems.

- **Empower your IoT partners**
  Let verticals manage their own services, so they can deliver device, connectivity and app bundles to their customers.

- **Improve customer value**
  Charge in real time for the IoT services that customers actually use.

- **Analyze IoT services in real time**
  Analyze services graphically – including usage, movement, trajectories, customer behavior and much more.

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Comarch IoT Connect

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**Comarch IoT Connect**

**Comarch IoT Connectivity Management**
- Customer & Partner Management
- Resource Management
- Usage Store and Service Management
- Service Activation
- Application Integration Framework

**Comarch IoT Analytics Platform**
- Data Processing
- Data Management
- Reporting & UI

**Comarch IoT Billing**
- Billing & Rating
- Service Control

**Comarch IoT Solution Management**
- IoT Market Place
- Contract Management
- IoT Solution Catalog
- Device Inventory

**Existing Systems**
- DWH
- Accounting
- Logistics
- Vertical Apps
- Application Enablement Platform

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Comarch IoT Connect

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**Network**

**Connectivity**

**M2M/IoT Devices**
SMART PARKING

- **Offer image recognition technology**
  Become a trusted partner for cities by offering parking space monitoring based on IP cameras and modern intelligent video analysis (IVA) algorithms.

- **Ensure camera delivery and installation**
  Create a complete offer for local authorities by ensuring both delivery and professional installation of IP cameras in parking spaces.

- **Use our experience in data integration**
  Take advantage of our knowledge of standards and integrations with billing, customer care systems, reporting and analytical systems.

- **Optimize parking space occupation**
  Enable monitoring of parking space occupancy, identification of peak hours, predicting future traffic and even defining driver behavior.
SMART LIGHTING

- **Create smart city offer for local authorities**
  Ensure cities can activate/deactivate lamps where necessary and manage light intensity with this intelligent system installed in the lamp holder.

- **Ensure cost savings for local governments**
  Enable local authorities to make considerable cost savings on electricity, maintenance and lamp management by offering a new, intelligent way to manage lighting.

- **Provide hardware, software and integrations to your clients**
  Create a complete offer by ensuring that Comarch delivers lamp hardware, software and necessary integrations for the smooth implementation of the smart lighting system.

- **Monitor data in the cloud**
  Provide the possibility to measure and analyze electricity consumption or detect sudden power surges by processing all data in the cloud.
SMART METERING

- **Generate new revenues from the utility sector**
  Earn by not only providing connectivity between devices and the IoT platform, but mostly by providing an end to end solution to suppliers of many different utilities, including water, gas, heat and electricity.

- **Bring real value to your customers**
  Give your customers access to data that will enable them to counteract leaks and anomalies, reduce costs and manage resources effectively.

- **Improve efficiency and optimize costs**
  Give your organization the possibility to improve utilities usage and reduce costs.

- **Trust a reliable IoT solutions provider**
  Take advantage of Comarch’s experience in data integration with systems that are associated with other IT solutions. Integrate Comarch Smart Metering based on the Comarch IoT Platform with other cloud solutions.

- **Extend the possibilities with other Comarch products**
  Extend the offer with additional Comarch systems such as FSM and Predictive Maintenance, which enable your partners to manage failures, schedule maintenance visits, and order repair tasks more accurately, in accordance with the agreed SLA.

- **Deliver services based on universal technology**
  Use Comarch Smart Metering, which follows industry standards such as Narrowband-IoT and LTE Cat M1 to ensure full compatibility with telecommunication and utilities infrastructure.

- **Select an end to end solution**
  Choose a product completely developed by Comarch, from R&D to prototyping at our IoT Plant and post-integration software development. Ensure top quality and reliability for your partners.
MOBILE HEALTHCARE FOR TELECOMS

- **Extend your service portfolio with healthcare innovations**
  Partner with healthcare industry representatives and expand your client base by providing connectivity to innovative devices for remote health monitoring.

- **Enable provisioning of healthcare services to remote locations**
  Be a part of changing the homecare landscape by ensuring that each patient, even in remote locations, can take a more proactive role in their own healthcare.

- **Ensure continuous information exchange between doctors and patients**
  Use the connectivity capabilities to ensure that patients and doctors gain access to personal health records, and are enabled to use instant messaging, real-time alerts, and notifications.

- **Use our know-how in complex integrations**
  Shorten the time to market by leveraging Comarch experience in implementations in the telecommunication and medical industries.
CLOUD & SECURITY

CLOUD DATA STORAGE AND BACKUP

Comarch IBARD is a professional all-in-one cloud service for storage, backup and file sharing, ensuring the highest level of data security. The product is sold in white label model so resellers can extend their portfolio for private and business clients.

CLOUD INFRASPACE (IaaS, PaaS)

Make the most of this ready-to-use platform managed by its clients. It delivers basic computing architecture of a fully outsourced, on-demand service in the form of many servers, high computing power, an operating system, network, and storage services.

MULTI-CLOUD MANAGEMENT SERVICES

Help telecoms achieve the full benefits of multi-cloud ecosystems with our capabilities to centralize and manage multiple cloud platforms - private, public, hybrid, third-party public, hosted private or non-cloud infrastructure, all from one place.

CYBER SECURITY

Comarch Identity & Access Management (CIAM) combines the functions of Identity Management and Access Management systems. It allows full control over access to a company’s applications, workstations and VPNs.

CLOUD SUBSCRIPTION BILLING

Comarch Cloud Subscription Billing enables simple management of customers, their contracts, recurring billing and related processes for subscription-based businesses.
CLOUD DATA STORAGE AND BACKUP

- **Perform reliable data backups**
  Offer your clients an intuitive and flexible backup scheduler wizard, so they can backup files and databases at a given time and frequency.

- **Secure data storage with file encryption**
  Allow your clients to store files in the cloud with Comarch IBARD, and to secure them with their own encryption key.

- **Share your data securely**
  Facilitate file transfer and sharing without the risk that data will get into the wrong hands, and let clients manage access between themselves and their partners.

- **Synchronize data**
  Enable your clients to keep required documents to hand. With Comarch IBARD, files can be accessed and edited on mobile devices, with changes updated in real time.
CLOUD INFRASPACE (IaaS, PaaS)

- **Avoid hidden costs**
  Take advantage of clear and transparent pricing of cloud services, with no hidden costs or elements difficult to predict when choosing the plan. Change the plan when you need to.

- **Limit operational and investment costs**
  Cut operational costs with our cloud services. Save from 50 to 80% on operational costs, depending on your line of business. Avoid high investment costs, as no additional hardware needs to be set up.

- **Benefit from infrastructure ready for telecom systems**
  Choose a platform that is prepared with telco needs in mind and ensures that integration with BSS, OSS, IoT and FSM systems goes smoothly.

- **Scale your business as you please**
  Benefit from our easily configured infrastructure that meets your business requirements and lets you transform your business to a cloud model in no time.

- **Secure your data**
  Use the cloud to its full potential without worrying about business security. Use high-end risk prevention mechanisms and the latest encryption methods to keep your data secure.

- **Ensure great reliability**
  Don’t worry about the possible destruction of your servers, or delays due to natural disasters or sudden overloads. Thanks to cloud solutions, you are guaranteed the stability of services in unpredictable circumstances.
MULTI-CLOUD MANAGEMENT SERVICES

● Use one portal to manage multiple cloud services
  Choose cloud services from various vendors, and centralize different architecture platforms to achieve your business goals.

● Optimize cloud costs
  Create a mix of cloud services to fit your budget and performance needs. Adjust cloud service models to your core business and less vital processes to optimize the total cost of cloud solutions.

● Improve reliability
  Use passive cloud as a failover solution when the primary service goes down, and automatically revert when the primary cloud works.

● Optimize workload distribution
  Create a “single pane of glass” to ensure a holistic view of available and utilized resources, and enable optimal workload scheduling and scaling.

● Enhance data security
  Set consistent security policies across environments, and manage workloads following the procedures.

● Increase automation
  Orchestrate cloud services and move workloads between them to avoid manual interventions and ensure the required flexibility and scalability.
CYBER SECURITY

- **Authenticate and authorize users**
  Enable aggregation of all services related to user authentication and authorization data validation.

- **Take advantage of role-based access control**
  Simplify user management and ensure high flexibility by aggregating permissions from different applications.

- **Improve identity control**
  Allow management of all user identities and ensure appropriate people have access to the required resources at specific times and for specific reasons.

- **Ensure access management**
  Enable access to systems and resources across the entire enterprise, based on the appropriate level of user permissions.
CLOUD SUBSCRIPTION BILLING

- **Manage billing operations**
  Rate, charge and bill for delivered services, ensuring revenue streams. Take advantage of invoicing, dunning, and payment functionalities to make sure that your business is financially stable.

- **Keep client contracts in one place**
  Store contract-related information in one system. Perform all required contract-related operations within a single process. Keep customer contracts on their accounts.

- **Manage collections**
  Secure your company’s revenues by effective collection management. Use dunning management functionality for multi-stage collection management, and reduce business risks.

- **Use out of the box features**
  Avoid unnecessary integrations and paying for other systems. Use all-in-one software including features such as a selfcare web application, CRM for customer support, product catalog configuration, system administration and reporting. Integrate other systems with our API when necessary.
PROFESSIONAL SERVICES

BUSINESS CONSULTING
Comarch helps CSPs and technology vendors to optimize and automate business processes and increase efficiency by eliminating redundancy and rethinking IT architectures and configurations.

MANAGED SERVICES
Comarch Managed Services can help your company achieve an OPEX reduction of up to 50%, and improve the time to market for new services, technology rollouts, device and infrastructure integration.

BSS/OSS TRANSFORMATIONS
Comarch offers a comprehensive portfolio of products and services designed to support local and multi-country transformations for businesses of all sizes in both the BSS and OSS domains.

CLOUD TRANSFORMATION
Comarch’s IT solutions for telecoms benefit from agile, microservice-based architecture that ensures full automation of platform integration and delivery, rapid deployment, and cloud-readiness.

END TO END PROJECT DELIVERY
Helps CSPs transform service and network management using automation. Assures orchestration of a domain-specific orchestrator, so each domain provides sub-services needed to deliver customer service.
BUSINESS CONSULTING

● **Benefit from the know-how of BSS/OSS experts**
  Let Comarch support your transformation in the areas of: Sales & Customer Management, Convergent Charging & Billing, Service Design & Fulfillment, Network & Service Assurance, Resource Planning & Inventory, as well as new business areas such as SDN/NFV, IoT, M2M and Data Analytics.

● **Achieve maximum business results**
  Set the data update frequency, define the file formats and other parameters to adapt to business requirements.

● **Break down operational barriers**
  Personalize the parameters and communicate with your business partners through a secure channel. Sort your data (usage, billing etc.) and define all service and data accesses for each business partner.
MANAGED SERVICES

- **Get measurable results**
  Define KPIs and KQIs that will help you achieve your project goals.

- **Offer highest level of service**
  Benefit from monitoring, measuring, reporting and reviewing of SLAs against SLTs.

- **Manage incidents efficiently**
  Get services restored as soon as possible after any incident, minimizing the impact on business operations.

- **Outsource infrastructure and hosting**
  Comarch Data Centers offer SaaS and IaaS implementation models.

- **Outsource business processes**
  Comarch can take responsibility for business processes and implement operational tasks.

- **Migrate to new BSS/OSS seamlessly**
  Benefit from seamless migration, from black box outsourcing to fully managed processes.

- **Get specialist support**
  Enjoy Comarch’s SaaS and BPO services guarantee of quality, in the knowledge that all personnel are ITIL v3 certified.

- **Get single point of contact with 24/7 support**
  Take advantage of 24/7 access to a dedicated service desk that handles all incidents and requests.
BSS/OSS TRANSFORMATIONS

- **Consolidate BSS/OSS to save time and money**
  Optimize network/resource management and business processes related to technology rollouts and current market needs.

- **Optimize product and customer management**
  Manage product portfolio and customer-related processes across multiple locations in a unified, optimal and cost-effective manner.

- **Generate new revenues from existing assets**
  Implement new models, while securing your company’s independence in the value chain and ensuring monetization of assets.

- **Pave the way for tomorrow’s technologies**
  Leverage the capabilities of your BSS/OSS infrastructure to support the latest technologies.

- **Consolidate**
  Shorten time to market and boost service innovation with a central product and service catalog. React to customers in real time and create new services rapidly.

- **Benefit from managed services**
  Move part of the responsibility for your transformation’s success to Comarch, saving time and money.
CLOUD TRANSFORMATION

- **Don’t move your data**
  Retain pre-existing SaaS and PaaS models while still benefiting from the convenience of the cloud-ready solution.

- **Deploy new services quickly**
  Re-use network configuration to make the addition of new value-added services a matter of simply defining pricing models and content.

- **Integrate easily**
  Integrate smoothly with third-party software including social media, IP-based messengers, analytics and BI tools, IN and IoT platforms, and OTT services.

- **Find new revenue streams**
  Use telco cloud platform openness to allow operators to access new revenue sources and manage content with OTT providers in revenue-sharing models.

- **Raise capacity intelligently**
  Speed up deployment, simplify automated testing, and facilitate a swift response to temporary network utilization peaks.

- **Lower OPEX**
  Improve automation and reuse configuration patterns and operations teams by allowing them to work from the same cloud platform.
END TO END
PROJECT DELIVERY

- **Get full post-sales support**
  Get help from our experts with any system maintenance issues, and benefit from full support in person or over the phone.

- **Outsource third-party management**
  Take advantage of Comarch’s experience with third-party companies as integration and technology partners, or select your own.

- **Get a tailored solution**
  Let us examine systems, business processes and organizational issues to establish the best way to reach the desired outcome.

- **Share responsibility for managing project risks**
  Let Comarch shoulder some of the risk of a project via its own tools and risk management methodologies or those of its partners.

- **Don’t tackle issues alone**
  If you need advice, ask. We are always there to help you get the most out of your new solution, even after the go-live phase.

- **Get professional training**
  Benefit from Comarch training services, addressed to those engaged in system implementation, project managers, end users as well as system administrators and trainers.
We were very impressed by Comarch’s highly responsive and flexible attitude, as well as their coverage of our current and future needs. Telecom operators that want to stay competitive in today’s market need to deliver top-notch customer experience and provide personalized, data-driven services through all touchpoints. It is also crucial to manage all operational aspects by decreasing the number of incidents, improving response rates, and increasing efficiency through automation focused on added value activities. In partnership with Comarch, we aim to complete a very sizeable project that will affect and transform all aspects of our BSS operations, ranging from prepaid charging and credit control to customer information management, mobile network provisioning, and trouble ticketing. Based on what we have seen so far, we are very hopeful and optimistic about the outcomes of the project.

Werner De Laet
CEO AT ORANGE LUXEMBOURG
SUCCESS

CHAPTER II
### COMARCH TELECOM CUSTOMERS

#### TELECOMS OPERATING WITHIN INTERNATIONAL GROUPS

<table>
<thead>
<tr>
<th>CUSTOMER</th>
<th>IMPLEMENTATION SCOPE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Telekom Deutschland</strong> telekom.de</td>
<td>End-to-end view of services with integrated resource and service layers thanks to Comarch Resource &amp; Service Inventory.</td>
</tr>
<tr>
<td><strong>T-Mobile (formerly GTS)</strong> t-mobile.pl</td>
<td>Convergent billing for improved billing processes and shorter time to market for new services.</td>
</tr>
<tr>
<td><strong>T-Mobile Poland</strong> t-mobile.pl</td>
<td>Full automation of fault management tasks, including correlation and handling trouble tickets.</td>
</tr>
<tr>
<td><strong>E-Plus, now owned by Telefónica Germany</strong> telefonica.de/e-plus-gruppe</td>
<td>Transformation of network planning and design processes with Comarch OSS.</td>
</tr>
<tr>
<td><strong>Telefónica Global</strong> telefonica.com</td>
<td>Improved efficiency of network planning and optimization processes in five Telefónica subsidiaries in Latin America.</td>
</tr>
<tr>
<td><strong>Telefónica O2 Deutschland</strong> telefonica.de</td>
<td>Better control of network operations with transport network management &amp; configuration, fault and performance mediation.</td>
</tr>
<tr>
<td><strong>Vodafone Group</strong> vodafone.com</td>
<td>Fault management, service monitoring and performance management multi-tenant solution and tools for a single Vodafone Global NOC, managing the operator’s networks in several countries.</td>
</tr>
<tr>
<td><strong>Vodafone Germany</strong> vodafone.de</td>
<td>Integrated Assurance &amp; Analytics for mobile, fixed and cable networks &amp; services in Vodafone Germany, including Vodafone Kabel Deutschland.</td>
</tr>
<tr>
<td><strong>VF Kabel Deutschland</strong> kabel.vodafone.de</td>
<td>Switching to process-driven infrastructure and network management, with centralized inventory management and planning.</td>
</tr>
<tr>
<td>Company</td>
<td>Website</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Orange Luxembourg</td>
<td>orange.lu</td>
</tr>
<tr>
<td>Orange Poland</td>
<td>orange.pl</td>
</tr>
<tr>
<td>X by Orange</td>
<td>xbyorange.com</td>
</tr>
<tr>
<td>ngena</td>
<td>ngena.net</td>
</tr>
<tr>
<td>A1 Telekom Austria Group</td>
<td>a1.group</td>
</tr>
<tr>
<td>A1 Belarus</td>
<td>a1.by</td>
</tr>
<tr>
<td>STC</td>
<td>stc.com.sa</td>
</tr>
<tr>
<td>Thales Alenia Space</td>
<td>thalesgroup.com</td>
</tr>
<tr>
<td>MTS</td>
<td>ir.mts.ru</td>
</tr>
<tr>
<td>Telenet Group</td>
<td>telenet.be</td>
</tr>
<tr>
<td>Bité Group</td>
<td>bite.lt</td>
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</tbody>
</table>
# FIXED AND MOBILE, TRIPLE AND QUADPLAYERS

<table>
<thead>
<tr>
<th>CUSTOMER</th>
<th>IMPLEMENTATION SCOPE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Arqiva</strong></td>
<td>Support for development of next-generation smart metering services thanks to Comarch OSS &amp; assurance products combined with Managed Services.</td>
</tr>
<tr>
<td><strong>dtms</strong></td>
<td>New sophisticated billing system extending the supply chain with separate pricing of services for individual customers.</td>
</tr>
<tr>
<td><strong>Golden Telecom</strong></td>
<td>Support for data mediation and interconnect settlements.</td>
</tr>
<tr>
<td><strong>KPN</strong></td>
<td>Integrated BSS system for large enterprises and corporates, leading to streamlined KPN customer experience, reduced costs and minimal investment risks.</td>
</tr>
<tr>
<td><strong>LG U+</strong></td>
<td>Support in launch of the world’s first 5G network with the help of Comarch products from the Operations Support Systems and Intelligent Assurance &amp; Analytics range.</td>
</tr>
<tr>
<td><strong>Megafon</strong></td>
<td>Improving the Efficiency and Quality of Field Operations with Comarch Field Service Management.</td>
</tr>
<tr>
<td><strong>Netia</strong></td>
<td>Delivery of system handling interconnect agreements, covering current and future needs. Implementation of Comarch Fault Management for reduced risk of network failures and improved service quality for customers.</td>
</tr>
<tr>
<td><strong>Networks!</strong></td>
<td>Support for Orange and T-Mobile infrastructure-sharing initiative in Poland – planning and optimization of the “golden grid” network.</td>
</tr>
</tbody>
</table>

*Go to table of contents*
<table>
<thead>
<tr>
<th>Company</th>
<th>Website</th>
<th>Country</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NextGenTel</td>
<td>nextgentel.no</td>
<td>NORWAY</td>
<td>Major transformation of the company’s BSS and OSS, supporting all business and individual customers.</td>
</tr>
<tr>
<td>Plus Communications</td>
<td>plus.al</td>
<td>ALBANIA</td>
<td>Implementation of fully-fledged BSS system ready to serve first customers within 4.5 months.</td>
</tr>
<tr>
<td>Polkomtel</td>
<td>polkomtel.com.pl</td>
<td>POLAND</td>
<td>Support for the wholesale B2B activities with InterPartner Billing system for one of the biggest mobile telecom carriers in Poland.</td>
</tr>
<tr>
<td>PTC – Public Telecommunication Corporation</td>
<td>ptc.gov.ye</td>
<td>YEMEN</td>
<td>Mass-market business support systems (CRM, orders, billing and charging).</td>
</tr>
<tr>
<td>SIMINN</td>
<td>siminn.is</td>
<td>ICELAND</td>
<td>Enhancement of multi-service, multi-technology and multi-vendor IT environment and operations with Comarch BSS.</td>
</tr>
<tr>
<td>Telegrosik</td>
<td>telegrosik.pl</td>
<td>POLAND</td>
<td>Integrated BSS system handling subscribers of IP telephony (calling cards).</td>
</tr>
<tr>
<td>TeleYemen</td>
<td>teleyemen.com.ye/en</td>
<td>YEMEN</td>
<td>Smart BSS system supporting the development of converged telecom services.</td>
</tr>
<tr>
<td>TCI</td>
<td>tci.ir</td>
<td>IRAN</td>
<td>Support for interconnect settlements with Comarch BSS.</td>
</tr>
<tr>
<td>Mobile Vikings</td>
<td>mobilevikings.be</td>
<td>BELGIUM</td>
<td>Transformation into a full MVNO and BSS overhaul for three operator brands.</td>
</tr>
<tr>
<td>CUSTOMER</td>
<td>IMPLEMENTATION SCOPE</td>
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</tr>
<tr>
<td><strong>Cable Onda</strong>&lt;br&gt; cableonda.com&lt;br&gt;PANAMA</td>
<td>Helping a local cable operator to become customer-centric and maximize profits with a new end-to-end BSS solution.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Media Broadcast</strong>&lt;br&gt; media-broadcast.com&lt;br&gt;GERMANY</td>
<td>Support for Germany’s largest broadcast and media industry service provider in the rapid and efficient introduction of new TV services (under the brand name freenet TV), based on DVB-T2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Multimedia</strong>&lt;br&gt; multimedia.pl&lt;br&gt;POLAND</td>
<td>Deployment of a comprehensive billing system replacing the various legacy systems of Multimedia’s daughter companies.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>simpliTV ORS</strong>&lt;br&gt; simplitv.at&lt;br&gt;AUSTRIA</td>
<td>BSS system supporting the successful launch of simpliTV digital terrestrial TV services, within a very ambitious timeframe.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Grupo TVCable</strong>&lt;br&gt; grupotvcable.com&lt;br&gt;ECUADOR</td>
<td>Increasing operational efficiency via a centralized BSS system for multiple billing and customer care systems. Implementing a Field Service Management system to automate tasks in the field.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vectra</strong>&lt;br&gt; vectra.pl&lt;br&gt;POLAND</td>
<td>Comprehensive BSS system supporting the Polish multi-play operator in pursuit of a product innovation strategy, through streamlining and facilitating the creation of new offers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ViaSat</strong>&lt;br&gt; viasat.com&lt;br&gt;USA</td>
<td>Customer experience improvement in a multi-partner model of field service delivery.</td>
<td></td>
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</tr>
<tr>
<td>CUSTOMER</td>
<td>IMPLEMENTATION SCOPE</td>
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<tr>
<td>SCSK</td>
<td>Supporting the creation of an IoT ecosystem for Japanese enterprises for a software provider.</td>
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</tr>
</tbody>
</table>

scsk.jp
JAPAN
WHY COMARCH

CHAPTER III
WHY COMARCH

COMARCH IN NUMBERS

1991
Founding year

1993
Comarch onset

1999
Publicly traded on Warsaw Stock Exchange since

RECOGNIZED BY
Gartner, Forrester Research, IDC and more

THOUSANDS OF SUCCESSFULLY COMPLETED PROJECTS ON
6 Continents in about 100 Countries

OVER 6500 EMPLOYEES

THE TOTAL VALUE OF COMARCH’S SHARES ON THE STOCK EXCHANGE
USD 500 mln

SUBSIDIARIES
57

ADDED VALUE
Comarch is a software house which sells own software products to large corporations along with implementation and managed services

93% of revenues sale of own software and solutions

GLOBAL PRESENCE

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ORGANIZATIONAL STRUCTURE

prof. Janusz Filipiak
Founder and CEO of Comarch SA
Strategy, HR, Marketing

Konrad Tarański
Finance, Administration and Internal IT Systems,
CFO, Vice-President of the Management Board

DIVISIONS

Paweł Prokop
Vice-President of the Management Board,
Director of PUBLIC SECTOR DIVISION

Andrzej Przewięźlikowski
Vice-President of the Management Board,
Director of FINANCIAL SERVICES DIVISION

Zbigniew Rymarczyk
Vice-President of the Management Board,
Director of ERP DIVISION

Marcin Warwas
Vice-President of the Management Board,
Director of SERVICES DIVISION

Piotr Janas
Director of IOT DIVISION

Marcin Romanowski
Director of E-HEALTH DIVISION

Jacek Lonc
Director of TELCO SALES & BUSINESS STRATEGY DIVISION

Paweł Workiewicz
Director of TELCO OSS DIVISION

Andrzej Zasadziński
Director of TELCO BSS DIVISION
CUSTOMERS & OFFICES WORLDWIDE

57 SUBSIDIARIES
90 OFFICES
66 CITIES
34 COUNTRIES
5 CONTINENTS

EUROPE
2 AUSTRIA | Innsbruck, Wenen
3 BELGIUM | Brussels
4 FINLAND | Espoo
5 FRANCE | Montbonnot Saint Martin, Lille
6 GERMANY | Berlin, Bremen, Dresden, Düsseldorf, Hamburg, Hannover, Munich, Münster
7 ITALY | Milan, Rome
8 LUXEMBOURG | Luxembourg
9 RUSSIA | Moscow
10 SPAIN | Madrid
11 SWEDEN | Stockholm
12 SWITZERLAND | Arbon, Zug

ASIA
13 THE NETHERLANDS | Rotterdam
14 UK | London
15 UKRAINE | Kiev, Lviv

16 CHINA | Beijing, Shanghai
17 JAPAN | Tokyo
18 MALAYSIA | Kuala Lumpur
19 SINGAPORE | Singapore
20 SOUTH KOREA | Seoul
21 THAILAND | Bangkok
22 TURKEY | Istambul

MIDDLE EAST
23 SAUDI ARABIA | Riyadh
24 UNITED ARAB EMIRATES | Dubai

NORTH AMERICA
25 MEXICO | Mexico City
26 CANADA | Saint John, Montreal, Toronto
27 USA | Atlanta, New York, Rosemont, Chicago, Columbus, Tyrone

SOUTH AMERICA
28 ARGENTINA | Buenos Aires
29 BRAZIL | Sao Paulo
30 CHILE | Santiago
31 COLOMBIA | Bogota
32 PANAMA CITY | Panama City
33 PERU | Lima

AUSTRALIA
34 AUSTRALIA | Sydney, Melbourne

DATA CENTER
DATA CENTER ONLY

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CUSTOMERS IN ALL MAJOR INDUSTRIES

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<tr>
<th>TELECOMS</th>
<th>Vodafone</th>
<th>Telefonica</th>
<th>T-Mobile</th>
<th>Orange</th>
<th>LG U+</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINANCIAL SERVICES</td>
<td>ING</td>
<td>BNP PARIBAS Fortis</td>
<td>Allianz</td>
<td>Delta Lloyd</td>
<td>ERGO</td>
</tr>
<tr>
<td>FMCG</td>
<td>Heineken</td>
<td>Carlsberg</td>
<td>Danone</td>
<td>Unilever</td>
<td>Red Bull</td>
</tr>
<tr>
<td>RETAIL</td>
<td>Metro</td>
<td>TESCO</td>
<td>Carrefour</td>
<td>Auchan</td>
<td>Jeronimo Martins</td>
</tr>
<tr>
<td>TRAVEL</td>
<td>Heathrow</td>
<td>JetBlue</td>
<td>Etihad Airways</td>
<td>SAS</td>
<td>Turkish Airlines</td>
</tr>
<tr>
<td>OIL &amp; GAS</td>
<td>BP</td>
<td>ExxonMobil</td>
<td>OMV</td>
<td>Circle Q</td>
<td>Lukoil</td>
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VALUE PROPOSITION

FLEXIBLE, CONFIGURABLE SOLUTIONS

- Complete BSS/OSS portfolio with feature-rich, out-of-the-box functionalities, templates and models – manage all crucial processes in your company from network resources to the customer
- Flexible IT solutions – easily customize and configure your system according to your company’s needs

CUSTOMER-CENTRIC APPROACH

- Customer centricity – enjoy a tailored approach throughout the project and shape the solution together with our architects
- Standards-based products with common architectural constructs, easy integration with legacy systems – build future-proof IT architectures for your company

COST-EFFICIENT BSS/OSS TRANSFORMATIONS

- Managed B/OSS Service and SaaS/PaaS options (own Data Center)
- Agile organization – easily access the relevant experts from each domain and benefit from short decision-making paths
- Unified experience for managing new multi-tenant online services – benefit from the opportunities of the digital era
Since 1993, Comarch’s specialist telco solutions business unit has worked with some of the biggest telecoms companies in the world to transform their business operations. Our industry-recognized telco OSS and BSS solutions help telecoms companies streamline their business processes and simplify their systems to increase business efficiency and revenue, as well as to improve the customer experience and help telcos bring innovative services to market. Comarch’s telco solutions customers include Telefónica, Deutsche Telekom, Vodafone, KPN and Orange.

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telco-enquiries@comarch.com | telecoms.comarch.com