



MINDBill®

Billing and Customer Care Solution

End-to-End Billing and Customer Care

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Executive Overview

Today, fixed and mobile networks create new revenue opportunities for service providers by offering a convergence of voice, data, video and content services. The spotlight has moved from simply increasing the number of subscribers to maximizing profitability by introducing new business models, offering new advanced services and by gaining new markets.

Founded in 1995, MIND is a leading provider of innovative, real-time billing & customer care, mediation and provisioning solutions, dedicating its efforts to drive telecom service providers towards their realization of these goals. MIND's strength derives from its proven expertise in releasing award-winning products, a commitment to building high quality solutions for its customers, constant innovation and the ability to track the latest market trends and keep ahead of industry changes. MINDBill, MIND's convergent end-to-end billing and customer care solution, facilitates voice, data, video, and content services for both prepaid and postpaid subscribers, in mobile, broadband and wireline networks. MINDBill's flexible engine enables support for the entire spectrum of telecommunication service providers, such as Carriers, ISPs, MVNOs, MVNEs, n-Play, Cable operators and more; MIND's end-to-end solution reduces the Total Cost of Ownership (TCO) by providing a single platform for all billing needs. MIND's faster and cost-effective deployment enables immediate Return on Investment (ROI) and ongoing lower cost of operation by providing a user friendly and easy-to-use solution.

MIND offers service providers a billing and customer care solution enabling the flexibility, scalability, and reliability they need to increase customer satisfaction, reduce time to market and operational expenses, and keep up with the often-changing market conditions.

Architecture Highlights

The MINDBill Multi-layered infrastructure is supported by a modular software architecture enabling real-time distribution processing, achieving performance, scalability and high availability.

MINDBill uses an open architecture including the latest software paradigms - Service Oriented Architecture (SOA) and Document Oriented Architecture (DOA) - thus enabling fast and seamless integration with other systems and third-party applications

MINDBill is built using standardized best-of-breed object-oriented technologies such as Java and XML, and it is J2EE compatible as it is powered by a commercial Application Server.

Logical Architecture

The MINDBill logical architecture is based on four layers: the Access layer, the Business layer, the Data layer and the Management Layer.

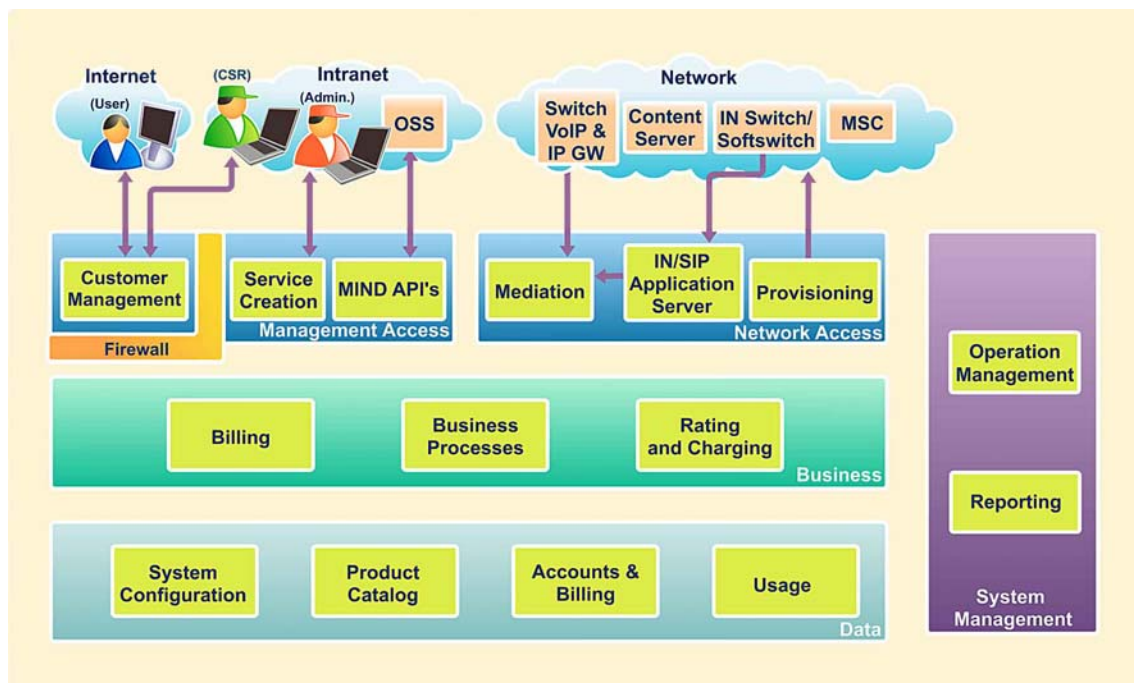


Figure 1 – MINDBill Logical Architecture

The Access Layer

All the modules that interface with external systems (i.e. Intranet, Internet, Telephony Network, etc.) are placed in the Access layer. The Access layer consists of the following sub-layers:

Management Access

MINDBill Management Access provides the operator with the following main modules:

- Service Creation and Product Catalog - allow providers to configure and launch new services and business models in fast time-to-market;
- Customer Care - Web-based Access tools for both Customer Service Representatives and for subscribers' Self-care;
- MIND APIs – Enabling open interface with external systems.

Network Access

The MINDBill Network Access enables the exchange of business and operational information between MINDBill and the various network elements. It consists of 3 main modules:

- Mediation - Provides both real-time and batch collection, analysis and processing of billing events;
- Provisioning – Updates and activates subscribers' services and features in the network elements;
- IN/SIP Application Server – Call Control for prepaid services like prepaid card dialing based on IVR services, card re-charging, etc. for both IN (SS7) and SIP-based Networks.

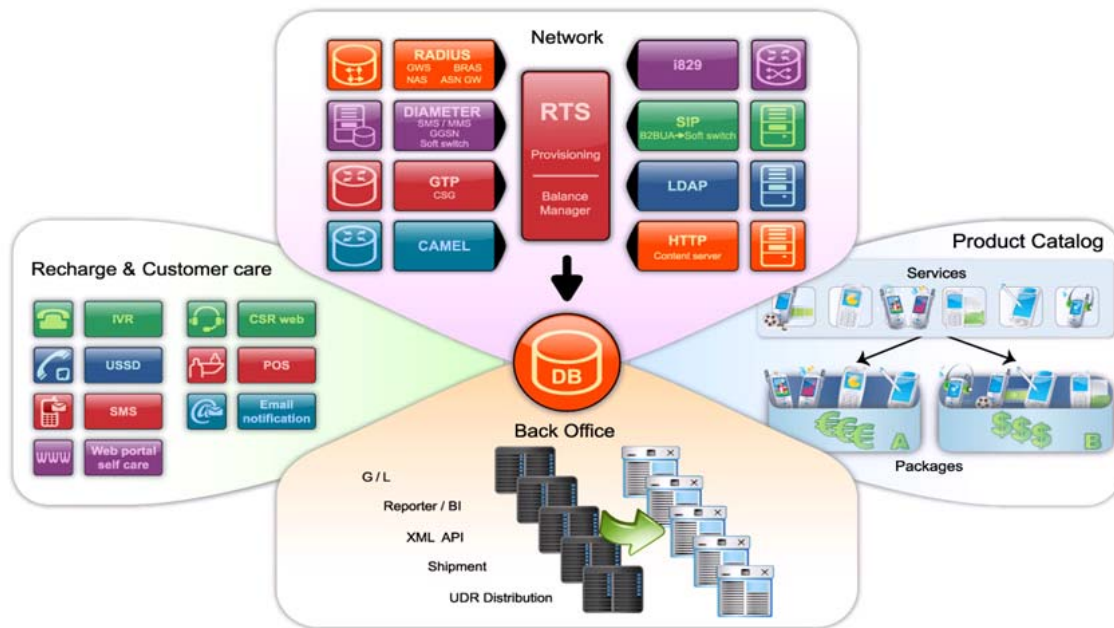


Figure 2 – Topography

The Business Layer

The Business layer consists of the modules responsible for the various business processes and business logic of the MINDBill system:

- Rating and charging
- Billing and invoice generation
- Customer creation
- Trouble ticket
- Debt collection
- Additional business processes.

The heart of the MINDBill business processes is the Workflow Engine, which provides the operator with the ability to modify and create new business processes.

The Data Layer

The Data layer holds the business persistent data. It includes the database and the common storage. It is based on the Oracle industry-proof database engine.

The Management Layer

The Management layer includes business and traffic reporting tools.

Customer Relationship Management

MINDBill CRM is a bundled solution composed of user-friendly Web-based applications that focus on customer satisfaction and retention, while enabling efficient, straightforward, and easy-to-learn GUI for Customer Service Representatives and Subscribers.

Accounts

The term 'account' is used in MINDBill to describe either a subscriber (end-user) or any other entity within a customer's hierarchy. MINDBill stores all the relevant information - such as contact and personal information, account status and statement details – for every account.

For every account, there is an assigned package that contains at least one service. In addition to the various attributes and parameters that were set at the service level, more information is added and customized at the account level of the service (such as special discounts, service status and service specific parameters), building a packet which is account specific.

Accounts belong to one of the four categories of billing options: 1) credit account (postpaid customers with unlimited credit), 2) limited-credit account (postpaid customers with a pre-determined limit); 3) debit account (prepaid customers) or 4) debit-card (prepaid disposable calling cards). In order to access the service, the customer is required to enter a user code and a password.

Unlimited Hierarchy of Accounts

The complex web of relationships between the billable entities in an organization provides a formidable challenge in allowing billing flexibility and fast processing. Not only large enterprises, but also SMEs and even families are examples of business structures that sometimes have a very complex hierarchy. MINDBill supports these complex models in order to allow the provider to offer special and flexible products and promotions to such customers and bill for these services throughout the hierarchy.

A well-structured system of accounts provides two major advantages:

- The rating and billing of services may be distributed within and between the layers of the hierarchy.
- Rules can be defined at any level of the hierarchy and applied to lower levels.

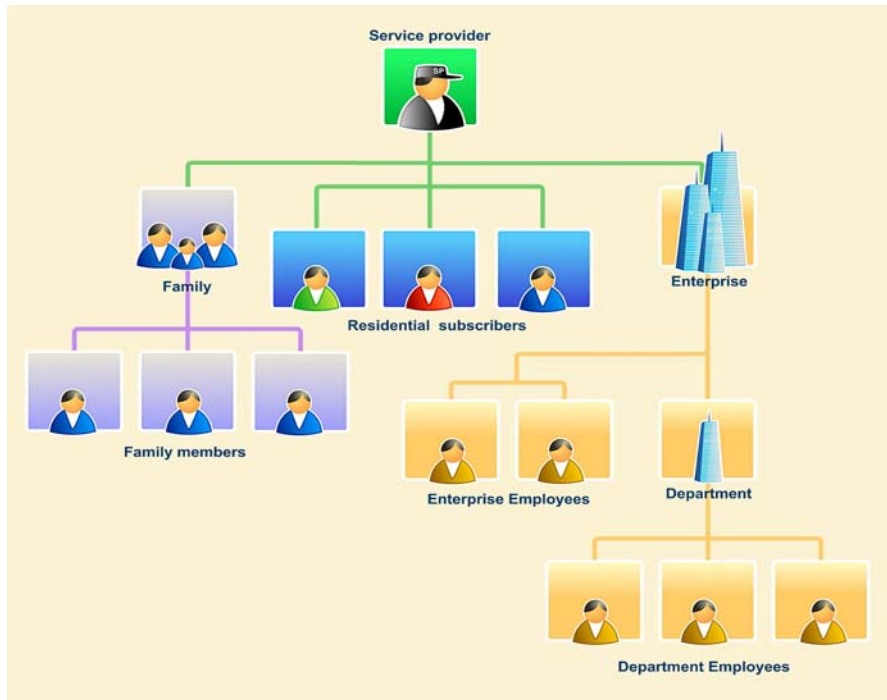


Figure 3 – Account Hierarchy model

WebClient

MINDBill WebClient is used by Customer Service Representatives to handle and manage the entire life cycle of the account, starting as a prospect, going through the account creation and order management, account maintenance, customers retention and then finalizing with ending the contract and closing the account.

This application gives the operator a complete centralized view on all the relevant aspects of the subscriber, including the services consumed, the generated invoices, finance information, customer's complaints and more. The system enables tracking and recording of all the interactions the CSR had with the subscriber.

Using MINDBill's advanced security mechanism, CSRs' operations are limited according to their access rights profile.

Account Home Page

MINDBill WebClient's Account Home page gives a single centralized and summarized view on the subscriber (or hierarchy of subscribers). It is tailored to the operator's specific needs and business model.

The Account Home page shows the subscribers' contact details, current package and services, discounts, last invoices and payments, active business processes (e.g. debt collection) and the last activities performed on the account. It also enables performing most of the common operations (e.g. adding a payment; adding a service to the subscriber; etc).

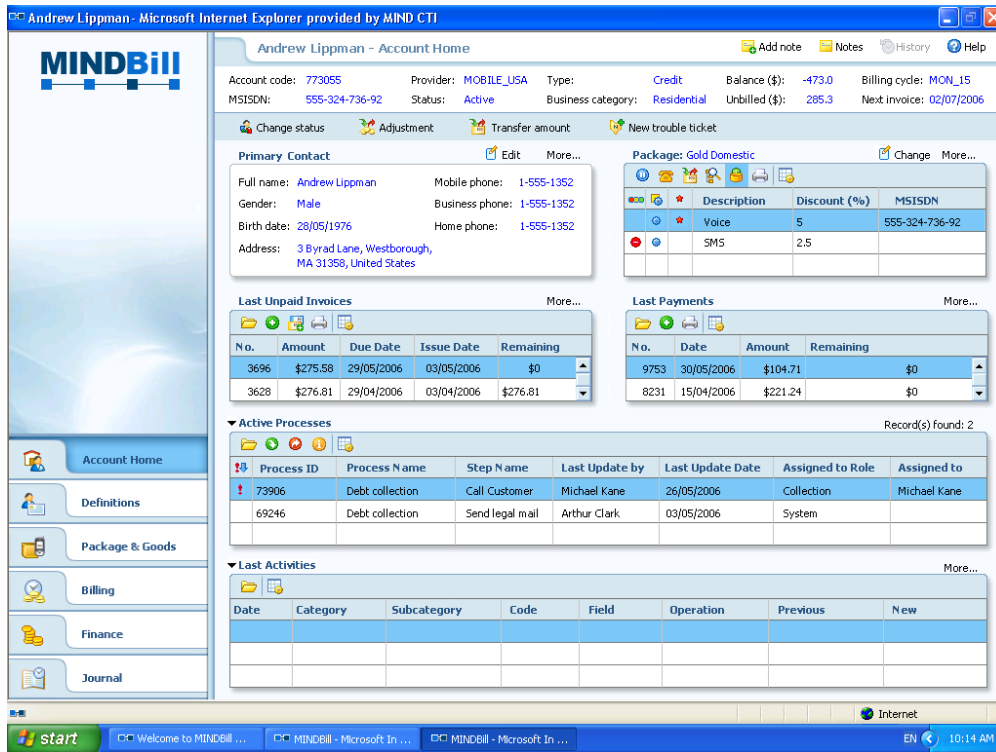


Figure 4 – WebClient home page

Order Management

MINDBill supports a flexible and robust Order Management process that handles orders from the customer's contact, through account creation, registration, package selection, provisioning and activation. The Order Management process involves different users from various departments (e.g. supervisor approval of the contract, technician test, etc.), integration with external legacy systems (e.g. inventory), interaction with 3rd party services (e.g. Address Validation) and more.

MINDBill uses its robust inherent workflow capabilities to tailor an order management process that meets the operator's business model and requirements.

The following screen is an example of contract configuration, including integration with a 3rd party inventory.

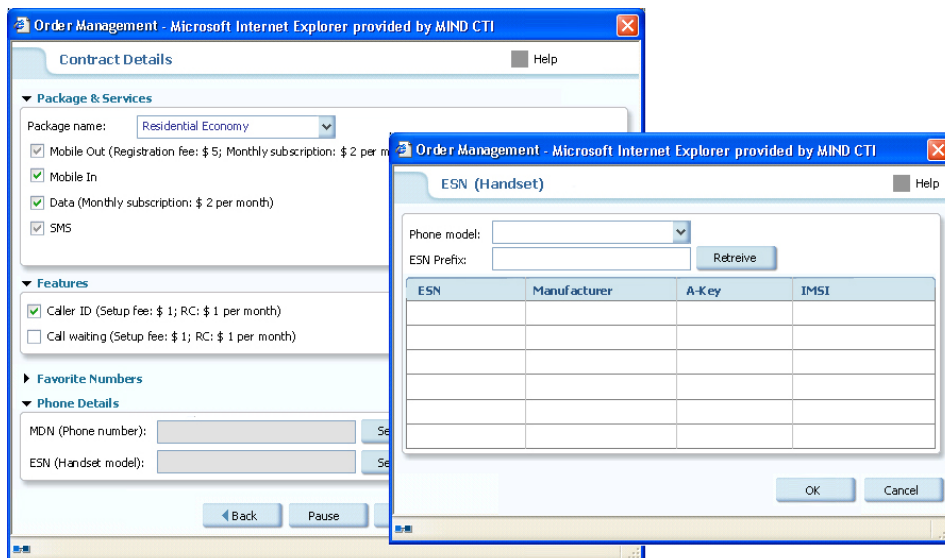


Figure 5 – Order management – contract configuration

Scheduled Package Change

The MINDBill system allows for account package change request on any day of the month, while the actual change takes place at a later time, e.g. only at the beginning of the next month.

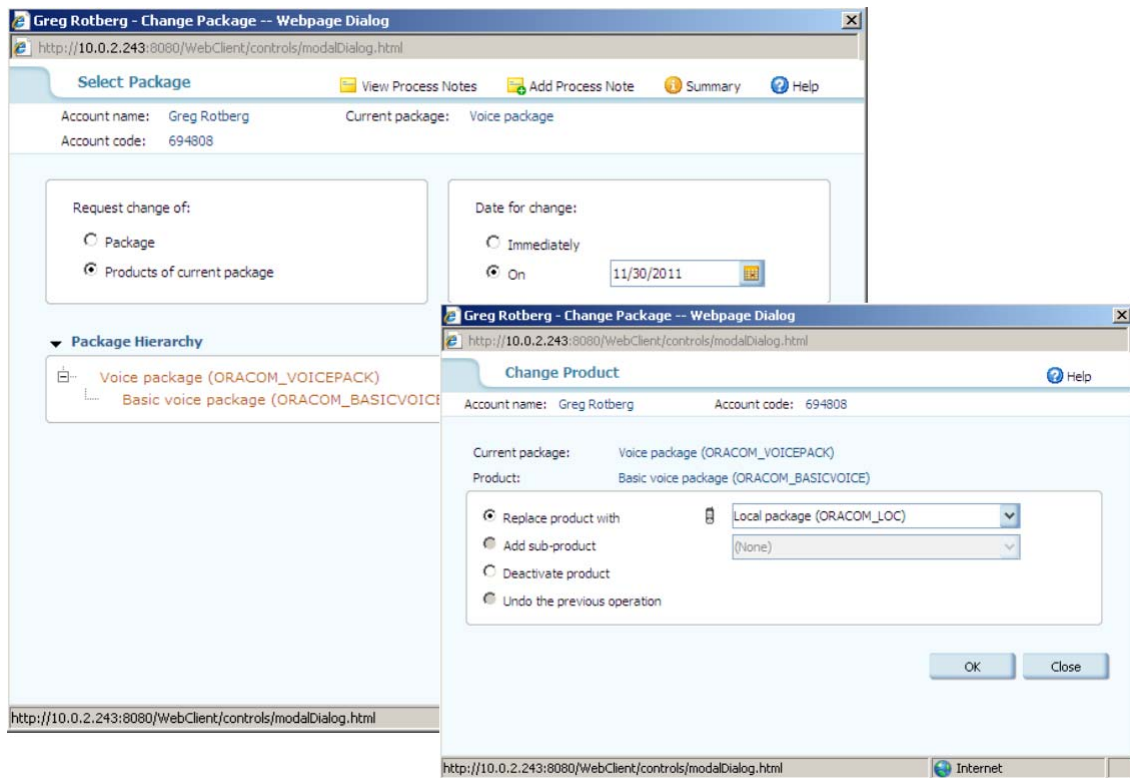


Figure 6 – Package Change

The user can switch to a new package if he finds that the current plan no longer meets his needs. He then chooses the desired services and features to be installed in the new package and the system will save the change until the predetermined date.

The flow is based on the following generic steps:

- The user chooses a new package and the desired date to implement the change. It will be either immediate (today) or a certain date in the future.
- If the desired date is immediate, then the change will be performed immediately.
- In case of a future package change request, the system will initiate a business process that opens a new future package change screen.
- On the predetermined date, the change takes place and the system clones some predefined properties of the previous package to the new package (e.g. phone numbers).
- In case of a failure, the system will retry, then attempt to perform the operation again.

Product Catalog

The MINDBill Product Catalog allows service providers to define, configure, and deploy new packages and services to suit any class of customer, and with respect to the availability and bandwidth requirements for these services, allowing them to take advantage of market developments and increase customer satisfaction. There are different classes of customers with respect to availability, bandwidth, and QoS requirements for these services. The Package & Services framework allows providers to define new packages and deploy new services instantly.

MINDBill enables the definition, rating and bundling of unlimited combinations of services into packages, as well as assigning these packages to customers. The tariffs assigned to a service can be changed to reflect cost changes and promotions. New services can be added to existing packages to be available to all the owners of these products. Services can be enabled globally or for specific customers only. Using the MINDBill Product Catalog, new packages and services can be easily created and new services can be assigned to existing packages.

Following are a few examples of services offered by service providers and that are all fully supported by MINDBill:

- Video streaming;
- Voice and Fax over IP;
- Web browsing and hosting;
- Gaming;
- IP TV;
- E-Commerce;
- Voice-mail and E-mail.

Packages

A package is the bundle in which various services are supplied to a customer. Each package must have a defined currency and only the services using that currency will be available for that package. A service has to be introduced in a package before it can be made available to the customer. Therefore:

- A package must contain at least one service;
- A service can appear in more than one package;
- Only one package can be supplied to a customer. Services within a package can be enabled or disabled. This makes it possible to provide different services even to customers having the same package. Services can be enabled globally or for specific customers only. A set of services within a package can be defined as 'mandatory', meaning that all the customers having this package must have these services enabled.

Products

Products enable providers to offer add-ons to the customers' existing packages. The product service helps and eases the administration of services. Instead of adding several services one by one to a subscriber account, the provider can add and assign products containing all the services at once (for example, a Voice and Dialup Package is built of a Voice product and a Dialup product).

A product is a group of services. Account packages are built from services and products.

An account can have a stand-alone product.

Each account can have one package assigned to it. This package can consist of services and products. The package is defined using a hierarchy of services and products. Some of the services are based on other services. These require the existence of the base service in order to be assigned to an account. These "based-on" services inherit the status (activation or deactivation) of the base service. Activating or deactivating the base service activates/deactivates all the dependent services and products. In the invoice reporting, services and products are grouped according to the service hierarchy.

Services

Services are the basic entities supplied by the provider and consumed by their customers. Each service has its own rating scheme (tariff) made up of a one-time

charge, recurring charges, usage and value-based charges. MINDBill gives providers the flexibility to define new service types, as well as customize and change existing services before assigning them to customers.

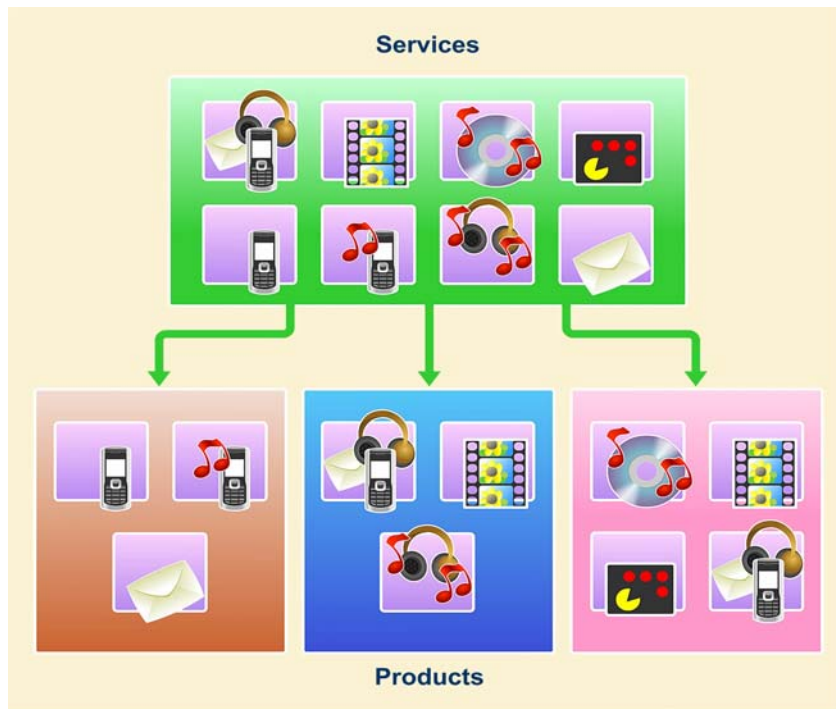


Figure 7 – Services and Products

Trouble Ticketing

A trouble ticket mechanism is essential for maintaining high-level service quality. Its aim is to coordinate the work of multiple users who may need to work on a single customer's problem and prevent problems from falling between the cracks.

The MINDBill Trouble Ticket solution is a professional problem-tracking mechanism based on the flexible workflow engine. The system is introduced with a predefined flow designed to fit a wide range of telecommunication troubles ticket handling, such as:

- Technical problems;
- Customer's invoice claims;
- Internal troubleshooting reported by the company personnel;
- Network failures;
- Software failures.

The flow is based on generic steps that can meet almost any required trouble flow, as shown in the diagram below:

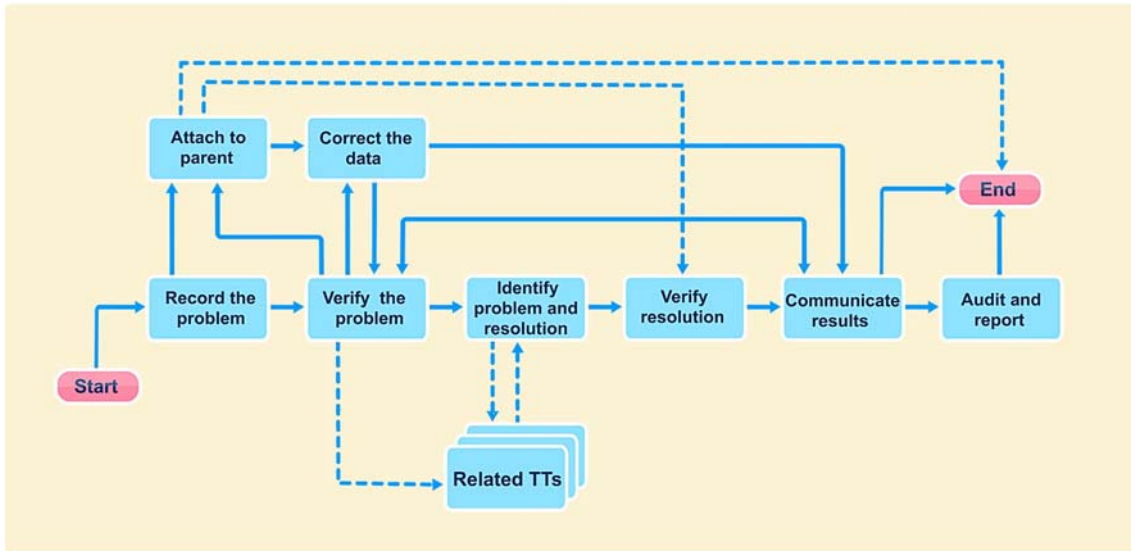


Figure 8 – Trouble Ticketing

The mechanism has the ability to maintain problem categorization, as well as specific information according to each categorization.

The ticket can be routed between different groups and users of the system according to configurable routing rules. The SLA mechanism manages the allowed period for each ticket or step on the ticket, while a notification mechanism alerts regarding any SLA violation or near violation; this mechanism can be configured according to different parameters of the ticket.

MINDBill EBPP (Electronic Bill Payment Presentation & Self Care)

The MINDBill Web applications enable convenient customer self-care through an efficient Web interface. They allow easy registration and subscriber verification of real-time balances, reduce the provider's costs, give subscribers real-time information on their account status, accessible anywhere and anytime. The MINDBill EBPP is a Web-based application that links the provider's Web site and the MINDBill system.

MINDBill EBPP enables customers to check their current account status via the Internet, and:

- View their current balance
- View the details of all calls since the last invoice
- View all the invoices generated for this account
- View all the payments registered for this account
- Add new accounts
- Add new payments.

In addition, MINDBill EBPP allows service providers to configure online customer registration and payment. MINDBill EBPP can authorize the user's credit card in real time. The ability to adapt the look and feel of the interfaces enables the provider and its sub-providers to maintain a consistent experience for the end user.

MINDBill Point of Sale Solution

The POS is aimed mostly at the wireless retail market, enabling operators to offer their products and services in retail stores and manage the process within our enhanced solutions. POS is fully integrated into the MIND Billing and Customer Care solutions, allowing operators to offer seamlessly services and accessories for new

and existing customers and even to non-subscribers. POS integrates with external systems such as the credit card clearinghouse, the external taxation engine and the address validation. POS includes three modules working together:

- The Resource Management Module
- The Sales Module
- The Cashier Management Module

Solution architecture

The MINDBill POS solution functions within the operation support system architecture, enabling an unlimited number of Point-of-Sale terminal devices to be operated simultaneously.

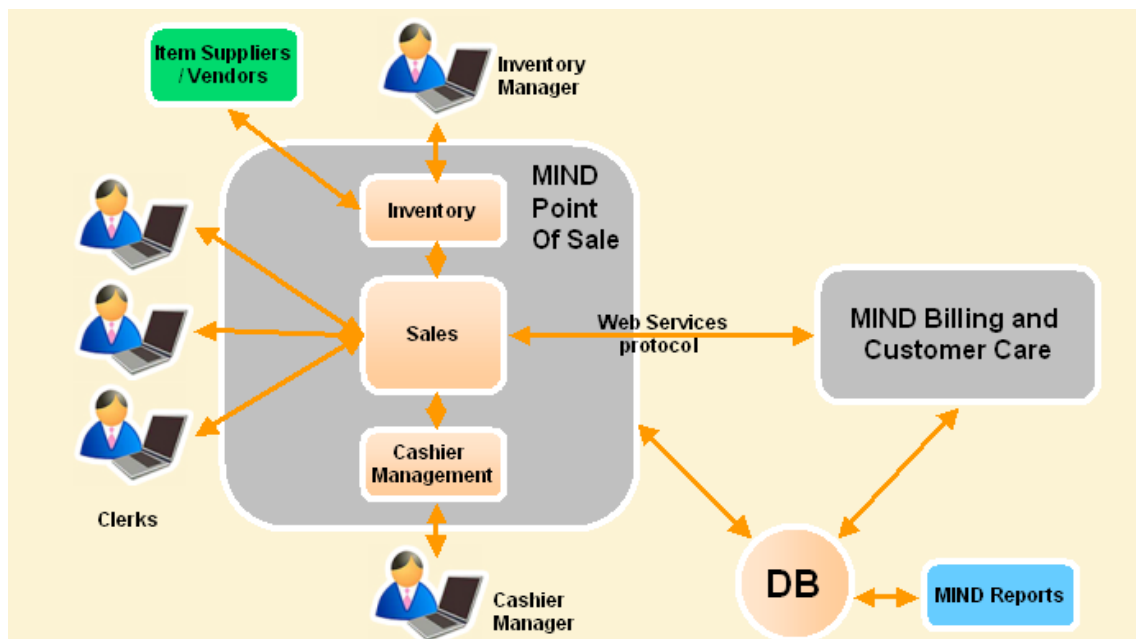


Figure 9 – MINDBill POS system architecture

MINDBill Online Store Module for Mobile Operators

As carriers add to their traditional business the e-business aspect, they require an attractive personalized online store that enables new subscribers registration as well as online shopping for goods or services in real-time over the Internet. MIND helps operators attract consumers and increase subscriber retention by supplying a sophisticated but easy to navigate e-Store module that enables subscription, selection of devices, accessories, rate plans, contract terms and payment methods.

Online stores represent the most cost effective method to get a wide reach. Attractive to carriers as they can reduce the number of physical sale locations and agents, at the same time it is an appealing alternative for consumers, as it becomes the most popular way to shop and allows them to save time.

MINDBill Online Store is based on the MINDBill POS (the Point-of-Sale application) and is rich in detailed information on the plans and equipment the carriers offer. Most important – it allows user interface adaptation and updates by the carrier's team and integrates easily with the existing carrier's website.

MIND's solution for online shopping enriches the end user shopping experience and supports the operator's complete sales flow, including real-time inventory items stock updates based on sales and order fulfillment. This new offering enhances MIND's end-to-end solution and again helps MIND customers reduce costs, as

integration between platforms is not required anymore. The benefits include the use of a single hardware platform for both retail stores and online stores, one product catalog, combined reports and a common inventory management.

The MINDBill Resource Management

The Resource Management Module is a comprehensive inventory system that supports the warehouse chain of the operator and his stores. It automates the management and tracking of the equipment sold to subscribers.

The solution keeps track and manages the equipment by serial number, status, and location, providing the flow management from the purchase order through the reception of the items shipment, distributing the items to the stores and the allocation of the items to the customers.

The MINDBill Resource Management features:

- Handling of item reception including a full management of P.O. Agreements with the suppliers;
- Item catalog and pricing management;
- Item status flow management and control including on-hand count procedures;
- Items locations management;
- Report generation on the inventory items;
- Integrated solution with MINDBill Billing and Customer Care platform;
- Integrated solution with MIND POS;
- Integration with POS hardware devices such as the bar code reader for easily locating an item by scanning.

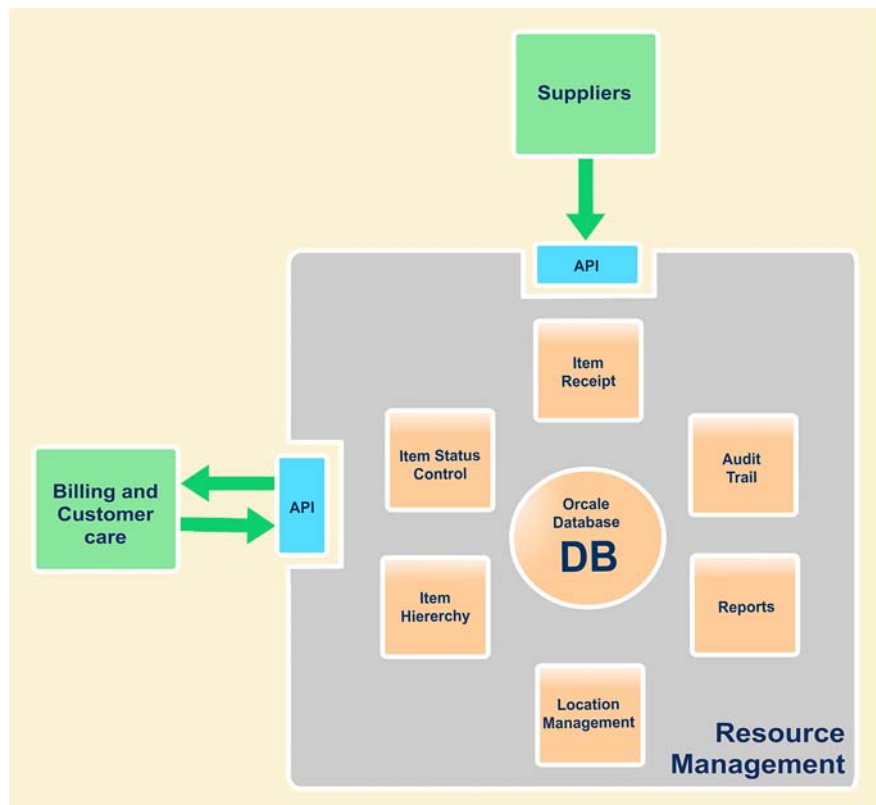


Figure 10 – MINDBill Resource Management Architecture

The Sales Module

The sale module is an easy to use cashier station that supports all service activations, phones and accessories sales through one interface on a single receipt. The Sales module enables all payment methods such as Cash, Check, Credit Card, etc. It provides full control of the cashier devices such as Cash Drawer, Credit Card swipe, Bar Code reader and Ribbon printer.

The Sales module interacts with the Resource Management module to show the sales clerk the available items for sale in the store warehouse, to assign sold items to customer accounts, and to enable flows such as returns and repairs.

The Cashier Management Module

The cashier module is a comprehensive store management environment that implements, in coordination with the Sales module, drawer and workstation assignments to clerks, Open day and Close day procedures, Cash transfers between drawer and safe, and a rich set of reports.

Goods

Goods are equipment items (e.g. GSM Phones) supplied by the provider and related to specific services, packages, or directly to accounts. They are billed and handled by MINDBill. Goods types and models can be defined and assigned to services using the MINDBill Product Catalog. The customer can receive an equipment item separately or bundled in the package.

Account Journal

Customer care is based on having an up-to-date, comprehensive, and consolidated customer profile. MINDBill has a **Customer Relationship Management (CRM) Journal**, which keeps track of all customer-related events and information, creating a complete customer profile. CSRs can manage their customer relationships in an organized way; by accessing information, they can match customer needs with product plans and offers, remind customers of payments or service requirements, or find out what other products or services a customer has purchased.

Partner Management

Today's network operators must conduct business with an increasing number of partners to successfully meet the business and technological challenges of the communications market.

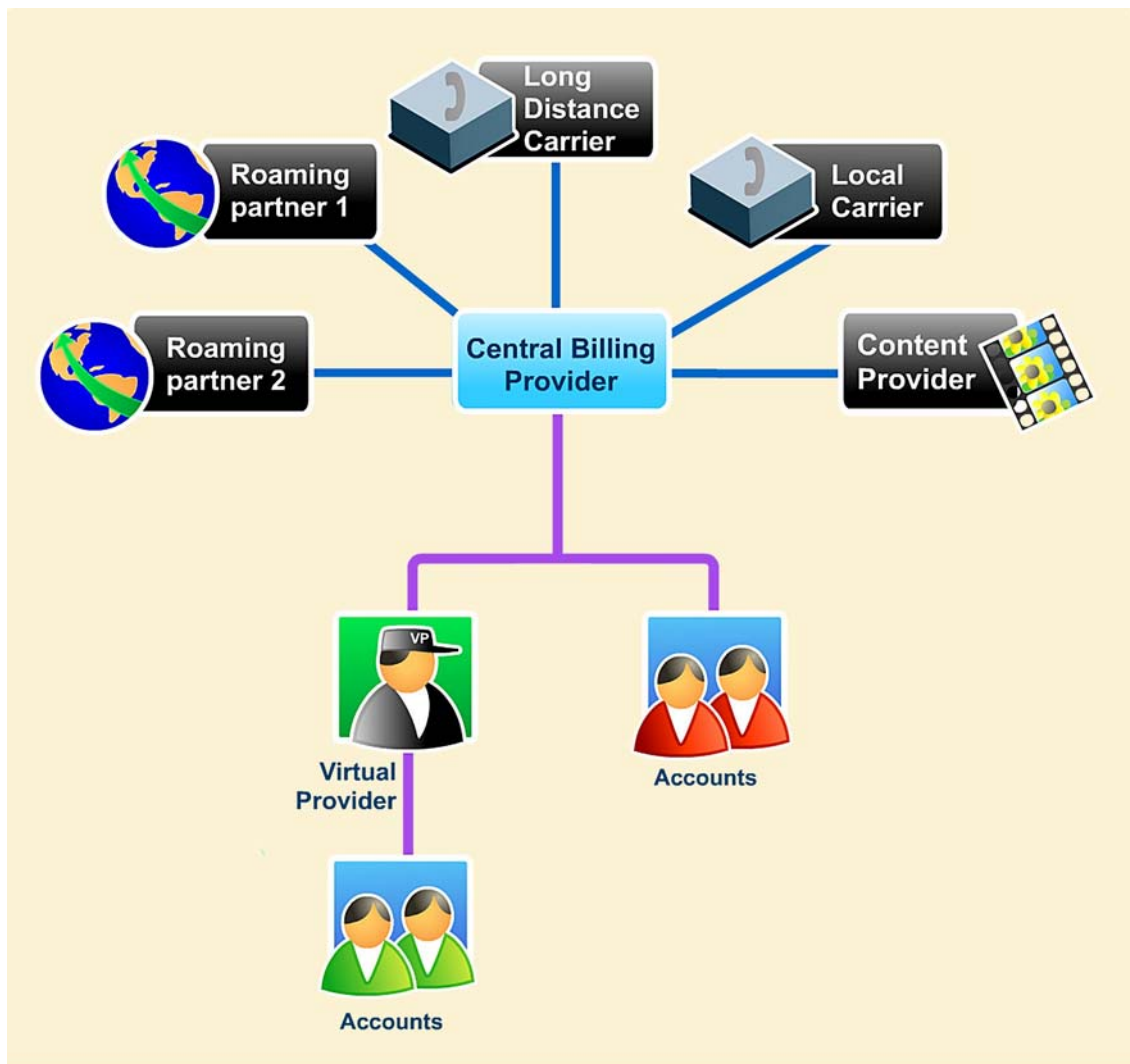


Figure 11 – Partnerships Model

To increase profit margins, service providers need to intensify subscribers' usage by offering a variety of services and applications. The ability to market different, multi-origin services under a unified service brand, as well as deliver a single service under multiple service brands is vital. MINDBill gives service providers a powerful tool to define, track and manage partnership agreements through a blend of revenue-sharing schemes based on a variety of rating metrics.

- Fixed or percentage-based commission;
- Usage-based rating by volume, item, or value;
- Hierarchical and multi-party rating for varying rates throughout the value chain;
- E-commerce transaction rating provided by third parties;
- In the case of transactions that involve multiple partners, MINDBill allows the definition of different rates between any two parties along the value chain.

Business entities and relationships

MINDBill's robust partner management solution covers all types of partnership agreements, ranging from: interconnect agreements and supporting roaming partners; commission-based agreements applicable to distribution and channel partnerships, to usage and content-based agreements applicable to content providers. MINDBill makes it simple to define, manage, rate, and bill a wide range of settlement models including a chain of wholesale-retail markup tariffs.

The features included in MINDBILL cover:

- Issuing statements, invoices, reconciliation and credit notes
- Issuing comprehensive settlement reports
- Dispute handling mechanisms
- Implementation of complex revenue-sharing schemes.

Interconnect

Service providers typically have their own network and central billing system. Services outside the provider's network are provided according to agreements with other providers.

The Interconnect reporting module of the billing system is responsible for rating calls according to the agreements with other providers. Interconnect calls are calls handled by more than one operator. An interconnect charge is the charge for carrying a call that originated or terminated on another network. With the Interconnect reporting module, the Service Provider can claim payments and validate claims for payment of the interconnect charges.

Roaming

Roaming, the ability to provide services to visiting subscribers, on the one hand, and on the other hand, to roam subscribers in other networks, has become an integral part of the mobile service. The MINDBill system provides the ability to generate roaming usage files, TAP files for GSM Partners and CIBER files for CDMA Partners, for inbound traffic of visiting roamers, and to process incoming TAP/CIBER files of outbound roaming usage traffic. Using its partner management capabilities, the MINDBill system provides the ability to define and manage the required roaming contracts terms (IMSI/MIN range, MNC, MCC, cut-off time, etc.) and the applicable tariff plan (IOT) for each roaming partner. Therefore, it enables to apply a markup-based, flat rate based, IOT-based, or any other required rating model for the incoming roaming traffic. As for the outgoing roaming traffic, the MINDBill Roaming Files generator enables to create TAP3/CIBER files for all of the applicable roaming partners using either a single IOT plan for all the partners, or multiple IOT plans. Furthermore, it supports processing and generating RAP files and CIBER rejects files.

Virtual Providers

MIND offers a Virtual Provider (VP) Architecture, where the main operator can have its **branded offerings** managed from the billing perspective as separated accounts from its own. The VP module allows the network provider to lease its network equipment and its billing system to other providers.

These VPs are able to create subscribers (accounts), assign them and have complete control over the customization of invoice layouts and content through branded invoices and reports.

The VP bills its subscribers according to its business models. Additionally, the parent provider bills its VPs based on diverse business models:

- Usage based (usage of the VPs' subscribers is billed by the parent provider).
- Flat fee – the parent provider bills the VPs a recurring charge, which is not usage dependant.

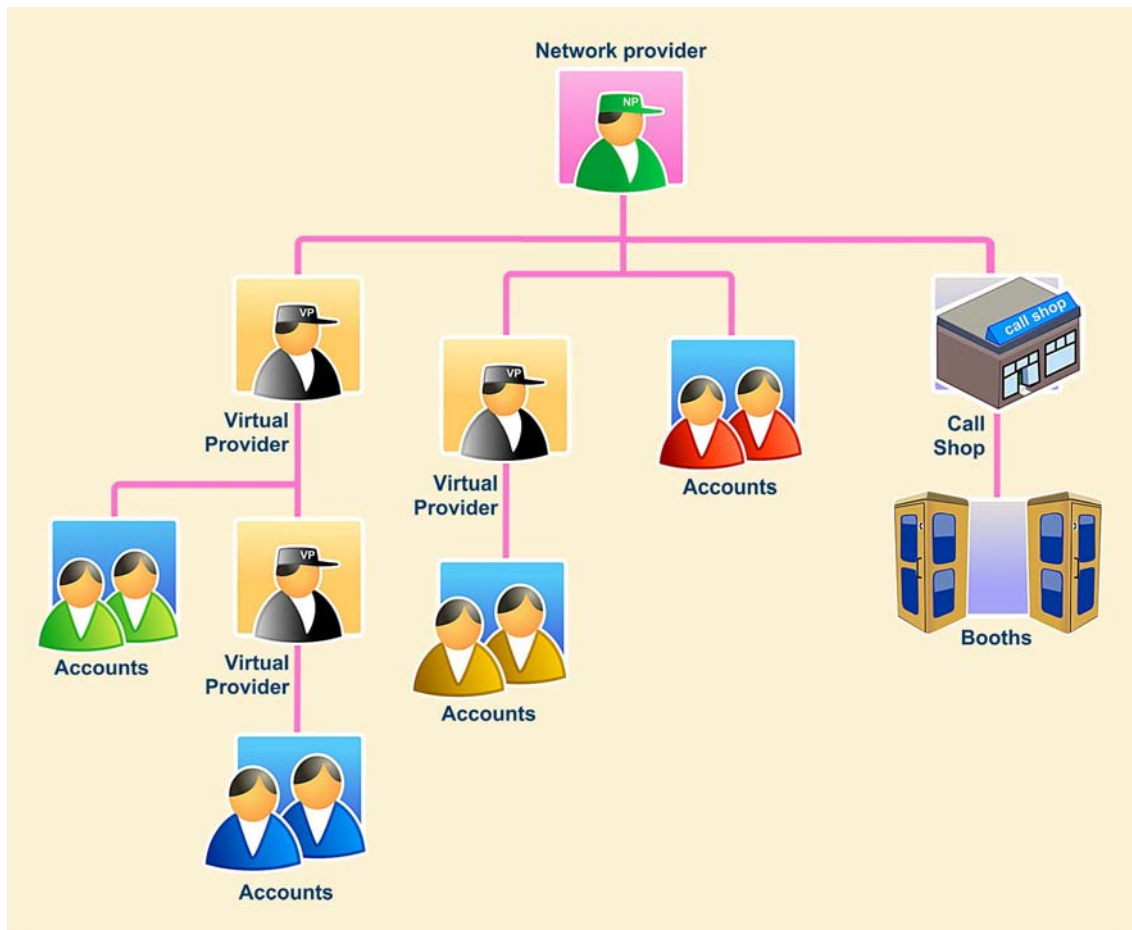


Figure 12 – Business model diagram

Key features

- Multi-level hierarchy of providers and virtual providers, accessible according to security permissions.
- Each level can create and manage its own accounts, call shops, and VP descendants.
- the hierarchy is visualized.
- Each level can be billed by its parent provider according to the various rating schemes that exist in the system (e.g. usage-based, fixed rate, a combination of the two, etc.).
- Independency to the VPs to manage their business:
- Complete business segregation (product catalog per each provider).
- Enhanced security enabling the network provider to define the level of VPs' independency.
- Web access to the VP functionalities.
- Ability to pass on parent characteristics to the descendants
- Revenue leakage prevention
- Restricting VP to offer only certain services and features.

- Blocking the VP's subscribers according to VP's balance versus its parent provider; call shops web-based management application.
- Flexible mediation, enabling mapping a business event of a subscriber (e.g. a phone call) to a specific service of the VP (in front of its parent), according to customizable business rules.

Agents

Agents are 3rd party independent representatives that receive a commission based on the revenue generated by the subscribers/customers that they acquire for the provider. The system enables assigning more than one agent per account, reflecting a more sophisticated partner scheme.

Commissions

The commission received by the agent can be calculated either according to one of the rating types, or according to any defined combination. The agent's commission can be a combination of fixed amount per invoice, fixed amount per call, fixed amount per minute, or percentage.

Call Shops

In order to place a long-distance/international call, a person may come to a special calling center, also known as a call shop. The customers will be assigned to a booth, and at the end of their calls they will receive an invoice that includes the call details information. The call shop policy may require that the person make a deposit before calling, the remaining amount being returned after the invoice is generated.

MINDBill supports the special business model for call shops, including fast and reliable WEB access to booth details and customized reports for profit and loss.

The operations that can be performed by the **Call Shop** user are:

- Web-based booth management
- Viewing/editing booth details
- Updating the credit limit
- Viewing new usage
- Adding adjustments
- Generating and printing booth invoices
- Updating booth tariffs (without intervals and profiles)
- Generating invoice reports
- Generating call details reports
- Generating adjustment reports
- Viewing/editing **Call Shop** details.

Billing and Finance

MINDBill gives service providers the ability to manage various aspects that concern financial and revenue management, allowing them to know the financial situation of the business in real time.

Rating

MINDBill provides the flexibility needed to define new service types, their attributes and rating schemes, and make them instantly available to the customer. The real-time rating engine allows service providers to offer an unlimited number of rating schemes and billing plans, easily implementing new technologies and service pricing requirements. Providers can set different tariffs for individual customers and customer groups, and offer a variety of service bundles.

Using MINDBill, providers can introduce promotion packages, discounts, and special rates to specific market segments. International providers can define rates in different currencies using the multi-currency and multi-time zone functionality, facilitating the assignment of special rates for certain days or time-of-day.

The Rating Engine

The Rating Engine provided by MINDBill is a powerful and flexible tool that operates in real time and allows providers to offer different rate and discount plans for different services and products. The MINDBill rating engine is designed to help providers increase the customer satisfaction level by differentiating the product offerings in order to meet client requests. Service providers are able to plan new products, services and promotional packages, and also to rate usage accurately and conveying billing flexibility.

The MINDBill rating engine allows:

- Real-time functionality
- Different tariffs for individual and group customers
- Pricing based on multiple metrics – data amount transferred, number of services accessed, specific content or application, quality of service
- Special discounts based on user-defined criteria
- Rating differentiation based on time of day, access device, bandwidth or location for the same service.

The Rating Rule Editor

MINDBill comes packed with a powerful and accurate rating rule editor which enables providers to create rules for assigning discounts based on various parameters, such as age, dates, traffic, and many others.

Invoicing

Invoice and shipment processes are crucial for the service provider to generate revenue. MIND provides invoice and shipment servers based on the J2EE technology, which ensure performance, scalability, and stability of the invoice generation, layout & shipment processes.

The main features supported by the MINDBill invoice server are the following:

- A single bill for all services;
- Two methods of invoicing:
- Open invoice – Separate balance per invoice;

- Closed invoice – One invoice open at all times with balance forwarded from previous invoices;
- Each account can be assigned a separate billing cycle (weekly, monthly, quarterly, etc.);
- Post calculations (volume discounts, fixed charges, adjustments);
- Each step is monitored and revenue assurance reports can be generated;
- Invoices can be shipped by means of one or more of the following ways:
 - Regular mail (hard copy);
 - E-mail (HTML or PDF);
 - Exported file (CVS, EDI);
 - XML format for 3rd party printing house integration;
 - Split billing is possible between billable accounts and services;
- A minimum amount required to issue and/or ship an invoice can be set;
- The option to include/exclude usage (call) details;
- Special charges for call details can be set
- Special charges for hard copy can be set per invoice and/or per page;
- Multilanguage invoice;
- The grand total can be displayed both in the main currency and the local currency of the customer;
- The billing process, which includes invoice generation, can be performed in multiple billing cycles, in order to spread the billing operation throughout the month. Service providers can preset multiple billing cycles and then assign an appropriate billing cycle to a customer according to each provider's policy;
- Payment and dunning - MINDBill calculates the due date for invoice payment during invoice generation. This due date is calculated based on the invoice generation date + x days, according to the customer's payment terms. The systems' default payment terms (days) may be overridden at the provider level and the CSR can further modify them per account;
- The invoice can be generated in various methods:
 - Manually by CSR e.g. initiating account closing;
 - Batch invoice generation - The batch method is used when immediate billing is required for particular providers/group of customers. Such actions are usually required to make billing corrections or when there is a need to settle all the accounts and begin a new billing procedure;
 - Automatically, by the billing cycle task;
 - Enhanced monitoring tool for administrators;
- User exit – the invoice process supports users and exits in order for MIND to be able to tailor customer-specific and individual requests into the invoice process. Such requests can add specific messaging into the invoice.
- In addition, it is possible to customize an Invoice per the customer's request.

General Ledger (G/L)

MINDBill has full flexibility in configuring the mapping between financial transactions and the G/L account codes, irrespective of the service providers' business model. The financial information is periodically summarized and reports are generated. Furthermore, the information is exported to the providers' financial system.

Payments & AR Account Receivables (A/R)

MINDBill manages all A/R activities, monitors the A/R status online and ensures a continuous cash flow. Multiple payment methods are supported by the system, with interfaces pre-integrated with major financial institutions, banks, clearinghouses

and credit bureaus. Management of deposits life cycle, including payments and refunds, is easily done. Disputes can be managed and solved, resulting in the appropriate adjustments.

Collection Procedures

The MINDBill Collection facility provides flexibility in defining the collection policy using different collection paths. The solution provides full monitoring and control of the collection treatment (dunning process). It identifies customers with past due debts and ensures that they are handled in accordance with the company policy. This increases efficiency through the automation of the majority of the collection functions, and helps maximizing the success ratio.

Debt Collection (DC)

Debt collection is an automated business process that manages on a predefined time scale the collection of overdue debts by initiating collection actions. The Debt Collection is configured to automatically initiate a set of actions when an invoice is considered as overdue and any additional grace period has passed. The basic structure of a DC process is a cyclic set of actions followed by pending delays.

The set of actions included within the DC process are divided into the following categories:

- User-based actions – The user needs to perform a certain activity or to be notified of certain information. It is possible to customize the GUI for any of these actions according to the operator's business rules and needs.
- Reports and letters generating actions – The DC process can be configured to generate and ship reports, letters and SMSs to the relevant recipient.
- Services suspension actions – The DC process can be configured to suspend a certain service portfolio pending any given business conditions and time frame. This can be done automatically or pending a system user approval.
- Perform account closure – The DC process can be set to initiate an account closure process, where, among others, it can initiate a final invoice and perform write-off activities.

The module supports the simulation and establishment of payment agreements with customers and controls them from the moment of the request to the conclusion or breach of the agreement. Payment agreements can be a Promise (term for a payment postponed for a predetermined date) or a Payment Arrangement (several installments / amounts payable on predetermined dates). These are defined considering flexible parameters (e.g.: number of installments, period, calculus method, commission fees, interest rate).

The DC module also includes a subscriber web interface that allows subscribers to resolve billing inquiries themselves and a user-friendly customer support representative web interface that allows operators of the system to perform customer care from any location.

With the MINDBill Debt Collection module any enterprise is now able to treat its collection process in a fully integrated way, with a tool that will enable a better integration between departments, a higher level of process efficiency and the complete centralization of collection actions.

Pre-paid

Prepaid services are a force driving the service providers' growth worldwide. Prepaid subscribers can be turned into postpaid ones, making it important to ensure a high level of customer satisfaction. The prepaid subscriber needs to have control of his prepaid account and requires the same level of service and customer care as a postpaid subscriber.

The Prepaid Management module features an intuitive and user-friendly web-based interface that allows you to manage prepaid calling card lots and vouchers. The application has two main modules: Lots Management and Cards Management.

Lots Management

The Lots Management module is used to perform various functions on prepaid calling card lots or cards groups. The Lots Management tool enables the provider to manage the lots activation and promotions, to edit the lot and even to keep track of the lot history. Lots usually contain a very large number of cards, which puts constraints on the operators who need to operate with only part of the cards in a lot (e.g. assign it to an agent). In order to simplify such tasks, MINDBill Prepaid Management introduces the concept of Card Groups. Card groups are portions of the same lot (i.e. they have the same S/N prefix) and represent ranges of cards with consecutive S/Ns. There is no hierarchy between cards groups. Each such portion can be assigned, as mentioned above, to agents. The agent can perform several actions on its assigned cards group, such as activate or suspend them. The agent also obtains a commission on the usage of the cards in its groups.

Cards Management

The Cards Management module enables the user (for example an agent) to view information on the prepaid calling cards and vouchers. The agent can view only the cards that he has rights on. This application is a very useful tool for agents, who can edit calling cards and keep track of them and their usage.

Voucher management

The MINDBill Voucher Management functionality facilitates the automatic creation of voucher lots, each enabling different charging models, access restrictions and services associated. The vouchers can be used as rechargeable cards, one-time prepaid disposable cards, and for refilling existing accounts. Vouchers can be activated and used by accessing the operator's Web portal and typing in the vouchers details, PIN code, and password. Vouchers may have an expiration date and usage limitations measured by time, volume, and location.

Balance management

The MINDBill Balance Manager enables service providers to manage simultaneously multiple prepaid services for a single subscriber. The services can be traditional voice, simple data transmission (basic Internet access), rich content, video streaming, MMS, gaming, and others. For example, in 2.5G and 3G mobile networks, the subscriber may download a video clip, read an e-mail message and have a phone call, all at the same time, using a single prepaid balance.

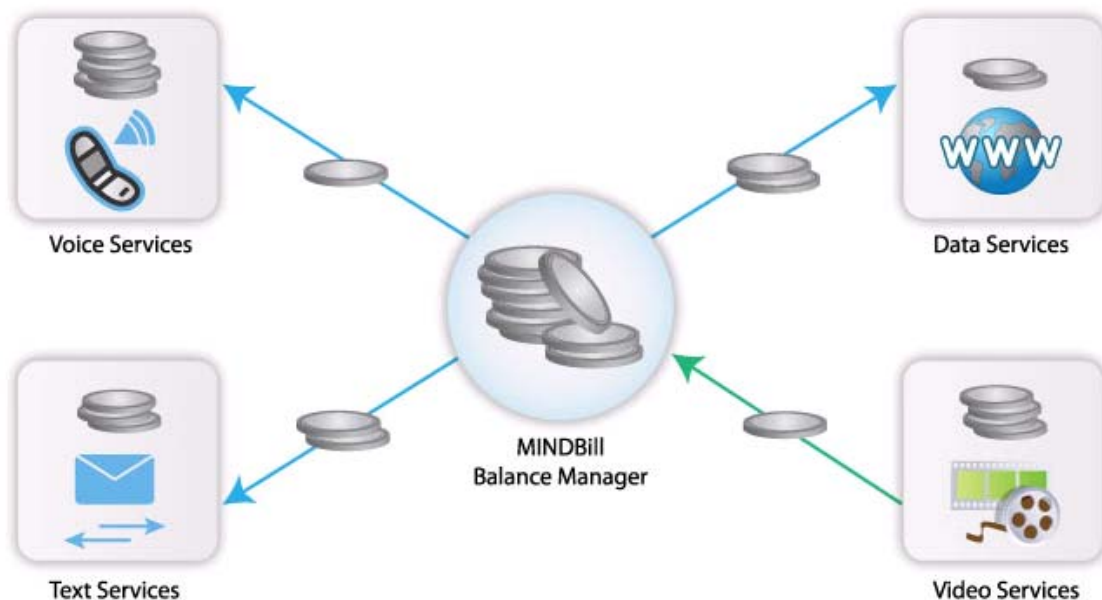


Figure 13 – Balance management

Service enabling

The MINDBill solution is flexible, proactive, and capable of controlling each session and content item. Different rules can be set per service or per specific content category to determine how and when the related sessions would be authorized and controlled. Access to services may be denied in advance or cut off immediately, based on the subscriber's profile and current balance.

Service Intelligence

Offline Mediation

MINDBill provides a reliable, flexible and scalable mediation solution, allowing the service providers to offer high quality services and support their required business and revenue model.

The MINDBill mediation solution is built upon several components:

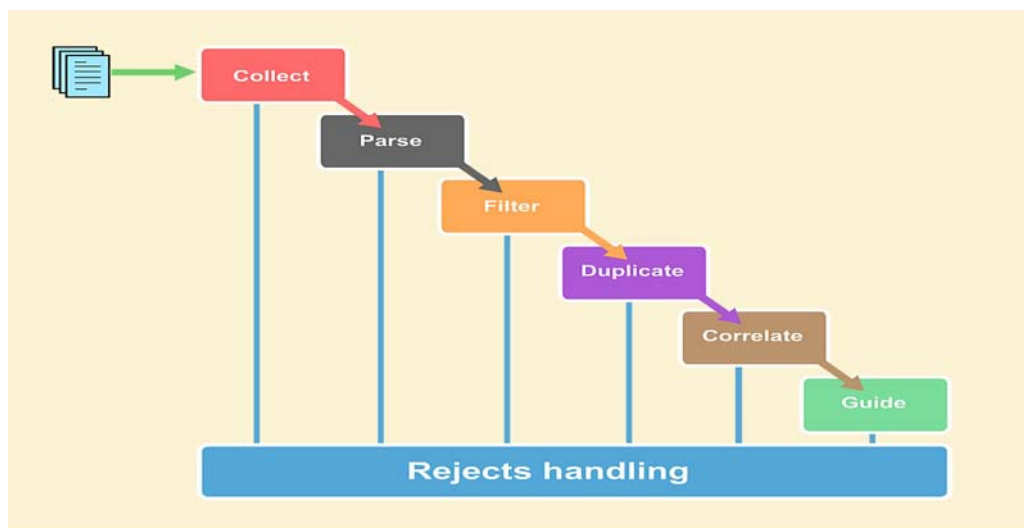


Figure 14 – MINDBill Batch Mediation flow

Using an ordered process through which the CDRs are collected in an offline mode, this solution ensures that all CDRs are met to their correct specifications and appropriate tariffs as well as enabling vital information on rejected CDRs.

Real Time Mediation

Authentication, Authorization and Accounting (AAA)

The MINDBill Real-Time Server provides a full set of real-time AAA functions, including subscriber authentication (by CLI or calling card PIN and password), call authorization based on subscriber balance and dialed number, reverse rating according to flexible multi-dimensional rating schemes and subscriber balance management. Advanced rating features such as rounding of call duration, call setup charge, minimal/maximal charge, minimal/maximal duration, stepped and tiered rates, special discounts and many more are fully supported. The MINDBill Real-Time Server blocks the subscriber accounts during calls in progress, which prevents the usage of the same account simultaneously. It is also possible to completely block an account after a certain (configurable) number of authentication attempts failure. The MINDBill Real-Time Server also supports additional advanced features such as changing of calling card passwords and re-charging of prepaid accounts from vouchers and credit cards.

Using an N+1 configuration, the MINDBill Real-Time Server can be deployed for a full load sharing and automatic failover support. The MINDBill solution provides an inherited load-balancing mechanism between the servers. Therefore, if one of the servers fails, no data will be lost, since all subscriber-related data is stored in the central MINDBill Oracle Database.

The AAA procedure is mostly used within systems that require an online interface with BSS or OSS systems, for authentication and credit control. The RTS supports RADIUS, DIAMETER, or DCCA protocols and provides the following functionalities:

- A variety of transport protocols – The RTS supports both TCP and UDP transport protocols for the AAA traffic.
- Authentication and Authorization requests - The end user can be identified by various methods, such as user code and password, IMSI/MIN or calling number ID (ANI, MSISDN). Then, based on the customer's service profile and the requested service, the session is either authorized or rejected. Authorization can be done using an external charging server.
- Accounting messages – Periodically or once a session is ended, the RTS can aggregate all of the relevant session parameters, such as duration, volume, QoS measures, subscriber information and others, and use them all to construct a Call Detailed Record (CDR). As an option, MINDBill can apply rating and then the CDR is stored in the database and the customer's balance is updated.

Provisioning and Service Fulfillment

The MINDBill customer database includes valuable information regarding the customers' personal data, identification parameters, and the services provided. The information is crucial for all the other systems integrated with MINDBill to work properly. The MINDBill Provisioning server can provide this information in real time, on demand, and can utilize a workflow mechanism to provide any required business logic to ensure infrastructure efficiency and prevent revenue leakage. Usually, the MINDBill Provisioning server is also triggered by data updates and it exports it to any external system, such as network elements or ERP systems, usually in an XML or text structure. The provisioning interface to these systems or elements can be done using a variety of different methods: LDAP, CORBA, HTTP, SOAP, or GCI, and it usually requires a customization to each vendor's specific APIs and protocols.

SIP / IN Prepaid Application Servers

Staying ahead of the competition represents an ever more difficult challenge in today's prepaid communications market. In addition to lowering their prices, providers have to offer more complex and attractive services to the increasingly knowledgeable and demanding customers.

SIP Solution Architecture

The MINDBill solution for prepaid services in SIP VoIP networks is based on the industry-proven MINDBill Billing & Customer Care system with the addition of the MINDBill SIP Application Server. The solution can be easily scaled up as your business and network grow, and guarantees high availability based on automatic failover mechanisms implemented in all of its critical components.

The various components of the solution include a full SIP B2BUA interoperable with VoIP equipment from the leading vendors, an internal IVR function extensible by connecting to an external Media Server, an AAA server with an enhanced rating engine, and Web-based tools for configuring and monitoring the network, services and rates, and managing subscribers and calling cards.

The MINDBill solution for prepaid services in SIP VoIP networks is built upon several components. These industry-proven components are responsible for call control, IVR, AAA, rating, CSR and management functions, and span across the core network, mediation/OSS and BSS domains. The SIP Application Server connects directly to a Softswitch or any other call routing network element.

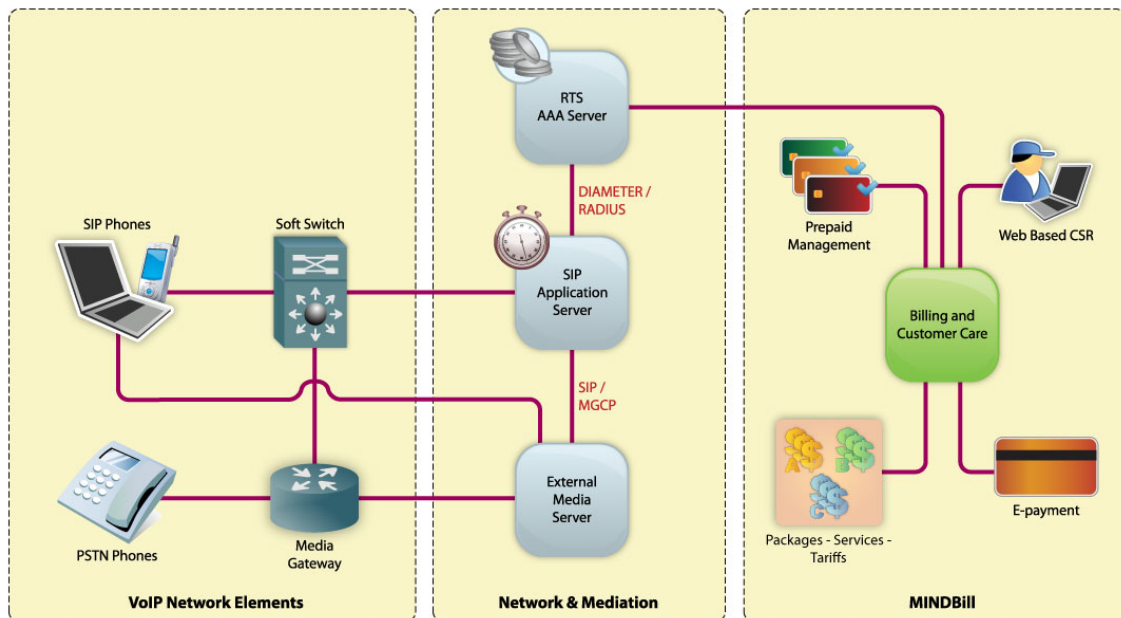


Figure 15 – The MINDBill SIP Prepaid Services Solution Architecture

The IN Prepaid Solution

The MINDBill IN Application server provides the ability to deploy prepaid services in traditional SS7 networks. The IN Application server solution is based upon an IN SCP and IVR that are linked together with the MINDBill RTS and Balance Management systems for AAA and quota allocation. The IN Application server SCP is usually addressed by the network switches, and based upon the AAA information it reverts to them the given quota. The IN Application server IVR is used for displaying the required application prompts and collecting DTMF tones.

Being a SS7 signaling node, the IN Application server maintains its own point codes in the SS7 network and it can connect to either ANSI or ITU SS7 signaling networks via E1/T1 connections. This sophisticated IN Application server uses a full redundant solution with load-balancing capability. Furthermore, it manages its own TCAP transactions and at the application level it supports both INAP/CS1 and CAMEL/CAP protocols for the IN part.

Infrastructure and Operation Management System

Business Processes Environment

Introduction

Customer Care & Billing processes are one of the most significant practices to drive business performance. These processes are fundamental for bringing innovative and competitive ways of delivering products and services to market. Operator processes are becoming increasingly explicit and business process management (BPM) is evolving from a paper-based diagramming tool to a comprehensive solution that models, monitors, simulates, and redesigns processes for competitive improvement.

MIND's automated Business Processes engine allows operators to excel with today's top challenges. The business processes workflow implemented by the engine provides business intelligence behind day-to-day operations (adding customers, upgrading packages, etc.). The engine also automates the interaction with network elements (HLR, MSC, SMSC, Voicemail) and 3rd party software (credit scoring, address validation, site mapping). All are done following a uniquely defined set of business rules set by the provider.

MIND is offering in its deployments tailored, fully automated, order management process, service fulfillment processes, trouble tickets, and debt collection processes, all unique to its market segment.

MINDBill Business Processes engine provides the scalability and reliability needed for millions of active processes. MINDBill Business Processes Studio enables the flexibility to adapt to any process required by the operator, modify it to maintain the operator's innovation and become a dynamic convergent communications provider.

Business Process Development Life Cycle

The life cycle of a new business process is short and intuitive. Once the **idea** is raised, the concept is translated into graphical representation (**design**), and **deployed** for **testing** and simulations. Once approved, the **production** environment is updated with the revised flow, allowing **monitoring** on the various activities.

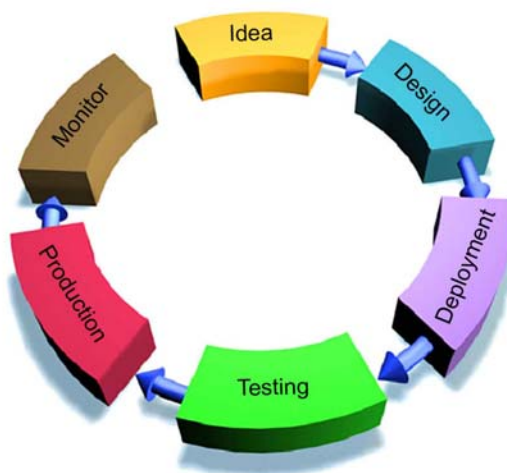


Figure 16 – Business processes life cycle

MINDBill Interfaces

The MINDBill platform is built as an open platform, for easy integration with the existing Operations and Business Support Systems (OSS/BSS). The solution is equipped with a comprehensive set of APIs that cover all CRM needs, business rules and reference data. The interfaces are based on open standards, such as SOAP/XML and J2EE, and out-of-box middleware support (CORBA, Tibco, etc.). In addition, import and export utilities enable en-mass updates toward external systems. These characteristics enable easy integration with multiple OSS/BSS, including billing, fraud prevention, lawful interception and data warehousing.

The Billing API handles account, account-service and payment-related functions. Using this API, any external application, irrespective of platform, can create, update, or query accounts, account services or payment details. MIND's billing API can be used by any third-party application through HTTP requests in standard SOAP protocol. The data is expressed in standard XML format. The application that uses the API can be located anywhere, locally or remotely with Internet or intranet connections to the API server.

The MIND Report Generator

MINDBill incorporates a flexible report generator (Crystal report) for operators to create, manage, and display the required information on specific activities. The standard reports available in the MINDBill system enable the operator to categorize the customer data and analyze revenue, profitability, traffic, aging debt, CRM and offer financial reporting needed for a dynamic business environment.

MIND's standard reports include A/R reports, G/L reports, Agent Commissions reports, calling cards lots usage, and inter-billing settlement reports. All of the business aspects can be summarized and broken down to the necessary resolution like day, month, market segment, product catalog, etc.

Standard reports may be customized and new reports may be created based on the service provider business needs.

MINDBill Business Intelligence (BI)

The MINDBill comprehensive Business Intelligence (BI) tool is a significant and powerful solution for the service provider in analyzing its revenue channels and cash flow, providing on-line assistance for correct business decisions. It can be quickly integrated into existing environments, providing the information needed to drive the business forward as quickly as possible.

The MINDBill BI tool enables users to understand the past, monitor the present and predict outcomes as one moves his business ahead. It integrates data from across the enterprise and provides self-service reporting and analysis at everyone's fingertips, so decision makers spend less time looking for answers and more time driving strategic decisions. This makes it easier to share consistent, holistic views of the business and enhances decision-making abilities.

This tool also offers an integrated, robust and flexible presentation layer for the full breadth of MINDBill BI analytics capabilities, including statistics, data and text mining, and optimization – all integrated within the business context for better, faster decision making.

The BI platform provides drill down analysis to all sales, finance, and traffic information.

The analysis of the packages sold, promotions and campaigns will contribute not only to the overall revenue but also to an increase in customer satisfaction, while

the ability to drill down to sales details per market, store, and sales person provides key detailed measurements that can turn to revenue in a short time.

Top 10 Sales

Store Name	Quantity sold	Sales revenue
Loff Thrift Store	4,680	85,199.18
Ace Cell Store	1,849	38,725.3
Mobile Service Store	1,557	30,976.77
Agis Partners, LLC	951	17,391.77
EC Music & More Center	862	16,529.95
Apb Music Store	317	6,224.52
Green's Mobile Mall	113	1,901.23
2304 Sawtelle Office Store	74	1,579.84
Craft & Carving Cell Phone Store	138	1,192.62
Bill's Goods Center	20	274.95
Total	10,561	199,996.12

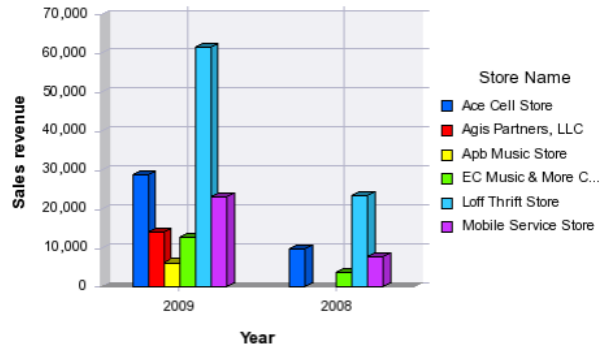


Figure 17 – Business Intelligence

The finance analysis provides indications of the A/R collection and cash flow status, enabling the service provider to have real and correct understanding and, when needed, allows him to deduct corrective actions.

The BI traffic analysis includes both a real-time dashboard that provides live status of the traffic allowing the service provider to always be in control, and a self-customized intuitive reporting tool for generating any traffic report based on any criteria, such as service, trunk and organization.

SNMP and Monitoring Tool

The critical MINDBill components externalize their status using SNMP traps.

MIND's Monitoring Tool Suite (MMTS) is 24x7 operational control and proactive monitoring of the entire MINDBill system (hardware and software) based on Nagios, AWStats, n2rrd, Jopr, NagVis, NSClient++, NRPE, WMI and SNMP.

The MMTS provides:

- **Comprehensive Monitoring** of all the mission-critical infrastructure components including MINDBill applications, services, operating systems, network protocols, system metrics, and network infrastructure.
- **Visibility:** Provides a central view of your entire IT operations network and business processes.
- **Awareness:** Alerts are delivered to the IT staff via email and/or SMS. Multi-user notification escalation capabilities ensure alerts reach the attention of the right people.
- **Problem Remediation:** Event handlers allow you to automatically restart failed applications, services, servers, and devices when problems are detected.
- **Trending and Capacity Planning:** Allows organizations to plan for infrastructure upgrades before outdated systems catch them by surprise.
- **Reports:** Ensure SLAs are being met, provides historical records of outages, notifications, and alert response for later analysis.

Commercial Technology

Platform Independence

Since MINDBill is fully developed using Java, it runs on any standard platform. It runs on SUN, IBM, HP or Intel HW. It supports SUN-Solaris, IBM-AIX, HP-UX, Linux, and Microsoft Windows operating systems, and it can be deployed on JBoss application servers.

3rd Party Products

When required, MINDBill comprises 3rd party products where each is a leader in its area. For example: the Oracle database server, the Sun Cluster or the VERITAS Cluster Managers, JBoss application servers, the JBoss jBPM workflow engine, etc.

MINDBill Physical Architecture

Below is a diagram that demonstrates a physical architecture example of MINDBill:

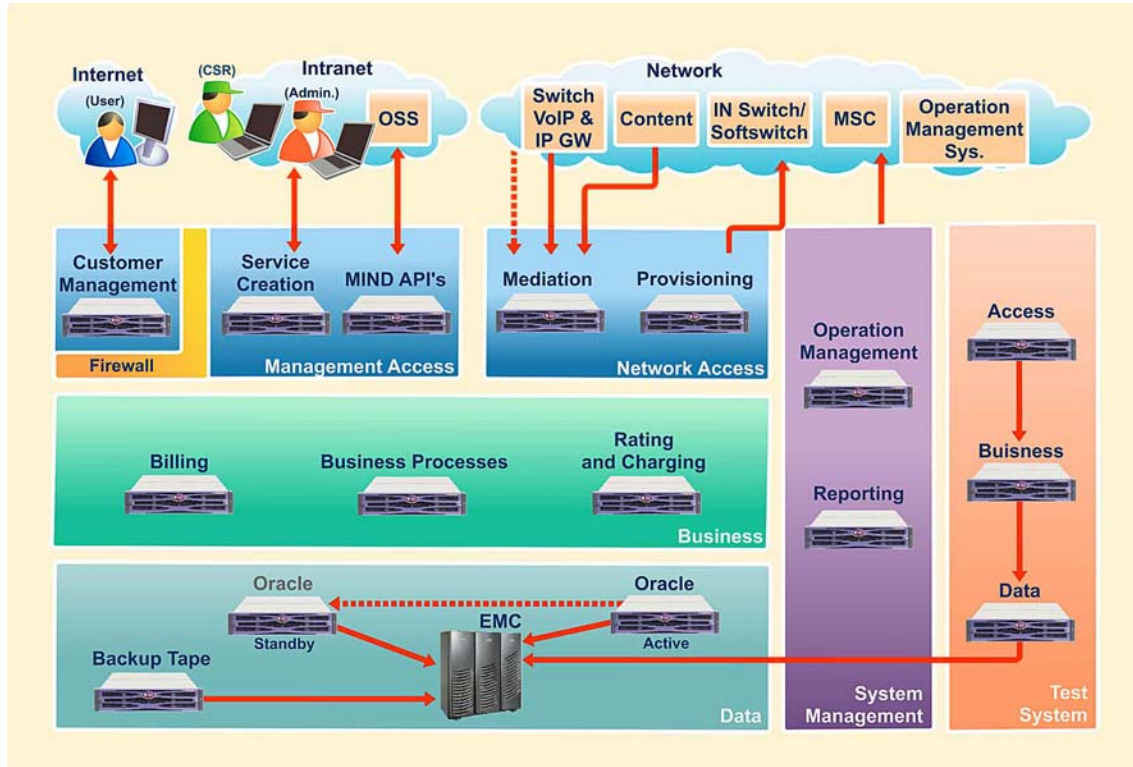


Figure 18 – MINDBill architecture

Machines

As has been stated above, the MINDBill architecture is modular and scalable. MINDBill modules can be co-hosted on very few physical machines, as seen in the “Test system” (diagram above). Also, each module can be spread on a designated group of servers as capacity, availability, and security requires.

Storage

MINDBill recommends hosting its data on SUN Storage or EMC. It can also use customer’s storage facilities (as long as they are certified by Oracle).

Networking

MINDBill does not come off the shelf with Firewall or Load-balancing (LBA) for external access to the system (e.g. in the diagram above, Web access from the Intranet to “Customer Management”) if the capacity or redundancy requires multiple nodes. If the customer’s networking topology requires, MINDBill machines can be spread between the different network zones (e.g. DMZ, Secure zone, Data zone, etc.).

Scalability and High Availability

MINDBill’s modular and scalable architecture allows the system to grow with the service provider. Scalability is achieved by “scale-out” (adding more servers) or by “scale-up” (adding CPUs or the upgrading the existing servers with more powerful HW).

MINDBill provides a solution with built-in redundancy and high-availability (HA) architecture. It is reliable with no single point of failure, guaranteeing uninterrupted service for mission-critical systems. All servers are data-less hence load sharing and HA are obtained using the N+1 architecture. MINDBill Data Servers HA are based on Oracle's Parallel Architecture and Clustering. MINDBill supports standard cluster management systems such as the Sun Cluster and the VERITAS Cluster Manager.

Audit Trail

The system audit (SA) records all system level operations. The list of SA entry types covers the auditing areas required: application start/stop, user logon/logoff, Processes start/stop, and configuration changes. It includes audit-trail of all MINDBill applications, system and billing administrators' actions that are not account-specific. An SA entry may contain additional process-specific information – e.g. the automatic account creation will provide the number of accounts that were created. Supported configuration operations include all Manager and Administrator menus: Tariffs (tariff definition only), Products, Services, Gateways, Sites, Agents, Security groups, Providers, Currencies, Tax settings and rules, G/L settings and rules, Billing Cycles, Invoice configuration, Banks, Credit cards.

Summary

MIND (NASDAQ: MNDO) is a global provider of real-time mediation, rating, billing and customer care solutions for prepaid and post-paid voice, data, video and content. The company's solutions are deployed by telecommunication companies, ITSPs, ISPs, ASPs, enterprises, governmental bodies and financial institutions.

MINDBill is a convergent end-to-end billing and customer care solution that facilitates voice, data, video and content services for both prepaid and postpaid subscribers for mobile, broadband and wireline services providers, enabling the deployment of new revenue increasing services in the shortest time possible. The MIND solution gives providers the flexibility and reliability needed to increase customer satisfaction and profitability, while reducing the cost of ownership and operations and ensuring a fast return on investment due to its end-to-end capabilities combined with a modular architecture and cutting-edge technology.

MIND provides sales and support to its worldwide customers from offices in the United States, Europe and Israeli headquarters. MINDBill has a track record of over 100 successful installations. Service providers working with MINDBill found it to be a reliable tool that offers a fast return on investment and gives them the flexibility needed to meet any market demand. All these, together with the constant commitment toward quality and efficiency, make MINDBill the solution they need to move forward.

To learn more about MIND CTI, please visit www.mindcti.com or call a MIND representative.