



Telephony Billing

Definition

In telephony, billing involves gathering data for customer use and the provision of features, calculating costs, and invoicing for payment.

Overview

The Federal Communications Commission (FCC's) deregulation of the telecommunications industry in 1996 has had, and will have, far-reaching effects for telecommunications service providers. Competition is leading to newer, more innovative services, which in turn puts more pressure on systems to provide and bill for these services.

Deregulation has also allowed companies to provide services beyond their standard line of business. Wireline, wireless, and long-distance companies are now permitted to provide the same services as their competitors and venture into other business areas. This freedom to market multiple services across multiple market segments will create business opportunities that are much more challenging to support and operate. Many of the current service-support systems, including billing systems, were designed for the regulated business environment and do not accommodate these expanded markets.

In order to be competitive, companies will need to improve the operational processes they use to provide these new services. The demand for new and more sophisticated products and services and the providers' time to market will drive this marketplace. More than ever, service providers will also need to focus their attention on understanding customers' needs and providing higher-quality services. A company's ability to represent and bill accurately for these newer and more complex services will become a bigger challenge over the next few years.

This tutorial provides an overview of how a basic billing system works, the challenge of changes in a deregulated environment, and the importance of an open architecture for a billing system.

Topics

1. Basic Functionality of Billing Systems

2. Components of a Billing System
 3. Billing System Requirements
 4. Planning
 5. Implementations
- Self-Test
- Correct Answers
- Glossary

1. Basic Functionality of Billing Systems

Billing systems collect, rate, and calculate charges and then invoice for the product(s) or service(s). *Figure 1* depicts a simple billing flow:

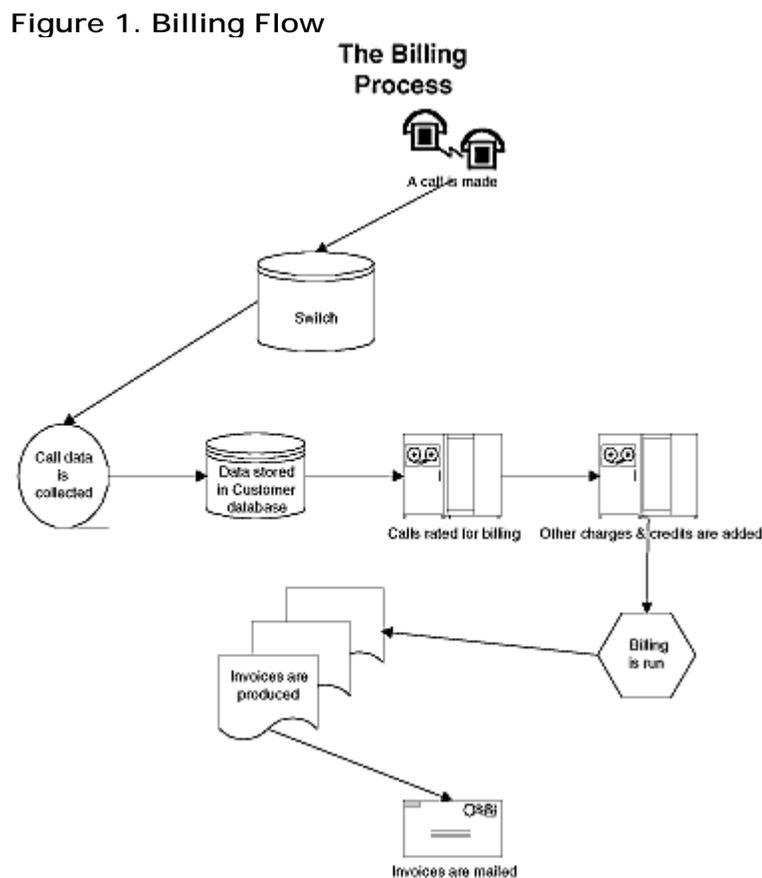


Figure 1 shows that after a call is made, a collector gathers data from the switch and builds a call-detail record (CDR). This CDR must contain the originating number, the terminating number, and the start and end times. The CDR is then stored until it can be rated. To rate the call, the CDR is examined to see if the call

is, for example, an 800 number, a local call that is covered by a local-area calling plan, or a toll call. Information such as the time the call was placed and the distance between callers is also used to calculate the rate for the call. Once each call is rated, this information is stored until the invoice is run, usually once a month in North America. When the invoice is run, other nonusage charges can be applied to the bill, such as volume discounts or monthly fees. This information is then prepared so that it can be printed in a readable form. Finally, the envelope is printed, stuffed with enclosures, and mailed. Call data is also shared between companies to handle calls that originate, terminate, or are transported on another company's network.

Several options are available that change the nature and capability of the billing system. For example, if calls are rated and stored, then an accurate current bill total can be quoted to a customer. Unfortunately, this limits the option to provide flexible ratings based on volume of usage. Another option might be to delete all nonbillable (local) calls as early as possible, which would save significant storage costs. However, that call data might be useful for studying usage patterns.

Issues that must be addressed when managing the billing system are many; reliability, accuracy, and readability are basic needs. Data formats, especially among different billing system components, are a significant source of complexity and expense in any system. Data that is shared is particularly sensitive to compatibility issues. The ability to bill many different services (local and long-distance phone, Internet, wireless, cable TV, etc.) on a single bill has proved difficult; the logic for handling wireless-call billing is very different from the logic of regular fixed-line billing. Integrating this logic into a single application is quite complex and requires skills in all media. Increasingly, this capability will be a differentiator in billing solutions over the next few years.

2. Components of a Billing System

A billing system is composed of a series of independent applications that, when run together, are referred to as the billing system. Its major components are as follows:

- **CDR**—This is used to record the details of the call. Usual information on a CDR includes start time of call, end time of call, duration of call, originating number, and terminating number. The CDR is stored until time of billing.
- **guiding**—This matches calls to customer calling plans. The application uses the start and end number and the duration and time of call to decide what the charge should be, based on the calling plans on the customer's record.

- **rating application**—This program applies the rate for the individual guided calls. Rating gives the call a value to be charged at the time of billing (not including any promotions, discounts, or taxes).
- **billing**—This is usually performed once a month. This job collects all of the rated calls that have been stored over the past 30 days. The program adds any promotions and discounts that are associated with the customer account. For example, if customers have called over a certain number of minutes, they might get a volume discount. In addition, taxes and credits are applied.
- **invoicing**—When the billing job is complete, a file is created that includes all of the customer's information. This file is sent to a print house to be converted to paper invoices. These invoices are then stuffed into envelopes, along with specific inserts targeted to the customer. Many companies will also create electronic statements and send customers their invoices via diskette, tape, or even e-mail; alternative billing practice is especially common for business customers.

3. Billing System Requirements

The following are standard telephony requirements used when issuing a request for proposal (RFP) for a new billing system or an enhancement to an existing one:

- **customer-interface management**—The billing system must be able to handle customer-initiated contact, oversee outbound customer contact, and manage the contact life cycle.
- **sales and marketing**—A satisfactory billing system should answer customer query, handle commissions, provide sales support, track prospects, manage campaigns, analyze product performance, and acquire multiple dwelling units (MDUs).
- **order handling**—It is crucial that the billing system maintain customer-account information, manage the order-entry life cycle, and oversee the order-completion life cycle.
- **problem handling**—Billing systems should also be able to manage trouble-ticket entry, coordinate trouble-ticket closure, and track the resolution progress of a trouble ticket.
- **performance reporting**—A satisfactory system will provide performance reporting, ensure quality-of-service (QoS) reporting, create management reports, and generate regulatory reports.

- **invoicing and collections**—It is important that the system perform billing inquiry, generate bills, handle collections, process deposits, perform account administration, maintain tax and fee information, process financial information, and manage customer-premises equipment (CPE) inventory information.
- **rating and discounting**—Billing systems must manage products and services, coordinate rate plans, and rate customer-usage records.
- **installation and maintenance**—The system should also provide workforce scheduling and manage activities performed at the customer premises.
- **usage and performance data collection**—An adequate system will collect data and handle interface from other providers.
- **information-systems management**—Billing systems might also be called on to perform configuration management, ensure security management, oversee fault management, monitor performance, and manage accounts.
- **systems architecture and environment**—A billing system should perform data audits and integrity checks and ensure year-2000 compliance.

4. Planning

Plan the Planning Effort

It is vital to understand what it is that is being planned. The company is not simply planning for a type of technology improvement but, rather, for the new business process that supports the change. Companies must plan for the way people will react to the change, and probably most importantly, they must plan for the way customers will react to and accept the change. It is crucial to understand the value that any change will bring to customers.

Deciding Scope

It is crucial that the company determine the scope of the project before planning. Questions to be asked include the following: Is this just billing, or does it include customer care and a whole new operations support system (OSS)/base-station system (BSS) infrastructure? What part of the business is to be supported? Why is the company making the change?

Setting Business Objectives

Companies should follow rules for good objectives: SMART criteria. They should also know what to do if the company does not meet business objectives. What are the trigger points for the project? What kinds of things would make the company cancel the project? If, \$200 million into the project, it becomes clear that the project will exceed the budget by \$200 million, is that the time to stop?

Forming the Team

Select a leader who has great access to resources. Ask them to define their roles and, more importantly, the roles they will want other team members to play.

Scheduling

It is important to be conservative. Once dates are mentioned, there will be little room for maneuvering.

Developing an Execution Model

Know what it is that the company would like to execute. Although it may seem to be simply the implementation of some hardware and software, customers will probably believe it is a new way of doing business. Find out the company's business objectives. Many expect the technological change being implemented to affect the business in a myriad of ways. Rather than deny that it is possible to have the impact the customer expects (as many information technology [IT] professionals do), work with the customer to outline a plan that can enable both organizations to achieve the customer's goals. Questions that can help develop an effective execution model include the following:

- How will the end result come together?
- Will there be an integrator or a software package?
- How much will be kept in house?
- What is the implementation time frame?
- How can achievement of the client's goals be assured?
- Is this too big to implement all at once? If so, what is the phasing strategy?
- How will changes be made throughout implementation? After implementation?

- Are the communication efforts included in the plan clear, consistent, and focused?
- Have the users been included in the effort? Does it look like an afterthought? If so, it probably is, and the clients will notice.

Conducting the Planning Effort

Developing Requirements and Solution Architecture

Unfortunately, rather little effort is devoted to developing requirements these days. Best practices often mean that a company would rather use preexisting requirements than develop its own. This can speed up the time to implementation, but there is still important work to be done. When companies decide to use best practices, this means software will not be customized. Instead, business practices must be altered to fit the software; then the requirements shift from software requirements to business performance requirements. Figure out what processes must be changed and how they will be changed. Customers should not be expected to know how to change their own processes or even to know that such change will be necessary.

Finding and Working with Vendors

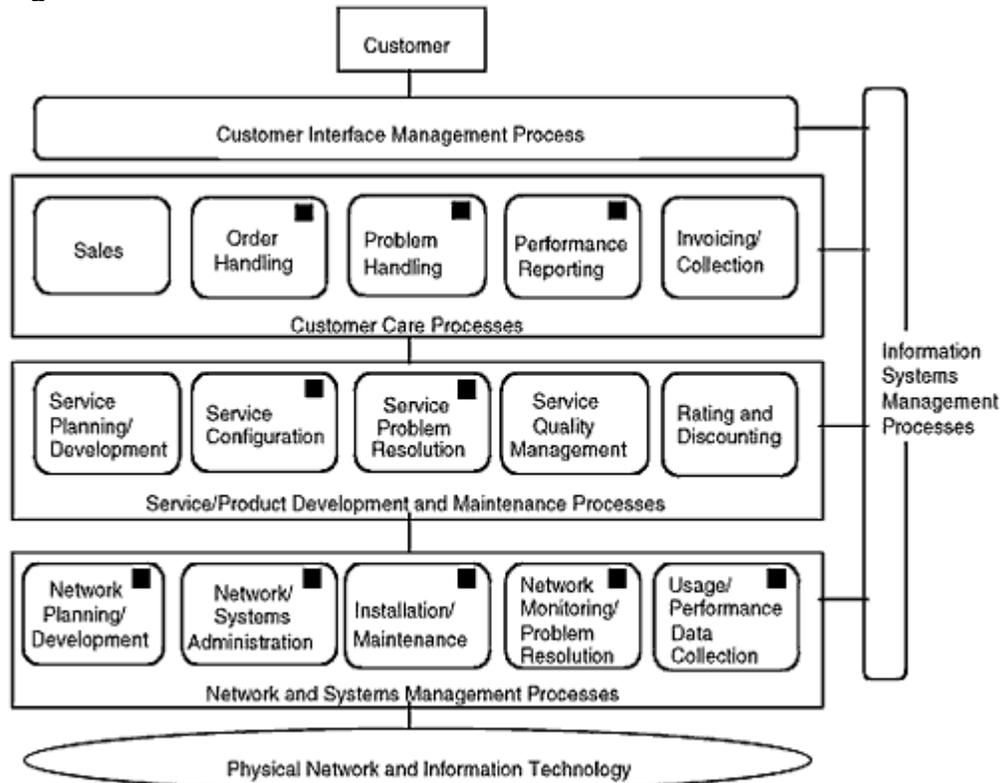
Many companies begin with the assumption that a premade system will work. This solution is appropriate for certain environments, but companies must find out who the best vendors are for their billing needs. Invite vendors to the company during the preplanning and planning phases of the project. It is important to understand how the software works and what it will bring to the business. Perhaps more importantly (as solutions become more focused on a single, convergent theme) what is the value-add each vendor will bring? Can the vendor bring business processes to the party? Can it customize business process for a specific company? What kind of legacy does it want to leave for the company?

It may cost money to find answers to these questions. Because of the competitive nature of today's marketplace, technology companies are reluctant to place personnel on site for more than a day or two when they could be billing elsewhere. Consider a small, two- to four-week engagement so that the company can assess the provider's ability to work with the project team. While such an engagement can cost several thousand dollars, when considered in the overall context of the project, it makes good sense.

5. Implementation

Figure 2 depicts the Network Management Forum (NMF) simplified diagram of the business processes used by a typical phone company. The boxes with the black indicator in the upper corner of Figure 2 represent processes not usually associated with billing.

Figure 2. NMF Business Process Model



During an implementation, these processes aid in understanding the course of action. It is also important to keep the following in mind:

- **leveraging existing IT investments**—This saves time and money. Most companies have good IT processes in place that, when executed properly, will ensure a smooth implementation. It is necessary to evaluate and modify these processes to incorporate any streamlining or efficiencies that are introduced by the new application.
- **ensuring interoperability with other applications and platforms**—This can be one of the most difficult and time-consuming tasks of any new billing implementation. Most billing systems have standard protocol for sending data to and receiving data from the application. However, failure to allow for an appropriate test plan or

testing time frame will result in a poor outcome that could hamper production time.

- **leveraging the Internet**—The Internet is new to billing applications and is a tool that can keep any company closer to its customers. With the proper training and an initial pilot rollout to a carefully selected handful of test customers, Internet billing can prove to be a cost-effective means both to bill and to please customers. However, Internet billing cannot be expected to be warmly received by all customers. Research should be performed in this area to determine which, if any, customers would embrace this form of billing.
- **implementing reusable technologies and components**—It is important not to throw away good systems or applications hastily. A cost-and-benefit analysis should be performed to determine if the changes necessary to the legacy components and systems are more effective from a cost, feasibility, and future-use perspective than purchasing or building new technologies and components.
- **building an architecture that is durable**—A durable architecture is one that withstands the test of time. The architecture should be flexible and layered with clear separation of services, business and application logic, and data access. This will ensure plug-and-play readiness should better pieces of the solution become available during the life of architecture.

Self-Test

1. Because of their static architecture, billing systems are rarely used for anything other than billing.
 - a. true
 - b. false
2. Billing systems collect, create, and calculate charges and then invoice for the product(s) or service(s) used.
 - a. true
 - b. false
3. It is relatively easy to bill for a variety of services on one invoice.
 - a. true

- b. false
4. Today, companies can send bills via e-mail, diskette, or tape.
- a. true
 - b. false
5. Billing systems often oversee a variety of functions but usually are not used for customer service.
- a. true
 - b. false
6. A sampling of functions performed by a billing system include _____.
- a. customer-interface management, sales and marketing, and problem handling
 - b. order handling, performance reporting, and invoicing and collections
 - c. rating and discounting, installation and maintenance, and information-systems management
 - d. none of the above
 - e. all of the above
7. The primary function of a billing system—namely invoicing and collections—includes the following:
- a. bill generation
 - b. deposit processing
 - c. tax-and-fee information maintenance
 - d. collections processing
 - e. a and d only
 - f. all of the above
8. A billing system is composed of the following applications:
- a. surveying, data entry, and billing

- b. rating, guiding, and billing
 - c. CDR, guiding, and data entry
 - d. invoicing only
9. The difference between billing and invoicing is the following:
- a. there is no difference
 - b. billing refers to private customers; invoicing refers to corporate customers
 - c. billing is the rating of calls; invoicing is the process of sending a physical invoice
 - d. billing occurs in 30-day cycles, whereas invoicing happens only twice a year
10. Important elements to consider when planning a billing system include _____.
- a. deciding on the size and scope of the system
 - b. setting a firm date for completion of the project
 - c. selecting which ready-made system will best fit the company in question
 - d. none of the above
 - e. all of the above

Correct Answers

1. Because of their static architecture, billing systems are rarely used for anything other than billing.
- a. true
 - b. false**
- See Overview.

2. Billing systems collect, create, and calculate charges and then invoice for the product(s) or service(s) used.

a. true

b. false

See Topic 1.

3. It is relatively easy to bill for a variety of services on one invoice.

a. true

b. false

See Topic 1.

4. Today, companies can send bills via e-mail, diskette, or tape.

a. true

b. false

See Topic 2.

5. Billing systems often oversee a variety of functions but usually are not used for customer service.

a. true

b. false

See Topic 3.

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See Topic 4.

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- d. none of the above
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See Topic 4.

Glossary

BSS

base-station system

CDR

call-detail record

CPE

customer-premises equipment

FCC

Federal Communications Commission

IT

information technology

MDU

multiple dwelling unit

NMF

Network Management Forum

OSS

operations support system

QoS

quality of service

RFP
request for proposal