

Best practices in revenue assurance



Revenue assurance: to assure the correct billing of all transactions, products and services provided by the telecom operator according to established agreements and the applied tariffs and to assure minimum loss due to bad debt and fraud.

There is no question about it; revenue assurance is a massive task! No matter what kind of situation you find yourself in, if you have made it your responsibility to try to detect, remedy

Atlas or Archimedes – whose approach will you choose?

and prevent revenue leakage amidst the vast collection of network switches, cables, intelligent network programs, IP packet accounting, mediation and billing systems that make up the modern telecommunications company infrastructure, than you have certainly taken on a lot of responsibility.

There are a lot of opinions about how best to organize the revenue assurance (RA) function. To whom should the RA group report? How should it be measured? What is its primary function? But at the end of the day, the job is still the same. Somehow, you have to figure out how to find places where the existing systems, operations and procedures are breaking down and revenue is being lost – which is not as simple as it seems.

For the newcomer, taking on the RA job might appear to be simplicity itself. You have a collection of systems all dedicated to the capture, transformation and processing of transaction data. These systems have been built specifically for that purpose, and in general, most of them have been running successfully for years. Obviously they work; otherwise the telco would not be making money.

So just exactly how big can the RA job be? One approach is just to do occasional audits in order to make sure there are no glaring errors (the internal audit approach). Or if you are really desperate, just “buy a system” that does it for you (the software-can-fix-anything-if-you-pay-enough-for-it approach). Unfortunately, as appealing as these solutions might appear, neither will help you to accomplish your objectives in the RA area for any length of time. Each of them is, unfortunately, a temporary stopgap, an attempt to plug the hole in the dyke: none of them actually addresses the core underlying problem, and each approach is based on false assumptions about what the problem is all about.

People grossly underestimate the scale of the revenue assurance challenge, and this leads them to tackle it in a haphazard and partial way, leaving them with more problems than they started with. In order to develop an appreciation for the size and scope of the job, we need to start with a basic understanding of the telecommunications business itself.

The revenue management chain

Telecommunications systems are so big, so complicated and so obscure that there are very few people that really understand how all the pieces fit together. Just to get an overview of one part or one system within a telco's business requires an understanding not just of complex technologies, procedures and protocols but also of a unique management style, lexicon and way of doing things. And the first thing that you have to do in order to figure out the RA job is to define exactly which of these systems – there could be several of them – are involved.

In order to help organizations to get an understanding of the breadth and scope of RA, I developed a diagram known as the revenue management chain, which shows each of the different systems involved in RA and how they relate (see Figure 1).

Lots of complex systems working together... imperfectly

As Figure 1 shows, the core revenue management systems that drive the telco comprise the network itself (including all of the switches, routers, cables and everything else that makes it possible to deliver services), a mediation system, and a minimum of four billing systems (prepaid, post-paid, interconnect and roaming), each of which has its own set of logic and processing rules, and its own collections and late collections (dunning) processes.

Wow. Just imagine how many systems we are talking about here. In the network area alone, thousands of devices are involved in the process, and in the typical telco there are dozens if not hundreds of systems and devices involved in the mediation and billing steps.

call that anyone makes, for each SMS message sent, and for each Web page downloaded a number of different transaction records must be collected and processed in order to bill for them correctly. It is virtually impossible to grasp the size of the data volumes that flow through these systems each day. Telecommunications systems must function at an incredibly high speed in order to keep up with the high rate of transactions flowing through them. And the volumes of data are so great, that telcos cannot afford to store more than a small fraction of the total.

Whereas other industries can save multiple copies of transaction data, giving them the comfort of knowing they can always go back and check things when problems arise, telcos have no such luxury. In telecommunications you have to do things fast, and do them right the first time.

So RA really *is* a big job. It requires that you keep track of billions of transactions crossing hundreds of systems, devices and operations and assuring that each and every one of them is handled with 100 percent integrity. That brings us back to the question, "which approach works best?" Well you have two choices: the Atlas approach or the Archimedes approach.

The Atlas approach

In Greek mythology, Atlas was a member of a race of giant Gods called the Titans. When the Titans were defeated in their war with the Olympians, Zeus condemned Atlas to stand at the edge of the earth and hold up the heavens on his shoulders. You can certainly approach RA in the same way: you burden the revenue assurance manager with responsibility for every single system across the environment, and for every single transaction.

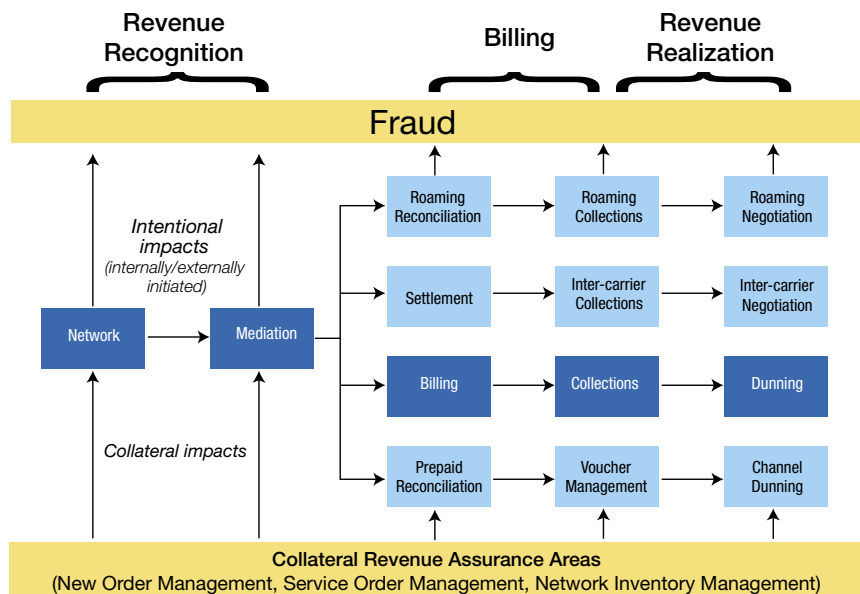


Figure 1: The revenue management chain

But here comes the real killer: what makes this environment too difficult to manage is not the number of systems, but the number of transactions that must be processed. Each day, telecommunications systems process billions and billions of transactions. For each phone

While this is certainly a noble objective, there are many reasons why it is impractical. First of all, in order to truly assure every transaction every time, you would have to, in effect, recreate each of the systems across the revenue management chain and double check their performance in parallel. You would need to double the disk space, double the computer power and double the logic of the core systems in order to do your checking.

In reality, this is just too expensive to be an option.

Secondly, the Atlas approach ignores the fact that the underlying systems that make up the telecommunications environment are constantly being modified and updated. There is no way that you could ever keep pace with these changes.

The Archimedes approach

While most people who take on the RA challenge start with the “brute force” of the Atlas approach, they very quickly start looking for a less tiring way get the job done. The ancient Greek scientist Archimedes famously said, “If you give me a lever long enough I could

Business intelligence

More and more carriers are realizing that they already have a set of tools and systems that can be leveraged in order to help with the RA job. They are often the same tools and systems that they have used to solve myriad other operational problems. Consider the attributes required of a tool that will give us the necessary leverage. It has to be able to:

1. Deal with incredibly high volumes of data
2. Extract data from an incredibly diverse assortment of data sources quickly and accurately
3. Condense high volumes of data into high-level, compact and meaningful reports that provide useful information and insight
4. Be deployed and redeployed quickly in response to changing business conditions
5. Derive meaning from the data extracted from operational systems *without hindering* those operational systems

If you consider this list, it is clear that the lever you require is business

intelligence. At first, many people are confused by this statement and say, “How can you possibly use business intelligence to solve revenue assurance? BI is great for marketing and credit scoring, but how can it possibly help with the ‘heavy lifting’ associated with RA?” This confusion typically arises because people misunderstand the nature of revenue assurance, or

alternatively they associate BI with particular applications, rather than considering the underlying functionality of business intelligence.

Until recently, RA has been nothing more than a loosely defined collection of random audits, checks and customized applications, all attempting to address different aspects of the much bigger overall RA problem. Because of this, it was almost impossible for anyone to take a step back and get the bigger picture of what was really involved in performing RA.

In an effort to combat this shortfall, I created a methodology known as MBASIC. MBASIC stands for Monitoring, Baselineing, Auditing, Synchronization, Investigation and Compliance and it represents what I consider to be the core functions that make up the RA job. If you do these six things, then you are doing RA. Let’s consider each of them in detail:

Monitoring is the process of checking all of the inputs and outputs from each of the systems within the revenue management chain and ensuring that everything that goes in is accounted for at the other end. Of course if there were a comprehensive monitoring function performed across the entire organization, then there would be no need for RA at all.

Baselineing is the creation of revenue management scorecards (high level trend and tracking reports that allow top management to see, at a glance, how much revenue is flowing through the systems, and how much risk of leakage each area holds at any given time).

Auditing is the process of systematically verifying all of the processing steps within a particular operation on an ad hoc basis.

Investigation is the process of back tracking individual transaction records and uncovering the root causes for leakage occurrences.

Monitoring with BI is fast and efficient, but even more important is the fact that you do not have to buy separate systems. All you need is some disk space and you can instantly create monitoring reports for any operational system.

lift the world with one hand!” And that is exactly what we have to do with our revenue assurance: get enough leverage to make the task easier. We need to identify the tools that we already have to get the job done more effectively.

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Compliance is the process of making sure that the other RA functions are being performed on a regular and accurate basis.

If you look closely at any RA situation where leakage is uncovered you will most likely find that they fit very neatly into these six categories.

Given these functional requirements, how exactly can you leverage business intelligence to get the RA job done on time and at a reasonable cost? Let's consider a few situations.

Using BI to monitor operational systems

By far the most obvious and powerful application of business intelligence in RA is to monitor existing revenue management chain systems. Each of the systems along the revenue management chain has an incredibly high number of call detail records (CDRs) that must be read, processed and output to downstream systems on a daily basis. It is not uncommon for these systems to lose or "misplace" those records. This is a bad turn of events since each CDR represents a billable transaction, so each CDR that you lose means lost revenues.

Monitoring these operational systems with BI tools is actually a simple process. The formula $A=B+C$ is what you need to remember to guarantee processing integrity: A represents the CDRs in the input stream, C represents the CDRs in the output stream and B represents the sum total of CDRs that were not forwarded by the system for one reason or another. So, all we have to do is create three tables. Table A holds a copy of all input records; Table B holds a copy of all output records; and Table C holds a copy of all of the rejected or suspended records (see Figure 2).

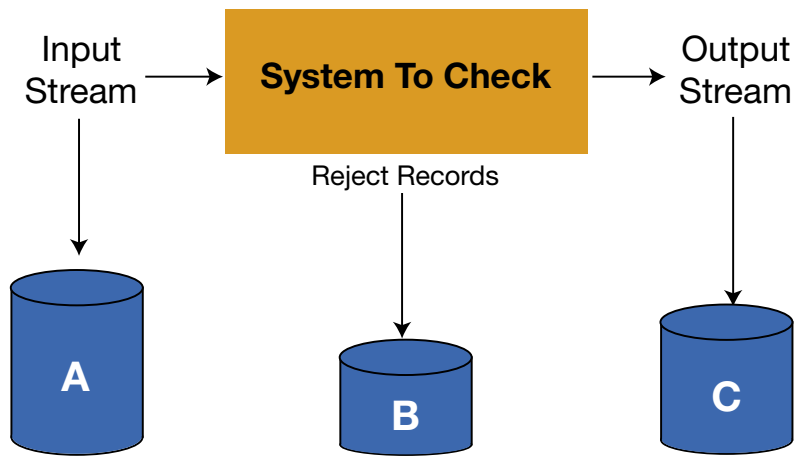


Figure 2: Monitoring operational systems using the $A=B+C$ formula

Once the three tables are loaded, you can use a simple comparison function to identify any records that were not forwarded in the way that they should have been. The actual RA checks involved in this process vary according to the system, and you can check the number of CDRs, their time value and monetary value using the same data and tools. Once the data is loaded it is very easy to perform any of the checks with a simple, straightforward set of queries and/or reports.

Monitoring with BI is fast and efficient, but even more important is the fact that you do not have to buy separate systems. All you need is some disk space and you can instantly create monitoring reports for any operational system. In fact you can do the monitoring report and then free up the disk and CPU to be reused to monitor another area, all without changing any of your core systems or technology.

Baseline reports and audits

The creation of scorecards and baseline reports is one of the jobs that BI does best. Some organizations have found that business intelligence tools can even help them when they run audits. Sampling techniques are used on the data within the systems being audited, in order to be sure that appropriate sample sizes and populations are selected. Then data mining and other analytical techniques are used against that data in order to accomplish the objectives of the audit.

Synchronization

Synchronization is actually one of the most fruitful of revenue assurance activities. Proactive organizations make use of synchronization tables and reports, built on their existing BI platforms, in order to assure that different sources of data (home location register (HLR), billing system, network reference tables) are making values for key fields.

While monitoring and auditing help to discover leakage, synchronization systems prevent it. By ensuring that reference data is aligned between systems, RA teams can guarantee that billing operations proceed quickly and

with the minimum of errors. Building BI-based synchronization is similar to the monitoring technique. In this case, two sources of data are identified (the two areas that we are interested in synchronizing). Data is copied from each of these systems into separate tables, and then comparisons are run to be sure that all values match.

When mismatches occur, synchronization error reports are dispatched for follow-up by the responsible operational managers.

BI practitioners with knowledge about each of the core operational systems are of inestimable value and will accomplish their jobs in a fraction of the time that someone without access to BI tools and techniques could hope to achieve.

Investigations

There is no area where business intelligence is going to be more helpful than in investigations. The job of the investigator is to pore through millions of records, looking for the matches or anomalies that indicate operational problems. BI practitioners who combine their knowledge with knowledge about each of the core operational systems are of inestimable value and will accomplish their jobs in a fraction of the time that someone without access to BI tools and techniques could hope to achieve.

Leverage BI for RA today!

In this article, I have attempted to review, at a very high level, why business intelligence environments are being selected more and more as the platform of choice for addressing revenue assurance problems. Many RA groups have found that their companies already have a BI infrastructure including data warehouses that hold a significant amount of the data that required in order to get RA activities underway, without the need to invest in additional hardware or soft-

ware. Many are also finding that they have a rich pool of resources and skills that can help them quickly diagnose and address existing problems in a fraction of the time they thought necessary to get the job done.

As the revenue assurance function continues to expand, I am sure that we will see a lot more cases of well-executed revenue assurance programmes using powerful BI technologies. ■



For more information about revenue assurance best practices, you can download a free copy of Rob Mattison's book *The Telco Revenue Assurance Handbook* at www.rabook.net

For more whitepapers and information see: www.telco-revenue-assurance.com



BIO

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Rob Mattison is a globally recognized expert in the application of business intelligence to telco operations. He has provided assistance to carriers around the world in establishing, running and improving their revenue assurance activities.