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AGILE DECISION MAKING
IMPROVING BUSINESS RESULTS WITH ANALYTICS

Executive summary

While analytics are getting a lot of attention these days and hold the potential to deliver great value, service providers have struggled to realize their full value. In a session at TM Forum’s Management World 2011, led by industry analyst Larry Goldman, Alain Glickman of Orange and Dr. Lorien Pratt of Quantellia, a group of executives explored how and where analytics fit within the broader decision-making process, as well as how today’s analytics might be evolved and positioned to provide greater value.

Much of the decision-making discussion centered on the gap between tool and data providers and decision makers. Many of the tool and data providers, recognizing the inherent value of their assets, have a tendency to see things in terms of the analytical results (the numbers) and want to incorporate these routinely into decision-making processes. Many users feel that this approach de-emphasizes the focus on the business problem itself.

Exacerbating the problem, the deluge of data is resulting in ‘paralysis by analysis’ or, even worse, bad or sub-optimal decisions. This phenomenon is well documented in Kathryn Begley’s excellent piece in Newsweek magazine on February 27, 2011 entitled ‘I Can’t Think.’ A different, more top-down approach to decision making was recommended, starting with the decision maker, understanding how human thought processes work and using decisions as focal points rather than shaping the solution in the context of the tool.

After all, while success with analytics requires appropriate data and skilled analysts to interpret results, without a clear understanding of the business goals and subtleties, and a focused yet holistic decision-making process in which to operate, decision makers are prone to wallow in a data quagmire, distracted by the sheer number of options available to them.

There are a number of additional challenges to the decision-making process, including:

- The impact of poor quality information
- The difficulty of correlation of data from multiple sources
- The inability of traditional data models to accommodate new services analysis
- The sheer growth of raw data, especially from IP networks and social media sources
- The intimidation factor of the deluge of data available in the communications industry and its overwhelming impact on newer decision makers.
- The increasing pressure to make decisions quickly, driven by the speed of change, and the expectations of the social media audience
- The struggle for inexperienced analysts to add significant domain expertise to the decision making process
- The problem of communications or presentation skills among analysts.

Finally, the gap between service providers and analytical applications suppliers is significant. Service providers feel that the vendors should understand their needs, be able to create or identify best practices in meeting those needs and offer solutions reflecting those best practices. Vendors for their part are looking for service providers to step up and prioritize. They say it can be very difficult to gain access to service provider personnel to understand the problems in detail, and even the service providers themselves admit that they don’t know what they want and cannot define their problem set “crisply.”

This Quick Insights report covers this, as well as a brief discussion of the emerging field of decision engineering, and suggestions on how to improve the effectiveness of analysis. The paper finishes with a set of broad recommendations for improving success with analytical applications and business intelligence in general. We hope you enjoy it.
Analytics are a set of tools, not an end in themselves

Section 1
Assessing the promise and challenges of analytics

Over the last year or two, the topic of analytical applications, commonly referred to as analytics, has become red hot in the communications industry. Seeking to reduce costs, improve customer service, and generally increase revenues and profits, service providers of all kinds have attempted to deploy various analytics across their enterprises.

Analytics and the broader portfolio of business intelligence (BI) solutions have been deployed in all facets of the service provider, including the network, the support center, the front and back offices, field forces, and the executive suite. They are used to support everything from market demographics to speeding up the release of new products, customer lifetime value, customer retention, pricing plans, offer management, campaign management, revenue assurance, budgeting and investment, network and service performance, social media management and so on.

The portfolio consists of products from specialized BI vendors, to add-on statistics packages from traditional software vendors, to custom or internally developed products.

Clearly, analytics are everywhere. But are they delivering the results envisioned by those who implemented them? In many cases, it’s fair to say that analytics projects have yet to deliver the value hoped for, though no one is ready to give up on them at this early stage.

With all the hype, it is easy to forget analytics are not an end in themselves, but rather a set of tools intended to be used to enable better decision-making. To be valuable, analytics require appropriate data, both historical and real time, skilled analysts to determine which results are most relevant to solving the problem at hand and interpret results, and a focused but holistic decision-making context and process in which to operate.

This was the topic addressed in a recent executive roundtable at TM Forum’s Management World 2011, which brought animated and dynamic discussion among a group of senior executives from service providers, vendors and consultants.

The session – chaired by industry analyst Larry Goldman, who was joined by provocateurs Alain Glickman from Orange and Dr. Lorien Pratt from Quantellia – explored how and where analytics fit within the broader decision-making process, as well as how today’s analytics might be moved to a more appropriately contextual business analytics environment.

The session opened with brief presentations by the provocateurs, covering both theory and practice, suggesting that the scope of the business decision making should be enterprise-wide, and should include both strategic and tactical decisions, as well as automated and non-automated decisions.

The scope of analytics/business intelligence tools discussed was equally broad, including the usual components, such as:

- **Data and text mining** – an iterative process of creating predictive and descriptive models, supporting decision making, by uncovering previously unknown trends and patterns in vast amounts of data from across the enterprise using data, both structured and unstructured.

- **Data visualization and dashboards** – advanced graphical renditions of results of analytics and exploratory data analysis, leading to better analyses, faster decisions and more effective presentations of analytic results. Dashboards in particular often provide simpler, more personalized views of relevant data to improve understanding and evaluation of scenarios.

“Analytics require appropriate data, skilled analysts and a focused but holistic decision-making context and process in which to operate.”
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Forecasting – applying analytical techniques, such as time series, econometric modeling and game theory, to predict outcomes based on historical patterns and scenarios. It can also be used to better understand past trends and model business processes. Operations research can use optimization, project scheduling and simulation techniques to identify the actions that will improve results as well.

Query and reporting – tools that allow analysts and users to link to appropriate data stores to create relevant, timely queries and reports.

Model management – these tools can be used to streamline the process of creating, managing and deploying analytical models, increasing professional productivity, and reducing modeling errors.

Quality assurance/process optimization tools – these can be developed and deployed to identify, monitor and measure the quality of processes over time and apply root cause analysis to complex problems. One of the most important aspects of this area is process optimization; analytical tools can be used to model business processes and measure the effectiveness and efficiency of the end-to-end process, identifying actions that will improve results.

A lack of joined-up thinking

There is a recognized gap between tool and data providers, and decision makers. Many of the tool and data providers, recognizing the inherent value of their assets, have a tendency to see things in terms of the analytical results (‘the numbers’) and want to incorporate these routinely into decision-making processes.

While this is a noble goal, it is often implemented as a bottom-up approach, trying to drive the decision with the data. Unfortunately, the tendency here can be to over-focus on the tool, losing sight of the business goal. Since the tools are complex, they are often used by analysts with excellent quantitative skills, but limited business acumen.

A lack of joined-up thinking

Another common problem here is that business decision-makers can easily be overwhelmed with data. This can cause decisions to be delayed, resulting in ‘paralysis by analysis’. In some cases, decision makers confronted with too much data or too many options are more likely to make bad or sub-optimal decisions. This phenomenon is well documented in Kathryn Begley’s excellent piece in Newsweek magazine on February 27, 2011 entitled I Can’t Think. The following is a brief excerpt from that article:

“Decision science has shown that people faced with a plethora of choices are apt to make no decision at all. The clearest example of this comes from studies of financial decisions. In a 2004 study, Sheena Iyengar of Columbia University and colleagues found that the more information people confronted about a 401K (retirement savings) plan, the more participation fell: from 75 percent to 70 percent as the number of choices rose from two to 11, and to 61 percent when there were 59 options. “People felt overwhelmed and opted out. Those who participated chose lower-return options – worse choices. Similarly, when people are given information about 50 rather than 10 options in an online store, they choose lower-quality options. Although we say we prefer more information, in fact more can be ‘debilitating,’ argues Iyengar, whose 2010 book The Art of Choosing comes out in paperback in March. ‘When we make decisions, we compare bundles of information. So a decision is harder if the amount of information you have to juggle is greater.’

“Indeed, the Oxford English Dictionary added ‘information fatigue’ in 2009. But as information
finds more ways to reach us, more often, more insistently than ever before, another consequence is becoming alarmingly clear: trying to drink from a fire hose of information has harmful cognitive effects. And nowhere are those effects clearer, and more worrying, than in our ability to make smart, creative, successful decisions."

The article goes on to discuss the rise of rapid decision making:

“We’re being trained to prefer an immediate decision, even if it’s bad, to a later decision that’s better,” says psychologist Clifford Nass of Stanford University. “In business, we’re seeing a preference for the quick over the right, in large part because so many decisions have to be made. The notion that the quick decision is better is becoming normative.”

This focus on rapid decision-making further exacerbates the problem, raising the possibility of coming up with a smart, creative decision.

**Using history to predict the future**

An additional common problem with the current tools and processes is the choice of tool or data set used to address the problem. For example, decision makers sometimes use historical information to predict the future in rapidly changing environments. While historical information can be useful, it is a representation of the past, and may not be an accurate indicator of the future. Historical data needs to be taken in the context of the overall problem, and should not be viewed as the final authority in itself. Some brief additional discussion also took place on the Black Swan theory, or the existence of developments or events that lie outside the realm of regular expectations, since nothing in the past can convincingly point to its possibility.

**Holistic decision making**

It is important to take an holistic approach to decision making, looking across ‘silos’ to avoid unintended consequences. For example, making a decision around service quality or pricing might have a positive impact in network operations or product gross margins, but may generate a negative result in customer support. Decisions must incorporate a broad, holistic perspective across the service provider.

**No substitute for human intelligence**

The injection of human intelligence as well as data is essential: while the results brought forth by the tool are important, their accuracy and relevance must be judged by an experienced analyst with strong business acumen if they are to be properly framed in the overall problem-solving process.

Pattern recognition can play an important role as well, especially when decision-making involves the analysis of large amounts of unstructured data, or lots of historical data. Discussing results is of paramount importance: wrestling with the data and injecting practical experience, especially when some of the data important to the decision is missing, can be very effective in shedding new light on difficult problems.

A different, more top-down approach to decision making was recommended, starting with the decision maker, understanding how
human thought processes (brains) work and using decisions as focal points rather than shaping the solution in the context of the tool.

Dr. Pratt briefly discussed a decision model composed of decision levers, external factors, outcomes and goals (see Figure 1).

A similar approach to structured decision-making processes can be found in Decision engineering, (see panel opposite).

**Domain expertise**
Analysts often struggle with adding domain expertise, especially those with less experience. This can result in two problems in bridging the gap between analyst and decision maker. First, the analyst can struggle to find anything like actionable recommendations in the results, rendering the value of the work questionable.

The opposite situation also occurs, where the analyst may read too much into the results, creating perhaps a credibility problem with the decision maker, who may have contradictory experience. Either of these situations can devalue the perception of the tools and the analyst, and potentially lead to a no-decision/bad-decision scenario.

**Poor quality information**
Poor quality information can be a huge problem. Data definitions must be precise and consistent among the various sources. Inconsistent definitions, weak interpretation or poor data transformation techniques among disparate sets of data can lead to significant misinterpretation of data or pollution of data sets, making the analyst’s and decision maker’s job that much more difficult and imprecise.

Poor communication or presentation skills can doom an analyst in the eyes of a business user. For example, lack of enthusiasm in presenting results can easily be interpreted as a lack of confidence in the recommendation, resulting in
Decision engineering

Decision engineering is an emerging framework that attempts, as described in Wikipedia, to define and unify a series of best practices for organizational decision making. It is based on the belief that, in many organizations, decision making could be improved if a more structured approach were used. Decision engineering seeks to overcome a decision making “complexity ceiling”, which is characterized by a mismatch between the sophistication of organizational decision-making practices and the complexity of situations in which those decisions must be made. Decision engineering represents a practical application of the field of complex systems, which helps organizations to navigate the multi-faceted systems in which they find themselves.

Despite the availability of advanced process, technical and organizational decision-making tools, decision engineering proponents believe that many organizations continue to make poor decisions. Accordingly, decision engineering seeks to unify a number of decision-making best practices, creating a shared discipline and language for decision-making that crosses multiple industries, both public and private organizations, and that is used worldwide.

To accomplish this ambitious goal, decision engineering applies an engineering approach, building on the insight that it is possible to design the decision itself using many principles previously used for designing more tangible objects like bridges and buildings. This insight was previously applied to the engineering of software – another kind of intangible engineered artifact – with significant benefits.

As in previous engineering disciplines, the use of a visual design language representing decisions is emerging as an important element of decision engineering, since it provides an intuitive common language readily understood by all decision participants, improves the ability to reason about complex systems, and can enhance collaboration.

In addition to visual decision design, there are two other aspects of engineering disciplines that aid mass adoption. These are: a) the creation of a shared language of design elements and b) the use of a common methodology or process, as illustrated in Figure 2.

The need for a unified methodology of decision making is driven by a number of factors that organizations face as they make difficult decisions in a complex internal and external environment. Some examples include:

- The outcomes of decisions are becoming more complex, going well beyond next quarter's revenues or other tangible outcomes to multiple goals that must be satisfied together, some of which are intangible.
- The pace, scope, and complexity of change in general are increasing. The continued march of globalization, the growing numbers of independent actors and advancing technology have increased global connectivity, interdependence and complexity, creating greater uncertainties, systemic risk and a less predictable future. These changes have led to reduced warning times and compressed decision cycles.

Decision engineering seeks to bring to bear a number of established engineering practices to the process of creating a decision. These include requirements analysis, specification, scenario planning, quality assurance, security, and the use of design principles as described above. During the decision execution phase, outputs produced during the design phase can be used in a number of ways; monitoring approaches like business dashboards and assumption-based planning are used to track the outcome of a decision and to trigger re-planning as appropriate.

Like related engineering disciplines before it, decision engineering promises improvements in the quality of decisions made, the ability to make them more quickly, the ability to align organizational resources more effectively around a change in decisions, and lowers the risks associated with decisions. Furthermore, a designed decision can be reused and modified as new information is obtained.

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Figure 2: Decision engineering framework

- The decision lifecycle includes requirement analysis, specification, design, security, quality assurance, alignment, execution and monitoring, and rapid response to change.
- The planning phase involves setting requirements and defining specifications.
- The implementation phase involves design, alignment, execution, and monitoring.
- The outcomes of decisions are becoming more complex, going well beyond next quarter's revenues or other tangible outcomes to multiple goals that must be satisfied together, some of which are intangible.
- The pace, scope, and complexity of change in general are increasing. The continued march of globalization, the growing numbers of independent actors and advancing technology have increased global connectivity, interdependence and complexity, creating greater uncertainties, systemic risk and a less predictable future. These changes have led to reduced warning times and compressed decision cycles.
a lack of perceived credibility for the analyst, and a slower or less effective decision process.

Newcomers to the industry can easily be overwhelmed by the torrent of information available. For example, according to one participant, marketing executives coming to service providers from the consumer product industry are used to relatively simple information – for example, advertising effectiveness relative to product purchase – but not the torrent of customer usage data available. This can be overwhelming to them, delaying decisions or causing them to ignore valuable information.

Data from different sources
Data from different sources (such as financial, usage and customer data) can be very difficult to correlate; this inconsistency can severely impact credibility. Balanced scorecards, while very popular, use a wide variety of key performance indicators, which can be difficult to correlate given different currency and different frequency of measurement.

Results that rarely change can create significant complacency, and sometimes call into question the value of collecting and interpreting the data. For example, if customer satisfaction data does not change much over time, decision makers may question the wisdom of tracking it. Of course, the potential for issues doesn’t go away, and analysts must be at the ready with reasons if something causes a perceptible dip or rise in the numbers.

Among the biggest looming problems are the aging analytical and data models that emphasize voice over data. One service provider said many of its models have not changed in 15 years. Current services are far more complex. For example, the model may contain minutes, but not mobility, quality of service, handset, app, speed, or other relevant data.

Several service providers cited problems just coping with the sheer growth of raw data. As traffic increases rapidly, the amount of network data it generates increases rapidly as well. These participants were seeking ways to cope with this data explosion.

Social media
Finally, the exponential growth in data available from social media, combined with the implicit expectation of rapid response among users, is driving the need for something close to real-time capabilities to be effective in responding to it. Many service providers are looking for ways to be more effective with this type of newer media.

“Service providers cited problems just coping with the sheer growth of raw data. As traffic increases rapidly, the amount of network data it generates increases rapidly as well.”
Service providers and vendors disagree on roles and responsibilities

Section 2

Addressing the problem

Given the scope of the problem and the complexity involved, this is certainly not something that will be solved easily or quickly. Perhaps the biggest issue here is the disagreement between the service providers and the vendors as to roles and responsibilities. Service providers feel that the vendors should understand their needs, be able to create or identify best practices in meeting those needs and offer solutions reflecting those best practices. Vendors respond that it can be very difficult to gain access to service provider personnel to understand the problems in detail, and even the service providers themselves admit that they don’t know what they want and cannot define their problem set “crisply.”

Having said that, no service provider is expecting a complete solution set from the vendors – most of our roundtable participants said they would be happy with a “60 percent solution”, combined with a commitment by the vendor to improve using a continuous improvement approach. Most service providers were looking for help with basic needs, though many would like to begin to better understand real-time analytics and how they could implement them effectively in their organization (though few are confident that they will be able to effect this anytime soon).

Vendors for their part are looking for service providers to step up and prioritize. As pointed out earlier, the service providers themselves admitted that they struggled to clearly identify and prioritize their own needs. All agreed that eventually coming up with a more standardized set of key performance indicators would be useful.

The final point that the vendors made was a reiteration that service providers need a more strategic focus on analytics deployment, and that they must learn to incorporate analytics into their everyday business decision-making process.

“All agreed that eventually coming up with a more standardized set of key performance indicators would be useful.”
Section 3

Conclusions and recommendations

Clearly, all of the service providers participating in the discussion have at least a good sense of the power of analytics tools. While service providers may not be as successful as they would like in their analytics deployments, many have already learned some valuable lessons and have an appreciation for where things can go wrong.

As a result, we have come to some important conclusions. These recognize that no one is starting from scratch; most organizations have spent years, if not decades, building large data stores and analytical tool sets, deriving benefit and learning lessons. None of that is likely to change overnight. Still, the following maxims can be helpful to achieving success:

1. Understand the big picture
We believe that virtually every aspect of a service provider’s operation can be improved by better decision making. As stated earlier in the report, the focus here needs to be first on problem and decision analysis and then on tools. Having said that, analytics can be used to model, measure or predict aspects of customer experience, network and service performance, product and service acceptance, and of course internal processes, increasing efficiency, agility and boosting profitability.

Service providers must develop and manage an enterprise-wide view of where analytics can be most effectively applied to support decisioning in their organizations and where they might gain the greatest return from their deployment. Only then can they give clear prioritization to vendors. This still does not create the clarity in the individual areas that vendors will need to develop effective tools, but at least in aggregate it will point them in the right direction.

2. Pick your places
While all service providers perform similar functions, their related strengths, weaknesses, strategies, priorities and programs may differ significantly. A successful strategy does not require the service provider to be world-class at everything, and in fact service providers probably cannot afford to excel in everything. They must determine which areas are most important for them to succeed and where they can get the best payback from decision improvement and analytics. Once the service provider has determined its focus areas, it should work with its vendors to clearly understand the decision processes and KPIs associated with those areas, and be able to evaluate the vendor’s strategic fit with their direction.

The concept here is that the strategy and the related analytics deployment strategy must be tailored and affordable. Service providers will need to make tough decisions in addressing issues with limited budgets if they cannot prioritize.

3. Mix in some small, fast deployments
Service providers are typically large-scale enterprises, and their processes, systems and projects reflect that; they tend to be large scale
and take significant time to implement. This is true as well of traditional analytics/business intelligence projects. They tend to deal with highly complex problems, require large and diverse data sets (often with questionable quality) and often encounter unforeseen problems.

By choosing a few small but impactful areas where decisioning can be markedly improved and analytics can be quickly deployed with meaningful ROI, service providers can quickly realize benefits and gain some momentum. No one is necessarily expecting 100 percent solutions here, but a 60 percent solution, as mentioned in the roundtable dialog, could go a long way toward success and momentum.

4. Consider a continuous improvement strategy
Given the scope and complexity of the industry, the volatility of the larger digital value chain, the broad scope of analytics-related opportunities and limitations on investment capital, it makes sense to approach decision management and related analytics from a continuous improvement perspective. This was part of the discussion at the roundtable, and in fact a handful of the respondents to our 2010 analytics survey are already pursuing this approach.

5. Manage data as a corporate asset, but recognize that comprehensive data integration is a long-term project
Virtually every aspect of decision management and analytics hinges upon the accuracy and accessibility of data. Unfortunately, this data is found in every nook and cranny of the service provider organization, in every imaginable format, and at times in conflict with the similar data from other sources. Some data is found external to the enterprise, often from third party sources. Data management programs must, therefore, address quality issues and ensure data accessibility and usability, but they must walk before they can run. One approach a few of our respondents discussed was to focus most attention on a handful of critical data elements for initial improvement. This is consistent with the ‘start small’ strategies delineated in recommendation 3. Once those were improved, the group moved incrementally on to another small but critical set of elements.

6. Take advantage of existing frameworks and programs
Given the breadth and complexity of the problem, any help with best practices, data management and domain frameworks will be useful. For example, TM Forum has a number of useful artifacts in this space for service providers and vendors alike – most notably its Information Framework (SID), in addition to the Applications Framework (TAM) and Business Process Framework (eTOM). Finally, the Forum’s Benchmarking program can be used as a source of KPIs, and help drive the deployment of analytical capabilities, especially in targeting process improvement.

“Any organization can benefit from better decision making, and properly positioned, analytics offer great potential to support the process”
Another approach to narrowing the gap between the tool and the business decision maker is to equip the analyst with a better set of skills, making them more effective contributors to business decisions.

Analysts come from a variety of backgrounds; prior to taking their current position they may have been report developers, subject matter experts, data management specialists or perhaps a business process transaction systems analyst who worked with a particular business department. Their strengths may vary considerably. For example, one may be able to source and correlate enormous amounts of data from various sources and select the right subset to answer a particular question, understanding the limitations of the data and where bad data may creep in to distort the results. Others may have strengths in statistical methods, or knowledge of industry or business goals and processes. The real difficulty is finding analysts who can combine these skills with the solid communications skills necessary to interact effectively with business management. Even rarer are the analysts who can provide clear recommendations and communicate them with senior management. Perhaps at the top of the heap are those analysts who do all of these things, plus actually define the right business questions to ask to achieve the desired goal, and then answer them.

The ideal analyst would be adept at listening, writing, modeling, facilitation, negotiation, requirements assessment, analytical methods, business process analysis, data analysis, decision making, ethical analysis, and of course tool use and data quality assessment. They would also understand the subtleties of their business domain, and be able to cultivate relationships and confidence from their business colleagues. Finally, they must be able to bridge the gap between the theoretical and the practical, coming up with actionable and achievable recommendations.

This is a tall order to say the least. It is the rare individual who possesses all of these skills. The skills may exist collectively, however, within a team of analysts. Therefore it is the task of the manager of the analysts to assess and assign the appropriate analyst team members to a particular project or business unit, while continuing to grow the individual analysts’ skill sets in a clear and organized way. Managers should set clear job descriptions and skill set definitions for junior, mid-level and senior analysts, as well as creating clear sets of skills required for particular projects. They should assess their peoples’ strengths and weaknesses, and assign them accordingly to projects or organizations. Finally, they should work with each individual to build a formal and informal training plan that will allow them to grow. This can be addressed by a combination of classes, reading, practicing, auditing, mentoring, and a host of other activities. The important thing is to create a practical plan, cognizant of the organization and the economy, put the plan in place, and make sure it is executed.

There are many resources available to aid in this process. Mentors can be selected and assigned from the senior people in the organization. Organizations such as the International Institute for Business Analysts (IIBA) can help with professional development. The IIBA’s book, Guide to the Business Analysis Body of Knowledge, provides a fairly comprehensive view of the job and skills required. A number of universities offer courses in this space; perhaps the most comprehensive is the Master of Science in Analytics, from the Institute for Advanced Analytics at North Carolina State University. This is not meant to be an exhaustive or complete list of resources, but simply to demonstrate that a broad variety of resources do exist, and should be incorporated into the individual’s education plan.

The bottom line is that while the tools for data management and analytics are continually improving, analysts will continue to occupy a critical role in the decision-making process for the foreseeable future, and success in the decision-making process will often turn on the skills, energy and commitment of the analyst.
7. Involve your vendors early and often
In order to create appropriate solutions, vendors will need some clarity in terms of approaches and priorities from their service provider customers. Relationships will be key here; both service providers and vendors struggling in this regard should do a fresh assessment of themselves and their expectations, engagement styles and strategies. Service providers should also include evaluations of cultural fit, experience and methodology into their vendor selection criteria.

8. Invest in your people
Good analysts are hard to come by. Analysts must acquire and master a broad variety of skills, including quantitative/technical skills, business knowledge and process design skills, relationship building and consulting skills, and coaching skills to help others. Analysts are also highly motivated by challenging and interesting work, allowing them to hone their skills and gain a sense of personal progress. It is important for employers to recognize these requirements and traits, and to create appropriate growth opportunities for analysts, if they want to keep them as employees.

We believe that these are the key recommendations for service providers looking to improve their use of analytics. This will not be a simple process or easy road, but certainly any organization can benefit from better decision making, and properly positioned, analytics offer great potential to support the process.

TM Forum’s data analytics activities and how to join them
The customer experience theme is intertwined in many of the chartered projects in the Revenue Management Initiative, among them data analytics. For more information about these Online Community Groups and to join in, see [http://www.tmforum.org/community/groups/](http://www.tmforum.org/community/groups/)
You can reach Steve Cotton, Head of Revenue Management, TM Forum, via [scotton@tmforum.org](mailto:scotton@tmforum.org)

Customer experience is also being developed through TM Forum Catalyst projects. The next two Catalyst demonstrations will be at [Management World Americas 2011](http://www.tmforum.org/ManagementWorldAmericas/Catalysts/11163/Home.html) (see [http://www.tmforum.org/ManagementWorldAmericas/Catalysts/11163/Home.html](http://www.tmforum.org/ManagementWorldAmericas/Catalysts/11163/Home.html) for more details). They will show how various strands of the Forum’s customer experience activities can combine and will include:

- Business Performance Metric System and its companion Automation program; and
- an Executive Dashboard that draws on our Business Benchmarking and Data Analytics

Analytics have great potential to support the decision-making process
Communications Service Providers (CSPs) are facing new challenges every day. Dealing with new complexities and heightened competition is making it more and more difficult for them to survive, let alone be profitable. In today’s business climate, it is quickly becoming more important to keep an existing customer happy than to focus on acquiring new customers – which not only requires more expenditure, but also more effort. This in turn puts a much heavier focus on “knowing” the customers; operators need to be able to analyze customer behavior and use the intelligence gained to improve subsequent business decisions.

The fundamental issue that acts as a barrier to better and improved decision making is understanding and leveraging the enormous amounts of data generated daily from a variety of sources. Service providers’ OSS/BSS environments contain thousands of systems – from spreadsheets to large legacy mainframe systems to third-party systems. These systems churn out a deluge of data, which can give very useful insights into customer behavior. In addition to that, it can also give valuable information on whether processes and systems are working as intended.

All this data provides CSPs with an opportunity to dive deep into understanding customer behavior, and then tailoring products and services to meet customer needs, in a way that could not have been imagined before. To be able to quickly react to these opportunities and challenges, service providers need to be armed with the right tools to obtain favorable outcomes. One of the key tools in this endeavor is Actionable Intelligence, which leverages analytics to transform data into insights and then to foresight. The diagram on the following page shows how the difficulty keeps increasing as higher levels of analytics and Actionable Intelligence are generated.

Most analytics tools only have the capability to do Descriptive Analytics, and a few have the capability to provide Business Intelligence. Predictive analysis has enormous amounts of complexities involved in the process, but when successfully done, can be a goldmine of intelligence for CSPs.

So how do service providers align themselves in order to achieve Actionable Intelligence? The answer is a 7-step process, as shown below:

1. Collection
2. Normalization
3. Understanding
4. Business Alignment
5. Cause and Effect
6. Prediction
7. Optimization

**1. Collection – Getting good data**

The first step in attaining Actionable Intelligence is, of course, collecting the data that will form the foundation. This data needs to be collected from different silos from across (and sometimes outside) the enterprise, and

They want to make decisions quickly, but also to visualize the effect of their decisions before they make them. Data-driven decisions also have a much higher probability of success than decisions based on hunches.

**The ‘Art’ and ‘Science’ of Actionable Intelligence**

As mentioned earlier, Actionable Intelligence obtained from analytics is the main driving force behind business decisions today which yield favorable results. But what really goes into obtaining Actionable Intelligence is a complex process, which requires proper knowledge and application of analytics techniques. The complexity increases as we transform data into insight and then to foresight. The diagram on the following page shows how the difficulty keeps increasing as higher levels of analytics and Actionable Intelligence are generated.

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7. Optimization

**1. Collection – Getting good data**

The first step in attaining Actionable Intelligence is, of course, collecting the data that will form the foundation. This data needs to be collected from different silos from across (and sometimes outside) the enterprise, and
made available in one place. This step has often proved to be service providers’ Achilles Heel in the quest for Actionable Intelligence.

In order to properly leverage operational data as a foundation for Actionable Intelligence, the data needs to be (a) trusted, (b) available at the right time (including recurrently) and (c) granular.

2. Normalization
Normalization involves creating a common ‘data currency’ using all the different data sets from across the organization. This is imperative in order to facilitate correlation across the different data sets. Once this is accomplished, all the different data sets may be correlated and be better understood. This data can now give users a 360° view of customers, products, etc.

3. Understanding the Data
Once the data has been collected from various business silos and normalized, it should be in a state in which business users can begin to understand and make sense of it. This step involves deep diving into the data to understand what really happened, and why it happened. This is the stage at which the data is beginning to become ‘information’. While this step enables users to find and fix problems soon after they occur, it is still reactive in nature, and often human-intensive.

4. Align the Business
This step involves defining metrics and KPIs on the information from steps 1 through 3 above. Thresholds and alerts can be utilized to highlight issues, and it is at this stage that the information starts becoming actionable. In addition to making the information actionable, this might also involve the use of case management/workflow capabilities to drive action on the uncovered issues. Successful completion of this stage makes the business truly proactive.

5. Cause and Effect
With this step, users start to understand the processes / trends behind observed symptoms. It introduces more predictability into the process, and can involve (a) Building process models and balanced scorecards, (b) Tracking actions and their effects through classification, and (c) Using time series analysis algorithms.
The above steps lead to a good understanding of the processes/trends causing observed symptoms, grounded on real data. This marks the beginning of the end of ‘seat of the pants’ management.

6. Prediction
Once we understand the underlying processes, we can use them to predict in an automated manner – e.g. to predict what customers will do before they do it. This enables the prevention of issues, rather than just diagnosis and fixing, thus making service providers proactive.

7. Optimization
The Actionable Intelligence attained through the above steps can be used not just for metrics-driven management, but also to drive business optimization. This involves streamlining and refining of existing processes based on inefficiencies observed through historical analysis.

Some Real Life Examples
Many CSPs around the world are actually using Actionable Intelligence to reduce costs and improve their customer experience. Shown below are some real world examples of how Actionable Intelligence is making a difference to CSPs globally.

<table>
<thead>
<tr>
<th>Type</th>
<th>Problem Faced</th>
<th>Solution Methodology</th>
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| Propensity to Call: Tier-I Service Provider | High volume of expensive inbound calls to their call center. Using an average cost per contact of $10.00, the call center cost burden for a single product exceeded $20 million annually | - Employ propensity methods to determine which customers were likely to call the call center with billing related issues.  
- Use customer and service data, and combine it with customer behavior and contact history, to generate propensity models that predict when customers will exhibit behavior that might signal a problem.  
- Employ propensity models to also determine how likely a customer is to call the call center within a particular time frame. Using this actionable intelligence, the service provider can then work to operationalize the information into the business. |
| Customer Experience Management: Tier-I Carrier | Need to predict customer satisfaction within their commercial business customer base and, more specifically, when a customer is likely to be dissatisfied with the service provider | - Use a series of data sets that reflect current activities and recent customer polling information; generate a propensity model to predict those businesses that are at risk for being dissatisfied, isolate those customers, and place them into a treatment path within the service provider’s customer care organization.  
- This proactive set of activities will enable the provider to better retain high-value, high-margin accounts while also increasing overall satisfaction ratings. |
| Product Performance Management: Leading Integrated Telecom Service Provider | Need to monitor the performance of new products, services or tariffs and determine the success or failure of a product scheme/launch | - Business Case Validation through monitoring of actual activity and real margins to measure the success of a product. Match interconnect and retail records to obtain margin and actual ARPU and thus determine the success of a service.  
- Identify unprofitable customers through analysis of usage patterns of individual subscriber, groups of subscribers and other segments of the subscriber base.  
- Ability to perform true what-if scenarios which enable the launch of correct products, or an accurate view of how to combat competitor offers. |
Customer experience in a connected world

This report goes back to basics and asks, what are the fundamentals of customer experience in the communications industry today?

Inside you’ll find all the relevant issues and priorities developing in organizations striving to become more customer-focused and profitable, including how customer experience needs to evolve to support emerging businesses like mobile broadband, Machine to Machine and home networking.

We analyze the results of 20 interviews with executives in leading service provider organizations across the world and send you on your way with our 13 key recommendations for approaching customer experience initiatives.

Africa Insights: Sustainable margins through innovation

Operational and business agility is the name of the game for African service providers. TM Forum’s first regional report explores the commercial and business strategies that enable the African continent to deliver new services quickly, reliably and cheaply.

African operators exist in an environment where high churn rates, low average revenue per user and lack of customer loyalty are the norm. Add to this strong competition between operators and you start to understand why only the truly innovative can survive.

This report asks what the rest of the world can learn from the massively varied African communications market and the many innovations going on across this continent.

Approaching cloud services: Markets, positioning and execution

There are many ways to approach cloud services from a strategic, marketing and delivery perspective. Service providers must understand the opportunities and the landscape, making careful choices as to how they go forward. This report hears industry thought leaders present their views on the current market and offer advice on how to be successful. It includes insight into:

- The market for cloud services
- Service providers’ strengths, weaknesses, opportunities and threats
- Pitfalls of cloud services
- Recommendations of how and with whom service providers might approach cloud services.

Visit www.tmforum.org to find out more
The game is changing for communications service providers. Cutting costs is merely a ticket to play, not to grow. The key to growth lies with innovation – underpinned by business agility, smart partnerships and inspired creativity.

As the global industry association focused on simplifying the complexity of running a service provider’s business, TM Forum brings together a community of more than 50,000 professionals on the cutting edge of innovation. As a unifying force for the industry, it’s time for you to join more than 750 companies across 195 countries collaborating to simplify service innovation.

Visit www.tmforum.org to learn more about TM Forum membership and how we help you enable innovation.