Driving operational excellence with predictive analytics
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Introduction
Imagine a smarter planet where companies can profitably streamline their operational processes to meet ever-changing customer demands. Imagine not only optimizing your production and distribution channels, but also ensuring you hire and retain the right employees, who create the right product or service and deliver it at the right time. Imagine the impact of your processes being able to withstand short-term stresses or unexpected changes in the marketplace, rather than being rigid and based on long-term planning. Imagine your operational processes being a major source of your organization’s competitive advantage.

• 74 percent of best-in-class corporations, rated by Aberdeen Group, stated that their top strategic action was to “improve the efficiency of manufacturing operations.”

• Toyota Motor Corp. paid approximately $4.2 billion in warranty claims in 2010.

• Warranty-related expenses can amount to anywhere from .5 percent to 7 percent of product revenue for large companies.

• Sales margins at retailers can diminish anywhere from 5-15 percent with poor assortment planning processes.

• For every dollar collected as premium, insurers spend 13 cents on claims expenses and 61 cents as claims payouts.

• The cost of claims payouts and expenses is the largest spending category for a property and casualty insurer, often times accounting for up to 80 percent of premium revenues.

• Employee turnover costs organizations anywhere between 25 percent and 250 percent of the exiting employee’s annual salary. Entry-level, unskilled positions are at the lower end of the cost range, while executive, managerial and sales positions are at the higher end.
Due to relatively affordable advances in technology, from radio frequency identifiers to sensors to social media, we can now collect, store and analyze information like never before. We are more interconnected, instrumented and intelligent than in any other time in human history, and this smarter planet provides companies with new operational opportunities.

Organizations will only gain from those opportunities if they are able to manage the increasing complexity that surrounds us. Not only are new opportunities emerging in rapidly developing markets, new customer segments are differentiating themselves in mature markets. Adding to the pressure is rapid fragmentation. The world may be flat, but it is now made up of discrete markets, proliferating product and service categories and individualized customer segments. Organizations unprepared to act immediately on these new opportunities may watch them slip away almost as quickly as they emerge.

While rising complexity may sound threatening at first, reframing that initial reaction is fundamentally important. Successful CEOs refashion their organizations, making them faster, more flexible and capable of using complexity to their advantage.

So how does an organization balance a rapidly changing marketplace against its internal capabilities?

“When things look very simple, you need to look for a competitive edge. When things are complex, you simplify to get the competitive advantage.”

Graeme Liebelt, Managing Director and CEO, Orica Limited

The days of working smarter have arrived, and the key lies in operational dexterity or agility, which is crucial to ensuring operational excellence. Your organization must respond more quickly by making changes faster—and keep the operational processes of your company flexible, yet ensure they remain efficient and profitable. An operationally excellent company ensures that all of the internal people, assets and processes are aligned and optimized to deliver the exact product or service that meets customers’ needs. An agile corporation also modifies their operations proactively to ensure that potential operational issues are prevented and future customer needs are met.

The goal of operational dexterity is to not only to meet your customers’ needs, but also utilize it as a competitive advantage. But where do you start?
In this paper we will focus on how to enhance operational agility through predictive analytics technology, and provide you with the steps for doing so. We will also provide examples of how leading organizations are applying IBM SPSS predictive analytics solutions to:

- Manage their physical and virtual assets.
- Maintain their infrastructure and capital equipment.
- Maximize the efficiency of their people, processes and assets.

Some specific solutions include claims management in insurance, demand forecasting in energy and utilities, product optimization in automotive and quality improvement in consulting—though there are many more. As a result of using IBM SPSS Solutions for Predictive Operational Analytics, companies can increase efficiency and productivity, reduce costs, increase profitability, enhance customer satisfaction and become more competitive.

**The need for smarter operations**

Based on an IBM survey of over 400 supply chain executives in over 25 countries and 29 industries, the five major challenges that they face are in cost containment, risk, globalization, customer intimacy and visibility. The biggest challenge, stated by more than 70 percent of executives, was visibility. They don’t have the appropriate level of insight into what is happening within their operations on the ground-level or on the production floor in real time, and this lack of insight hampers their ability to make the right decisions at the right time.

To increase that visibility, operations must be smarter and effectively leverage all available information to make the right decision at the point of impact. The need to be smarter about operations is even more evident in today’s times. Based on a McKinsey Global Survey, almost 75 percent of executives surveyed stated that they first turn to operations to begin cutting business costs. So operations departments are struggling to do more with less—and that isn’t likely to be changing soon.

Instead, organizations must become smarter in their operations to retain customers. Numerous companies are turning to predictive analytics to evaluate their internal workings and adapt operations. Predictive analytics enables companies to strike the right balance between operational cost, speed, flexibility and quality. According to the global supply chain study noted earlier, 48 percent of product companies identify improving quality as a key challenge. For most, balancing the operational levers is a juggling act: the cost for your product or service needs to be as low as possible, yet quality must be high and you need to bring the product or service to market quickly. And, of course, your operations must be flexible enough to modify the product or service if needed. In order for decision makers to ensure that your company is meeting customers’ ever-changing wants and needs, this balance must be optimized in real-time by using all available information. That means not only understanding what has happened in the past, but being able to look forward and anticipate what may occur in the future, so you can modify your operations accordingly.

Predictive analytics can significantly maximize efficiency, productivity and profits. It provides you with access to fact-driven predictive insights in real-time, driven by your organizations’ specific needs.
The Operational Value Cycle

Today’s dynamic environment requires a systematic approach to managing your operations. By using predictive analytics throughout your decision-making lifecycle, you can continuously refine the decisions you make and the strategies that you use as an organization to make decisions that are based on insight.

Being smarter means moving away from a broad long-term planning approach and instead becoming more agile in your ability to respond to each customer—this is operational excellence. Agility allows an organization to become operationally excellent by focusing on the intricacies that a business faces on a daily basis.

In Figure 1, you can see the lifecycle of interactions which a product or service has with its organization. The progression is natural. For example, if your company is product-focused, you plan to create a product and purchase raw materials. Those raw materials are then mixed with other materials or assembled with other parts to create a product. The product is then delivered to your customers. Finally, support is provided to customers for purchasing and using the product. If, for example, you are a consulting firm, the “product” would be an employee, who is hired, trained and finally sent out to the field to deliver additional support.

As the product or service moves through the cycle, its value increases at each point. However, a loss of value may also occur at any point, whether a product is scrapped due to quality concerns, returned from the field, or modified and replaced within existing inventory. Money is likely lost, or additional funds are required to reintroduce that specific part or service back into the value cycle. In order for an organization to profit, its operations team must understand how to mitigate these losses whenever possible.
Operational excellence: efficiency is everyone’s business

Operational excellence means that each product or service throughout each stage of this value cycle not only increases its value, but increases it in an optimal way for the organization. The business processes and interaction points are flexible enough to take into account the unique influences of customer behavior. Operations must ensure that your employees and processes are efficient enough to be modified in real-time to maximize not only output, but also profit.

Below you can see the relationship between the product and various business functions within an organization.

Predictive analytics fits in every aspect of the operational value lifecycle. As you can see, the cycle is continuous: as you acquire new data or feedback from the customer, you analyze it, and learn from it. The insights you gain then help you improve your policies and parameters regarding planning, development, distribution and support—enabling your organization to constantly improve its operations.

Better understand and control your operations with predictive analytics

Predictive analytics allows organizations to squeeze costs out of their operations and ensure that their operations are streamlined and efficient.

With IBM SPSS Solutions for Predictive Operational Analytics, your company is able to better:

- Manage your physical and virtual assets—from identifying the right physical inventory to stock in your multi-tier supply chain to assessing how many components to purchase to support your production facilities.
- Maintain your physical infrastructure and capital equipment—set optimal maintenance schedules to reduce downtime and receive alerts about any imminent failures.
- Maximize your capital—ensure you are allocating your people and cash in the most efficient manner, in the context of your business processes.

Figure 2: Operational excellence is an organizational effort.
Mastering predictive analytics is a journey that starts with using the information that you have to find insights, and continues through determining the next best action for a particular situation or decision maker. Predictive analytics allows organizations to analyze their historical and current data to determine likely future outcomes. Having the answers ahead of time gives you the ability to control what action you take and when, so that you can plan and implement. Without analytics, you react only when an issue has been identified and usually has caused a problem. This can cost your organization, in terms of lost revenue, lost market share, reduced credibility with your employees or customers and even bankruptcy.

A proactive approach to operational excellence begins with analyses of all information that organizations gather. When using IBM SPSS predictive analytics solutions that information could be in structured formats, such as inventory information, production line information and financial information as well as unstructured formats, such as maintenance and production logs, social media content and employee surveys.

Predictive analytics integrates data from various sources and utilizes sophisticated data mining techniques to determine patterns from the data. Business rules, specific to your own organization, can also be included to optimize the outcomes from the predictive models. The outcomes are given probability likelihoods. Decisions can be assigned to the outcomes and deployed to the organization via email, dashboards, scorecards or reports. Once a decision is made, there is a response to the decision, and that acts as another data point. As the data gets updated, the predictive models are refined, providing improved processes, outcomes and decisions.

IBM SPSS Solutions for Predictive Operational Analytics can improve operations in almost any industry segment, from manufacturing to banking, retail to health care. They also work equally well for small to mid-sized companies or a global enterprise.

Let's look at some of the areas in which predictive operational analytics have been particularly effective.

**Efficient and accurate claims processing**

Infinity Property & Casualty Insurance wanted to improve and automate its process for identifying fraudulent claims, both to make better use of its investigative staff and also to pay legitimate claims more quickly. The company also wanted to overhaul its outsourced subrogation process, which was costly, very high-touch, overly reliant on human judgment and produced low restitution rates.

Infinity Property & Casualty implemented IBM SPSS predictive analytics solutions, immediately realizing significant benefit in terms of a reduction in claims payments and improved customer service. “I was looking for a product for the enterprise, one that we could use for a variety of predictive analytics. Primarily, I was interested in speeding the settlement of claims that did not contain elements of fraud. The IBM SPSS solution was the clear winner in meeting all of our requirements,” said Bill Dibble, SVP Claims Operations.

Automated data analysis and workflow identify claims most likely to be fraudulent and expedite the settlement of legitimate claims, improving customer satisfaction and loyalty while reducing third-party collection fees.
Since using the IBM SPSS solution, the company received a 400 percent return on investment (ROI) from the implementation of the claims management process and an increase of $12 million in subrogation recoveries. Infinity has also boosted its accuracy in identifying fraudulent claims from 50 percent to 88 percent, adding $1 million to its bottom line by eliminating about $70,000 per month in third-party collection fees. The referral time to send those claims to Infinity's Special Investigative Unit has gone from 45–60 days down to one to three days.

**Demand forecasting and planning**

IBM SPSS predictive analytics solutions help energy and utilities companies optimize their operations across a wide range of functional areas, providing significant benefits for revenue loss management, load management, outage management, asset management, risk management and energy management.

Through the advanced capabilities of predictive analytics, these organizations can predict future energy demand, optimize rates and pricing programs, better plan for power purchases, foresee the availability of excess energy and gauge the likelihood and location of power outages. In addition to these operational benefits, predictive analytics also provides actionable insights into the changing demands, preferences and behaviors of energy consumers.

For example, CIPCO, Iowa's largest cooperative energy provider, needed to move beyond the limitations of its Microsoft® Excel-based solution to analyze a wide variety of issues. By implementing IBM SPSS technology, CIPCO is now able to continuously monitor and perform analyses on the state of its energy grid in order to optimize prices, extend staffing resources and make better informed investment decisions.

The IBM SPSS technology has improved CIPCO's profitability, enabled better power purchasing decisions and provided an easy-to-understand view of dynamic pricing data to drive greater business success. According to Lisa Sell, CIPCO's energy planning manager, “If we had stayed with Excel, we would be paralyzed by the mass of data. The IBM SPSS solution gives us the power and flexibility to keep track of everything, with very little manual manipulation.”

“With predictive analytics we were basically able to close a hole in our pocket where money was leaking out steadily.”

Bill Dibble, SVP Claims Operations, Infinity Property & Casualty Insurance
Improving the quality of products and services
As a premium manufacturer, The BMW Group aims to win customers over with innovative, original designs and quality, so it’s essential for the company to continually evaluate and assess its products and services and take customers’ opinions on board. The company’s previous product design and quality processes for collecting data was fragmented, so decision makers couldn’t get an integrated view of the data.

Since using IBM SPSS predictive analytics software, The BMW Group has been better able to efficiently manage and analyze vast quantities of data, including data on vehicles and repairs, vehicle error, dealer feedback and more. Doing so enables the company to identify the relationships between product and process data, and their effects on quality. What sets this solution apart is the fact that data is no longer considered in isolation, but in combination, providing completely new insights.

The results of the analyses are immediately channeled back into BMW’s working processes and to a wide circle of users, helping to reduce error rates and save costs—in real time. “In general, it’s about making various processes transparent. Success can then be measured wherever data is generated. The longer term goal is, of course, to improve BMW’s performance in all areas and thus further consolidate its success,” explains Michael Unger, Key Account Manager of Predictive Analytics at IBM SPSS in Germany.

As a result of continually improving its products and services, BMW boosts customer satisfaction and consolidates its position as one of the most successful players in its market.

Reviewing and processing electronic documents
Law firms and their clients needed to find a more efficient way to review the massive volume of electronic documents produced during the discovery phase of a law suit, thus reducing the overall cost of litigation.

CAAS LLC, a company based in New York and Washington D.C. that provides technology solutions and consulting services to law firms, law enforcement agencies and other clients, recognized this challenge. CAAS combined IBM SPSS predictive and text analytics with domain expertise and industry best practices to create a solution that helps lawyers review millions of documents in minutes, identify duplicates, and dramatically reduce the cost of e-discovery.

Rather than sifting through thousands of documents in no particular order, law firms employ sophisticated text analytics tools to rapidly sort the document pile into groups of nearly identical documents, helping attorneys complete the review process in a fraction of the time and at significantly less cost.

As a result, average e-discovery costs were reduced by 30 to 70 percent. “With IBM SPSS predictive analytics, we’re really cutting a lot of cost, increasing accuracy and reducing the time it takes to do a review. It’s a home-run application,” said Gerard J. Britton, Director of Investigative and Compliance Services at CAAS LLC.
Driving operational excellence with predictive analytics

Additional applications
As seen in Figure 3, there are numerous predictive solutions to help you with your operational needs, regardless of your functional area.

**Employee performance**
As the population ages, many companies may find certain employee skills are diminishing. Employers can use IBM SPSS predictive analytics solutions to analyze the personnel data you already collect and identify high-value employees who may be at risk of leaving.
By analyzing both structured and text data such as work records, survey data, demographics and other information, employers can develop a predictive attrition model that identifies those workers most at risk of leaving. What's more, IBM SPSS predictive analytics solutions also help employers determine specific actions they can take to help persuade the employee to remain with the company.

**Predictive maintenance**
Many automotive manufacturers currently face high costs associated with downtime for unscheduled machine maintenance, which can lead to unfilled orders and lost profitability. By using IBM SPSS Solutions for Predictive Operational Analytics to examine all repair, usage and downtime data, your company can predict with a high degree of accuracy which machines are most likely to fail or need service. Armed with this analysis, you can schedule maintenance or repairs before they become a downtime incident—saving money while maintaining a steady production output level.

**Assortment planning**
To maximize the chance that consumers will find the product that they want just when they need it, retailers need to analyze millions of data points and share consolidated information across their supply chains. One major auto parts retailer used IBM SPSS predictive analytics software to combine the best planning rules of its category managers with the forecasting accuracy only statistical modeling can provide. Now the retailer creates sales forecasts for every one of its products and can optimize the product mix at all of its stores. The product placement accuracy rate increased from 40 to 70 percent thanks to greater accuracy across its supply chain, while inventory carrying costs declined significantly.

**Customer research**
Not-for-profit organization FDB needed a way to parse and categorize huge volumes of unstructured data from its ongoing survey of Danish food consumption patterns, which already includes information on 300,000 meals from a representative sample of the population. By using IBM SPSS predictive and text analytics, the organization was able to rapidly categorize and analyze online survey responses from 52,000 consumers per year, without having to read text responses word for word. The survey responses connect consumption behavior with data on purchasing habits, creating new knowledge and commercial opportunities.
Take the next best action

As noted in the examples above, companies of all types are coming to rely on predictive analytics as an effective technology. While usage and adoption may vary from the enterprise level to the departmental level, those moving toward a consistent, controlled approach to managing operations are experiencing significant ROI and benefits.

Organizations typically take one of two approaches to the adoption and use of predictive analytics. Providing insight for decision makers is the top priority for many businesses, and in such cases advanced analytic techniques help to paint a clear picture of what is happening and why. Other companies want to move beyond insight to actually identify the next best action in a critical process—such as determining whether an employee needs an incentive to stay, whether an insurance claim should be sent to the special investigations unit or what to price energy at a certain time.

Our experience shows that organizations grow in analytics maturity step by step. Many have some type of reporting or analytical technologies in place but then find that these technologies don’t adequately address critical business challenges. This realization moves the organization to take steps toward becoming more analytically mature through the use of predictive analytics, which enhances decision-making abilities. Organizations that make this leap are able to differentiate themselves by improving processes and proactively managing their understanding of and responses to operational challenges. We can describe these organizations as “masters”—that is, they are using predictive analytics in sophisticated, innovative ways to protect themselves from major errors and using the data they have to their best advantage in their decision making.

The most advanced organizations, such as Infinity Property & Casualty Corporation and CIPCO, practice information-based decision making to help them achieve operational excellence across the company. Decisions are made in real time based on the data that is available: what is the next best action, based on the information I have? How should I allocate my resources? And how can I automate the decision-making process so that it takes place at the point of interaction?

Organizations at this level are using their knowledge of what has happened in the past to predict what is likely to occur in the future, and applying that insight to build strategies which enable them to optimize their processes and respond appropriately in real time.

Adoption of predictive analytics for operational analytics can also help your organization succeed with other critical strategies that are often related, such as customer intimacy and threat and risk management. For example, when Infinity Property & Casualty deployed predictive analytics to boost the accuracy of claims processing, it also experienced significant increases in customer satisfaction. Because the entire claims process was more efficient, legitimate claims submitted by low-risk policy holders could be processed and settled quickly, while suspect claims were flagged for special handling and given the time and attention required to determine whether or not fraud was a factor.

Although you may be at a different stage of adoption, achieving operational excellence is a realistic target if you approach it with a solid understanding of how you are currently using data to manage operations, and the steps needed to get to your ideal level.
Four steps to creating operational excellence

Ultimately, for organizations to manage operations in today’s intelligent, instrumented and interconnected world, they need to look at how to apply predictive analytics at the point of interaction, where real-time, pattern-based strategies merge with situational context. This level of transformation requires a series of changes in how an enterprise manages information and how it applies that information to achieve its goals.

IBM can work with you to create a road map that includes a series of incremental steps designed to move you towards your operational goals. We recommend that before you make any decisions concerning specific technologies or solutions, you should be able to answer some critical questions about your organization’s current strategy and use of enterprise data:

1. **Determine your organization’s current operations strategy.**
   Identify your approach to operations, both as an enterprise and in key areas such as finance, production or customer service, and the types of actions you are currently taking to reduce operational risks within your processes. Would you describe yourself as reactive, proactive or somewhere in between, depending on the situation or opportunity? How advanced would you like to be in your use of predictive analytics? How are you using analytics to define the parameters of your policies? Is this process dynamic, enabling you to modify policies as conditions change?

2. **Examine your data collection methods and determine how those metrics are or could be aligned with departmental or corporate metrics.** Determine how data is used within the company by different departments. What data are you collecting and how is the data being used today? When is it used? How is it consolidated? How easily can you attain insights from your data? How much of your data is based on textual or unstructured information? Are you analyzing social media data? Are you only leveraging historical data?

3. **Determine your current capabilities versus your needs or wants.**
   Examine how you are using predictive analytics today. Where are you using it, and how? What types of results have you experienced? Are you accurately recognizing challenges and opportunities to your operations, and taking preventive measures to cope efficiently with risks? How are you monitoring the activity that is taking place today? Do you have different levels of decision makers, such as line of business managers and executives? Do they have access to easy-to-understand predictive dashboards?

4. **Identify opportunities for automation and control.** Do you have processes or decisions that can be easily automated, if they aren’t already? How much manual work currently exists, and how many resources are committed to it? Can any decisions be made in real time?

Your responses to these questions will help you begin to identify the areas in which you can start achieving real, incremental results that will benefit your organization.
IBM SPSS solutions: Driving actionable insights

IBM offers you the ability to build upon your existing environment to achieve better business outcomes. We offer a full range of tools, all built on open standards, which you can use as needed to take the next steps in your journey toward achieving operational excellence using predictive analytics.

IBM SPSS predictive analytics solutions help organizations drive optimal outcomes in three core areas that are essential for business success: operational analytics, customer analytics and analytics for threat and risk. Each area focuses on the organizational realities businesses face when optimizing data to gain operational insights and improve critical business functions.

Through solutions such as IBM® SPSS® Statistics, IBM SPSS Modeler, IBM SPSS Data Collection and IBM SPSS Decision Management, people all across your organization can gain more insight, make better decisions and take more decisive actions when they matter most. These solutions form a comprehensive, unified platform that works smoothly to deliver insight to your decision makers. Key capabilities are tightly integrated, and you can build or add capabilities as you need to. All of these software products use open, industry-standard technologies that allow for information to be transmitted and shared securely and efficiently.

You can also enhance and augment your IBM SPSS predictive analytics solutions with complementary technologies from the IBM Business Analytics software portfolio, such as IBM Cognos® Business Intelligence and financial performance software and IBM Maximo asset management software.

Conclusion

IBM SPSS Solutions for Predictive Operational Analytics are designed to meet you where you are and provide value. They enable you to:

- Manage your physical and virtual assets—from identifying the right physical inventory to stock in your multi-tier supply chain to assessing how many components to purchase to support your production facilities.
- Maintain your physical infrastructure and capital equipment—set optimal maintenance schedules to reduce downtime and receive alerts about any imminent failures.
- Maximize your capital—ensure you are allocating your people and cash in the most efficient manner, in the context of your business processes.

The most forward-thinking organizations are turning to predictive analytics as a proactive approach to improving operational agility because it empowers them to:

- Increase efficiency
- Improve productivity
- Reduce costs
- Increase profitability
- Enhance customer and employee satisfaction
- Become more competitive in the marketplace
Companies like yours approach their use of predictive analytics as something which impacts the entire organization. Our solutions provide value to senior management by giving them visibility into what will happen in their operations via key performance predictors, usually displayed in interactive dashboards, reports and alerts. Our software helps line managers and policy makers define how operations will work through highly accurate forecasts and business focused optimization. Decision makers see what will happen in the operations they manage. Our solutions also help individual contributors take the next best action.

With predictive analytics, your organization can find a way to gain a deeper understanding of your operations and use that understanding to develop proactive resolutions to the challenges you face every day.

**About IBM Business Analytics**
IBM Business Analytics software delivers actionable insights decision-makers need to achieve better business performance. IBM offers a comprehensive, unified portfolio of business intelligence, predictive and advanced analytics, financial performance and strategy management, governance, risk and compliance and analytic applications.

With IBM software, companies can spot trends, patterns and anomalies, compare “what if” scenarios, predict potential threats and opportunities, identify and manage key business risks and plan, budget and forecast resources. With these deep analytic capabilities our customers around the world can better understand, anticipate and shape business outcomes.

**For more information**
For further information or to reach a representative please visit [ibm.com/analytics](http://ibm.com/analytics).

**Request a call**
To request a call or to ask a question, go to [ibm.com/business-analytics/contactus](http://ibm.com/business-analytics/contactus). An IBM representative will respond to your inquiry within two business days.

http://www.warrantyweek.com/archive/ww20110630.html

http://www.warrantyweek.com/archive/ww20060711.html and 
“Eighth Annual Warranty Report: Totals & Averages.” Warranty Week: 


Driving operational excellence in claims management. 


A recent IBM CEO study found that 79 percent of respondents expect complexity to increase in the next five years. Capitalizing on Complexity. 
2010 IBM Global CEO Study.

Capitalizing on Complexity. 2010 IBM Global CEO Study.


Economic Conditions Snapshot. McKinsey Global Survey Results: 
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