Three proven methods to achieve a higher ROI from data mining

Take your business results to the next level

Highlights:

- Incorporate additional types of data in your predictive models

- By using IBM SPSS Modeler, you can expand the number and nature of your data mining projects

- Deploy predictive models more broadly throughout your organization

- Conduct data mining in less time at a lower cost

Introduction

Data mining uncovers patterns in data through a variety of predictive techniques. By engaging in data mining, organizations like yours gain greater insight into external conditions, internal processes, your markets – and your customers. You also gain predictive capabilities that can be used both in strategic planning and in daily interactions.

These insights and predictive capabilities are likely already improving your company's marketing campaign management, up-sell and cross-sell activities, or your customer retention, risk analysis, or fraud detection efforts.

But it's likely you can do even better. By using additional kinds of data, by combining proven data mining methods in additional initiatives, or by using advanced deployment options, your company can gain a greater return on your investment in data mining.

For example, you may be using data mining to reduce customer attrition or "churn." Imagine the difference it would make if you could increase the accuracy of your model by an additional 10 to 20 percent. In some industries, this could mean millions in additional revenues.

And what if you could use the customer understanding you've gained in controlling churn to increase the effectiveness of your marketing campaigns? Or if you could turn an existing customer service center into a profitable sales center without adding staff or disrupting service levels? Any additional revenues, whether they're measured in tens of thousands or tens of millions, would immediately be added to your bottom line.

Summary:

This white paper describes some of the benefits to be gained from advanced data mining, including how your organization can achieve a greater return on investment (ROI). It offers practical guidance for incorporating additional data types and sources, expanding the scope of data mining projects and deploying results more effectively throughout your organization.

Achieving these results is not only possible – it's already happening at many companies of all sizes in a wide variety of industries.

Because you are already engaged in data mining, you know that data mining is not just a technical process but a business process. In other words, data mining must be driven by business goals, guided by business knowledge, integrated with business processes and targeted at business deployment. In this way, your company ensures that data mining will cut through "noise" created by irrelevant data and deliver the insights and predictive capabilities that will help you achieve your goals.

This paper describes some of the benefits to be gained from advanced data mining, and then shows you how your organization could go about achieving a greater return on investment (ROI).

SPSS was one of the pioneers in the field of data analysis; it was first on the scene and continues to be one of the most popular and widely used software applications. As a new member of the IBM organization, SPSS brings its leading-edge analytic tools to a broader number of customers worldwide.

IBM SPSS offerings include industry-leading products for data collection, statistics and data mining, with a unifying platform supporting the secure management and deployment of analytical assets.

Taking data mining to the next level

IBM SPSS data mining tools data mining tools are based on industry standards and designed to integrate with your information systems. This allows for seamless integration and consistent methodology in your data mining. The combined effort of IBM and SPSS brings you the utmost in flexibility in the kinds of data you mine and how you deploy results. Using IBM SPSS tools not only increases the likelihood of success, it also improves your ability to repeat that success.

Your prior experience gives you an advantage in taking data mining to the next level. You already understand the three basic steps described in the IBM SPSS white paper, *Planning Successful Data Mining Projects*.

You know that you need to:

- Identify a strategic goal that will benefit from data mining
- Determine the resources needed to carry out a data mining project and establish a supportive infrastructure
- Define an executable data mining strategy

(If you'd like to review any of these topics, contact your IBM SPSS representative for a copy of *Planning Successful Data Mining Projects*.)

In this paper, you'll learn how your organization can increase the return on your data mining investment in one or more of the following ways:

- By incorporating additional types of data, such as free text, web behavior data, or survey data in your predictive models. This improves model accuracy and makes your models more effective in providing insight or predictions related to particular business challenges.
- By expanding the scope of your organization's data mining – for example, using data mining to address additional business problems or by applying it in different areas of your organization.
- By using advanced deployment options – delivering insight or predictions to a broader number of individuals or to automated systems.

Incorporating additional types of data

It's highly likely that your organization holds information about your customers in a number of different places. And, like many organizations, you may not be making full use of this information. When you combine text, web or survey data with the structured data used to build models, you're enriching the information available for prediction. This makes your models more accurate and the decisions based upon them more effective. And today's data mining technologies make this an achievable goal.

Even if you add only one additional type of data, you'll see an improvement in results. Incorporating other types of data has demonstrated even greater improvement.

To determine if your company might benefit from incorporating additional types of data, begin by asking the following questions:

- What kinds of business problems are we trying to solve?
- What kinds of data do we have that might address these problems?

The answers will determine what kinds of data you include, and why. You will then want to use proven "best practices" in incorporating these kinds of data.

Adding text data

For example, suppose your company wants to improve customer retention. You may have customer comments stored in customer emails or in free-text fields in call center or sales force automation applications. By matching patterns in comments with patterns in customer behavior, you may uncover clues that suggest a high-value customer is likely to stop doing business with you. You can then develop offers or entire marketing campaigns to retain them.

Other efforts that benefit from text mining include more efficient customer acquisition, improving the quality of your products or services and developing successful new offerings faster. You can also use text data to help identify wasteful or potentially fraudulent behavior.

A key success factor in adding textual data is involving business users or subject matter experts – people who know the terminology, acronyms, or jargon that may be found in the text. They can help identify terms that should be added to (or excluded from) analysis. They can also help refine the number of concepts uncovered.

Adding web data

Let's take the same business problem, customer retention, but look at how a company might address it using data on website behavior.

Whether your website supports online purchasing or simply provides information to guide offline interactions, you are likely to have a large amount of data on visitor behavior. Analyzing this data uncovers patterns that may help you keep doing business with desirable customers.

For example, do visitors who conduct a site search leave the site if they don't find what they need? Do customers often send an email to customer service before returning a purchase or closing an account? Do they download coupons for offline services but fail to redeem them?

While this insight is valuable in itself, you gain even greater value by combining data on web behavior with other information you have about your customers. Not only can you identify points at which your company could intervene to retain customers, you also know which customers are most worth retaining.

Readiness checklist:

Incorporating additional types of data

- Business problem identified

- Relevant data sources located

- Appropriate data analysis tools evaluated and selected

- Business and technical staff identified and recruited

In addition to improving customer retention, analyzing web data can help your company increase customer lifetime value, optimize your marketing and advertising spending, minimize losses due to "click fraud," evaluate multi-channel commerce effectiveness, assess affiliate and partner networks, and analyze content effectiveness.

When analyzing web data, business and technical staff will need to collaborate to interpret results and develop action plans. Working together, they can evaluate whether making a change in your site's design, navigation or content is likely to result in the desired improvement, or if changes in your online advertising strategy are needed. You might even be able to influence desired changes in offline behavior by making changes to online interactions.

Adding survey data

Now let's look at the customer retention problem as it might be addressed using survey data.

Let's say that your company is losing a certain percentage of customers, and that you think it might be due to competitors' lower prices. However, by conducting a survey and comparing results to other information you have about your customers, you learn that your most profitable customers are less concerned about price than they are about obtaining the additional features your competitors offer. This analysis provides your company with insight that helps you make more informed decisions about competitive tactics.

Survey research can be used for many purposes. You can identify the demographic or behavioral characteristics of your most valuable customers; this brings greater focus to your customer acquisition strategies. You can uncover prospective customers' attitudes and affinities in order to develop new products or services more rapidly or to up-sell or cross-sell existing ones more efficiently. You can understand more clearly how the public perceives your brand compared to the competition, and spot trends in the market in time to plan and implement appropriate business strategies.

As is the case with text and web data, there are recognized best practices to be followed when incorporating survey data in predictive models.

For instance, it will be much more efficient to incorporate survey data if your survey tool delivers results to a commonly used software application or database and your data mining tool can access such data sources. When combining survey and transactional data in predictive models, it is best to involve staff who are familiar with each type of data, and have them collaborate with the developers of your predictive models. Finally, business experts will want to evaluate how best to apply insights gained through data mining to your organization's strategic and tactical planning.

Expanding the scope of data mining

Since your organization has already invested in data mining, one way you can increase your ROI is by expanding the number of data mining projects you undertake. This is a fairly straightforward but sometimes over-looked way of improving your organization's ROI. You can expand your efforts either by addressing additional related business challenges or by applying data mining in different departments or geographic regions. Companies both large and small are already benefiting from doing this. For example, a spare parts supplier based in the U.K. that uses data mining to reduce inventory costs went on to apply similar predictive models to its operations elsewhere in Europe.

If your company has already made progress on your top-priority challenges, consider whether there are secondary challenges that you might now address. Or if your organization's priorities have changed, a shift in the focus of your data mining efforts may be appropriate. How might this work, in practice?

Let's say you are a financial organization currently using the clustering capabilities of data mining to optimize marketing campaigns through improved customer segmentation. Additional related business challenges might include:

- Identifying your most creditworthy customers
- Improving your ability to up-sell and cross-sell effectively during customer interactions
- Defining new product or service offerings

Readiness checklist:

Expanding the scope of data mining

- Business priorities re-examined

- Additional applications of data mining identified

- Uses by other departments or regions identified

- Benefits of centralized model management evaluated

Readiness checklist:

Using advanced deployment options

- Customer touchpoints identified

- Business objectives prioritized

- Deployment strategies evaluated

- Deployment strategy selected

Or you may be a telecommunications company using the pattern matching capabilities of data mining to anticipate and minimize customer churn. Additional related applications of data mining might include:

- Identifying market sectors for improved customer acquisition
- Deciding which features to "bundle" for specific promotions

Or you may be a government agency currently using the anomaly detection capabilities of data mining to discover payment errors. Additional related efforts that might benefit from data mining include:

- Isolating potentially fraudulent payments for further investigation
- Uncovering wasted or duplicated efforts
- Detecting network intrusions

In expanding the use of data mining within your organization, be sure to select tools that provide a rich choice of algorithms and algorithm types, so that you have suitable algorithms available for the data and business problems you are addressing.

Extending the benefits of data mining from one area of your organization to another may require some "evangelization" on the part of your data mining champions. But since data mining has such a positive impact on business results, the results you've already achieved can be used to build a business case for adopting data mining in other areas.

Increasing collaboration through model management

As you engage in additional data mining projects or extend data mining to other areas of your organization, you can take advantage of recent enhancements to data mining tools that enable you to centralize the management of data mining models. These enhancements foster greater collaboration and enterprise efficiency. They also help your organization avoid wasted or duplicated effort while ensuring that your most effective predictive models are applied to your business challenges.

To help determine if your company might benefit from centrally managing data mining models, begin by asking the following questions:

- Do our modelers have a way of knowing about work others have already done that relates to their current data mining task?
- Could our staff undertake additional data mining projects if processes were standardized and reusable?

- Do we have a means of sharing information about data mining "best practices" internally?
- Is there a way to be sure that only the correct model is used when updating data – and to document this?

Using advanced deployment options

Deployment is a key factor in obtaining a high ROI in data mining. Organizations that efficiently deliver results to staff – whether they're planning marketing campaigns or cross-selling to customers in a call center – consistently achieve a higher rate of return.

Data mining, like other information technologies, continues to evolve. In early implementations, deployment consisted of providing analysts with models and managers with reports. Reports and models had to be interpreted by managers or staff before strategic or tactical plans could be developed. Later, many companies used batch scoring – often conducted at off-peak hours – to more efficiently incorporate updated predictions in their databases. It even became possible to automate the scheduling of updates and to embed scoring engines within existing applications.

Now, processing efficiencies and other technological advances make it possible to update even massive datasets containing billions of scores in just a few hours. Tactical data mining models can be updated in real time, with results deployed to customer-contact staff as they interact with customers. Alternatively, models can be integrated with systems that generate sales offers automatically, identify creditworthy customers immediately or flag insurance claims as potentially fraudulent – to name just a few examples.

This is called the "decision optimization" phase of predictive analytics. To help determine if your company might benefit from enhanced deployment of data mining models and results, begin by asking the following questions:

- Where are our critical customer touchpoints?
- Are data mining models and results available there?
- If so, are they available in real time?

Other success factors in increasing ROI

Additional factors affect a project's success and increase your overall ROI. These factors enable you to conduct data mining in less time and at lower cost, yet achieve the results you want.

An integrated toolkit

Your company saves time and improves the flow of analysis by selecting a toolkit that supports every step of the process: data access, data manipulation, visualization, modeling algorithms, scoring, and reporting.

An integrated toolkit is even more important when incorporating additional types of data. Your analysts can follow a train of thought efficiently if they use a single interface, regardless of the type of data involved in the analysis. In addition, an integrated toolkit that facilitates deployment to other systems delivers actionable information more rapidly.

An open architecture

Data mining tools that require data to be converted and stored in a proprietary format introduce inefficiencies, delays, and added cost into the data mining process. As you introduce additional types of data, openness becomes even more important, because each type of data is likely to originate in a different system and exist in a variety of formats. If you had to move or reformat each type of data, the analytical process would be slower and more cumbersome.

In addition, it is critical for deployment that a data mining tool can interoperate with other software applications and information systems. This capability transforms predictive modeling from something used only by analysts to something that supports decision-making and customer interactions enterprise-wide.

Conclusion

Every transaction, event, customer contact, survey response and website hit provides information about customers and operations. Databases are full of these useful insights, as are email archives, sales support and call center software and other customer management systems. The goal of both business managers and technical staff is to transform this raw data into useful information that can drive your organization's success. Over the past decade, data mining has proven its value in uncovering hidden patterns and relationships in data – in organizations of all sizes, in virtually every industry.

This paper has described the benefits to be gained by taking data mining to the next level, and described several ways to do this: incorporating additional types of data in your predictive models, expanding the number and nature of your data mining projects and deploying predictive models and insights more broadly throughout your organization.

These approaches are already delivering measurable results for both commercial and public sector organizations. Look at your own organization and think how expanding your data mining efforts might affect the results of your marketing campaigns, your customer retention efforts – or your efforts to separate valid transactions from potentially fraudulent ones. Since you have already made an investment in the people and other resources needed to conduct data mining, you're well prepared to take the next step toward improved results. And IBM SPSS technology is uniquely capable of helping you take that step.

IBM SPSS predictive analytics solutions

IBM is recognized by technology analysts as one of the global leaders in providing predictive analytics solutions that deliver measurable business benefits.

IBM SPSS data mining solutions offer a broad range of techniques designed to meet the needs of virtually every data mining application. These techniques include a selection of algorithms for clustering, classification, association, and prediction. Our solution also features an easy-to-use graphical interface, which enables you to incorporate business knowledge at any point in the data mining process. Its other capabilities increase the speed and efficiency of your data mining and make the most of your existing technology infrastructure.

You can improve the accuracy of your models by incorporating free-text data, behavioral data from web logs, and demographic and attitudinal data from surveys.

You can further increase the effectiveness of your data mining efforts by centralizing the storage and management of predictive models, with assistance from a complementary IBM SPSS solution. We also offer a number of ways for you to deploy data mining results. These options enable you to deliver predictive insights, recommendations, and even entire models to strategic decision-makers, to customer-contact staff, and to operational systems. We offer solutions tailored to specific industries and business challenges. In addition, IBM consulting services can help your organization implement a predictive analytics solution according to industry-standard best practices.

About IBM Business Analytics

IBM Business Analytics software delivers complete, consistent and accurate information that decision-makers trust to improve business performance. A comprehensive portfolio of business intelligence, predictive analytics, financial performance and strategy management, and analytic applications provides clear, immediate and actionable insights into current performance and the ability to predict future outcomes. Combined with rich industry solutions, proven practices and professional services, organizations of every size can drive the highest productivity, confidently automate decisions and deliver better results.

As part of this portfolio, IBM SPSS Predictive Analytics software helps organizations predict future events and proactively act upon that insight to drive better business outcomes. Commercial, government and academic customers worldwide rely on IBM SPSS technology as a competitive advantage in attracting, retaining and growing customers, while reducing fraud and mitigating risk. By incorporating IBM SPSS software into their daily operations, organizations become predictive enterprises – able to direct and automate decisions to meet business goals and achieve measurable competitive advantage. For further information or to reach a representative visit www.ibm.com/spss.

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