

# Predicting and improving process outcomes

*Linking predictive analytics and business process management  
to drive improved performance*



# The need to drive business performance

and increasing competitiveness is leading to many initiatives that aim to satisfy today's informed and demanding customers, while protecting and improving the bottom line. What if we could predict outcomes based on process variables we can collect data on? What if we could improve our business processes so that service is seamless yet costs are contained? There is a tendency to examine these types of questions in isolation from each other. The results of an IBM proof of concept suggest that much more could be gained by considering them together.

IBM has established that by combining predictive analytics and business process management (BPM), a business could improve performance in a variety of different scenarios such as reduced claims leakage, improved customer satisfaction, more efficient processing of distressed loans and reduced operational costs.

This paper explains how we established and validated our point of view and how benefits could be realised across a wide range of scenarios in the insurance industry and the wider financial services sector.

## Predictive analytics

Predictive analytics is the capability to model a statistically significant impact on business outcomes using measured predictor variables from a range of data sources. Such outcomes may be favourable (improved up-sell and cross-sell results, for example) or unfavourable (associated with fraudulent activity, for instance). Critical to this capability are the diversity and quality of the data sources and the definition of the outcome being modelled.

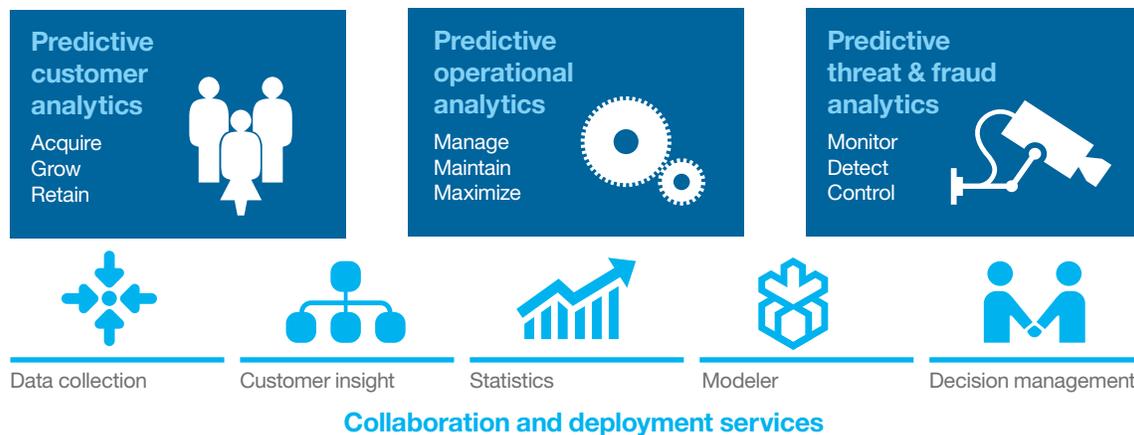


Figure 1: Predictive analytics.

The diversity of data is rapidly expanding with the use of social media. Not only is this a new data source, but the data is uncertain and arrives at speed and in volume. It is also in many cases unstructured, but the ability to structure, analyse and model this data can provide a rich source of information that can be embedded in intelligent processes.

The value of predictive analytics is not realised if its usage simply stops at producing findings that are ‘nice to know.’ Predictive models need to be continually expanded and refreshed to take in new and current data sources, especially where outcomes are subject to continual change and predictor variables are unlikely to be static in their influence.

The secret is to:

- Define outcomes, the changes in which have measurable value; and
- Identify predictor variables whose existence or incidence can be addressed by process change.

When it comes to predictive modelling, people often say, ‘we don’t know what we don’t know’ but that often means, ‘we don’t know what we could know.’ Developing a predictive analytics capability is a journey; it is not embarrassing to start small.

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*“We were able to demonstrate the power of using predictive modelling and business rules to score claims based on a number of known risk factors.”*

*“By building business rules based on numerous risk factors like this one, we were able to develop a reliable model that enabled us to segment claims effectively.”*

*“IBM and Olrac SP Solutions have helped us build a solution that has not only transformed our claims processing methodology in terms of speed and efficiency, but also provides game-changing insight—helping us protect our business and our customers by bringing fraudsters to justice.”*

**Anesh Govender**

Head : Operations Finance, Santam Insurance

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## Business process management

BPM provides a framework within which a set of business services comprising a business process can be quickly defined, run and improved.

In today's market there is a clear need to improve business performance continuously, and BPM solutions can help. IBM's global CFO Study<sup>1</sup> in 2010 identified four types of CFOs: Scorekeepers; Disciplined Operators; Constrained Advisors; and Value Integrators. Each has their own characteristics, but it is the Value Integrators who are more effective in every area assessed in the study, and who drive sustained business outcomes. The study showed that the Value Integrators' organisations had a high focus on workflow automation tools and measurement and monitoring of processes.

A BPM solution is characterised by an agile implementation methodology; flexible software supporting rapid process design and optimisation; integration with targeted operational systems and data sources; business rules definition and execution; and

extensive reporting of process outcomes through key performance indicators (KPIs). Such KPIs could include process elapsed times, process bottlenecks, resource allocation and consumption, and process variability.

## Soul mates

When you consider predictive analytics and BPM capabilities together, some obvious complementary aspects make them natural companions in the end-to-end transformation story. They both:

- Focus on process outcomes;
- Use a broad canvas of data sets and data content;
- Exploit predictor variables through identification and a rules treatment;
- Use KPI definitions to measure and report outcomes;
- Use simulation techniques;
- Look to start small and expand on the basis of proof points; and
- Look for continuous improvement based on empirical data.

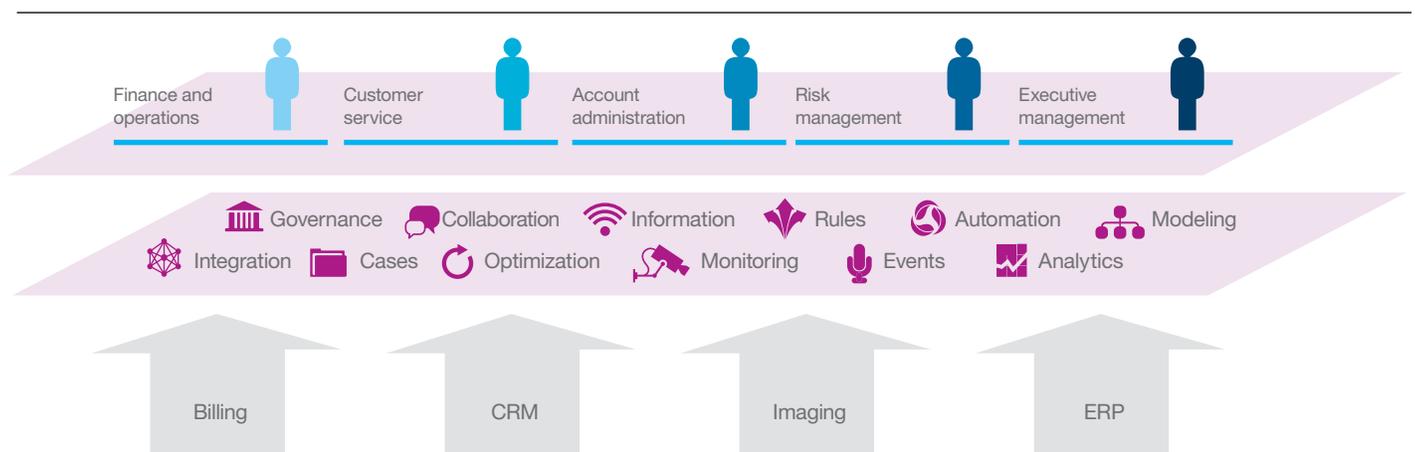


Figure 2: Business process management framework.

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*“There is a fierce competition that comes in terms of pricing and in terms of quality and service levels. To better serve our customers, it is key to our strategy that we are able to commit to them with the best SLAs available in the market. To achieve this, the only way is to be able to control a process: if you have very good information on how the process is flowing and if you can make this process repeatable and benchmark it, then you can improve it consistently every day”*

**Miguel Rio-Tinto**

Group CIO, Espírito Santo Financial Group

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However, there is a significant difference. Predictive analytics initiatives tend to be relatively static in nature. The initiative is often a one-off, maybe with a periodic refresh, but rarely with improved models using extended data sets. On the other hand, BPM is a continuous exercise.

In the world of ever-increasing social and unstructured data, it will no longer be sufficient to rely just on data within corporate systems, or worse still, just from one line of business system. Extended use of BPM solutions in itself will expand the data sets available for predictive analytics, as highly granular process data and its impact on process outcomes, is an inherent output of a BPM solution.

Predictive analytics and BPM have a natural place where technology can identify predictor variables for process

outcomes and hence address consistency of process. This habitat is an environment where processes need to deal with variability, outcomes have a significant financial importance, and resource with appropriate skills is a challenge. Examples include insurance claims processing, insurance policy administration, mortgage processing, distressed loans and customer complaints.

### **Proving the point – claims leakage**

Enough of the theory, what about a practical example?

The focus of many articles on BPM is on its ability to support business improvement initiatives across the enterprise. This can mean addressing operational expenses or an improved customer experience, through both the sales and service processes. What these areas have in common is that they can have a dramatic impact on enterprise value, with more attractive returns on investment often associated with revenue enhancement from improved up-sell and cross-sell, and improved customer satisfaction.

This is not surprising, given the costs of replacing non-renewed business, and it reflects the current priorities of CEOs and CMOs worldwide, where our studies have shown that customer insights and management are top of their agendas<sup>2</sup>.

However, insurance companies are unique in this regard. Given that perhaps 70% of premium is paid out in claims settlements, claims performance improvement is a key leverage point for a BPM solution that drives process improvement.

A concept well known to claims management organisations, claims leakage is the amount of claims cost incurred in excess of the insurer’s contractual liabilities and necessary loss adjustment expenses. It can be measured gross (absolute measure of overpayments) or net (taking into account the probability that the leakage could have been reasonably avoided).

Insurers typically assess the level of leakage through regular reviews of a statistically significant and unbiased sample of recently closed claims. In this process, the amount of leakage and the underlying failures against defined claims practice are recorded.

Leakage reviews provide a rich data set of outcomes (leakage) and potential predictor variables, which may include claims life cycle dates, policyholder, claimant and policy information, claim handler skills, perils, supply chain information, to name just a few, that are well suited to predictive analytics modelling treatment.

Most insurers carry out leakage studies in various guises, but rarely do they progress to a predictive analytics modelling exercise to identify the key drivers of claims leakage, and hence provide a basis to prioritise process improvement initiatives that aim to reduce future leakage.

The other interesting observation we have made through our review of a number of client leakage studies is that leakage causes can be addressed by a range of different solutions and capabilities. Our analysis suggests that the rigorous application of business rules through supporting technology shows the best opportunity to improve claims management. This is likely to become even more so as claims handler skills become increasingly difficult to find, and claimants, through improved access to information and social networks, are better informed in their interactions with the insurer's claims department.

## **The role of predictive analytics in claims leakage**

We have developed a proof-of-concept, using IBM's SPSS Modeler software, to model claims leakage within a simulated claims leakage dataset against a set of leakage predictor variables. For the purpose of this exercise, our hypothesis was that claims leakage was driven by the following predictor variables:

- Claim handler caseload at the time of allocation of the new claim;
- Mismatch between claim complexity and the skill or experience of the handler to which it was allocated;
- Delay between the date of the claim event and the date it was notified to the insurer;
- Period between policy inception and the date of claim; and
- Number of previous claims for that policyholder.

The outcome of this simulated analysis was that there were two statistically significant drivers of claims leakage:

- Claim handler case load at the time of allocation of the new claim; and
- Mismatch between claim complexity and the skill or experience of the handler to which it was allocated.

Using this approach, we created a predictive model that could be used to model overall portfolio leakage and provide a confidence interval in which the predicted leakage could be measured. We could also quantify the impact on leakage of an alternative allocation of claims under a prescribed set of allocation rules, and subject to the constraints of available resources.

## The role of a BPM solution in claims leakage

Using IBM's BlueWorks Live process modelling software, we defined processes whose outcome would have a proven and significant impact on claims leakage – the key decision points being who do I allocate the claim to, both in terms of experience and caseload, or is it one for a 'straight through processing' treatment, or one for the Special Investigation Unit?

This approach required IBM's BPM solution technology to:

- Determine the claim complexity based on the attributes of the claim captured at First Notification of Loss (FNOL);
- Determine the case loads of the available handlers in real time;
- Optimise the claim allocation, recognising the downside of over-allocating to experienced handlers;
- Provide key metrics in real time of the outcomes from execution of the BPM process model; and
- Calculate the projected claims leakage by applying the predictive model to the claims process outcomes determined using the defined predictive model.

Fine-tuning of the work allocation rules within the BPM solution was carried out by assessing the impact of each refinement, in the context of the underlying predictive model, across the whole claims portfolio.

By refining the work allocation rules to reach the optimum distribution of the claims across the available resource, we demonstrated that we could significantly reduce the predicted leakage for the portfolio as a whole.

### A match made in heaven?

While in this particular exercise the focus was on claims leakage, that was simply our example; we could have tested this approach with another process and another outcome. For example, we could have used the same technique to develop a predictive model linking the Net Promoter Score (NPS) to the measurable aspects of the claims experience (NPS reduction is similar to claims leakage in that respect).

We learned some significant lessons:

- The predictive model needs to focus on and identify important and measurable drivers of process outcome, wherever the supporting data is sourced – this almost certainly means it is necessary to use more than just the data in your line of business systems;
- The process outcome you are trying to influence must be measurable and have an impact on value - otherwise, why worry about it?
- Knowing the answer through predictive modelling before you start BPM solution design eases the process - the challenge then becomes one of showing you can successfully address the value drivers, rather than demonstrating the benefits which may, in some cases, not emerge for several months, but are locked in by the statistical robustness of the predictive model;
- Predictive model complexity is constrained by volume and quality of data;
- The BPM solution process must include decision points that are related to the drivers of process outcome;
- In the normal course of events, there should be no constraints on the complexity you may wish to include in the business process and its underlying rules.

## Conclusion

Developing a predictive analytics modelling and BPM solution is a capability-building journey; it is a journey to an enterprise vision, not a one-stop project initiative. As such, an enterprise sponsor needs to understand the philosophy behind this approach, and easily be able to extrapolate to a range of other scenarios. But, seeing is believing, so initiatives need to show tangible results quickly, in order to build knowledge of this enterprise capability and confidence in it.

For more information about the author and IBM's point of view on using predictive analytics and BPM to improve the performance of your business, please contact Graham Jackson at [graham.jackson@uk.ibm.com](mailto:graham.jackson@uk.ibm.com).

## About the author

Graham Jackson is an associate partner in the Insurance practice of IBM Global Business Services in the UK and Ireland, and holds a BSc (Hons) degree in Mathematical Statistics from The University of Adelaide. Graham qualified as an actuary in Australia and spent many years within the insurance industries of Australia, New Zealand and the UK in a range of actuarial and management roles prior to joining IBM. At IBM, he has been at the forefront of a number of client claims transformation engagements, with particular focus on embedding claims performance management frameworks, including claims leakage measurement.

## References

- 1 IBM Institute for Business Value, Global CFO Study 2010
- 2 IBM Institute for Business Value, Global CEO Study 2012 and Global CMO Study 2011.



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