Combating risk with predictive intelligence
An analytical approach to enterprise risk management

July 25, 2012
IBM surveyed 494 companies to better understand how various risk factors are affecting their overall enterprise performance.

**Study Objectives**

- Understand what risk factors are top-of-mind with executives today, and what they are strategizing to alleviate the affects of risk on their enterprise performance.
- Identify their priorities and initiatives that they are investing in to mitigate and manage risk.
- Learn how they are organizationally governing these risk initiatives.

**Study Methodology**

- On-line survey conducted by IBM Institute for Business Value.
- 494 responses from individuals with a title of CxO, EVP, GM, Vice President, Director, Product/Functional Mgr.
- Interviews with companies that have holistic programs and are monetizing risk to mitigate the effects and deliver value to the enterprise.

Combating risk with predictive intelligence.
The study represented a diverse mix of locations, industries and organization sizes.

**Location**
- Asia-Pacific: 19%
- Latin America: 36%
- North America: 39%
- Eastern Europe: 4%
- Western Europe: 2%

**Title**
- Board Member: 27%
- Chief Risk Officer: 22%
- CEO/CIO/COO: 17%
- GM/EVP/SVP: 8%
- Director: 2%
- Manager: 24%

**Company Size**
- < 0.5 Billion USD: 16%
- $0.5B USD - 1B USD: 35%
- 1B USD - 5B USD: 15%
- 5B USD - 10B USD: 15%
- 10B USD+: 19%

70% > 1 B

**Industry Sectors**
- Industrial: 16%
- Distribution: 25%
- Communications: 21%
- Financial Services: 10%
- Technology: 28%

Source: IBM Institute for Business Value Risk Management Study
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Six mega-trends are impacting enterprises around the world

**Globalization Redefined**
- Economic power shifts to Asia
- The development of Growth Markets lead the world’s growth
- Real time business to business decisions and collaboration in an open environment
- Outsourcing will continue to accelerate as businesses seek to optimize operations

**Technological Progress**
- Operational processes in the Cloud
- Mobile/ubiquitous computing decreases reliance on people creating information
- Analytics gives rise to intelligent supply chain systems that make decisions automatically
- Unprecedented interaction/collaboration

**Population Migration**
- Mega cities, mega regions and mega corridors; where most business will occur
- Globalist employees replace less effective approaches
- Technology rules and understanding of intersection between physical and virtual worlds increases

**Informed Customer**
- Managing market and political uncertainty is more complex than ever
- Accelerating global shifts pose new risks; resiliency/responsiveness differentiate
- Evolution to a holistic view of risk management
- Risks can be hedged through intelligence

**Risk Complexity**
- Sustainability is an imperative
- The future sustainable supply chain provides significant and measurable benefits to all
- Consumer demand and government regulations demand an intense focus on sustainability

**Sustainability Imperative**
- Customers thrive on knowledge and wield unprecedented power
- Consumers are busier and are demanding – and receiving – more information before making their decisions
- Consumers have more power to reward or punish and want their consumption to match their values
The significance of Risk has changed over the last decade, leading to an evolution in the scope of Enterprise Risk Management

The evolution to an enterprise and value network view of ‘risk’ has been necessitated by the diversity of sudden geo-political risks, tragic natural events, and daily operational/financial disruptions.

The scope is global and includes managing operational and financial risks, influenced by market risks with the people and technologies that enable predictive mitigation.

Source: IBM Institute for Business Value Risk Management Study
Enterprises are struggling to combat the pressures of our global economic environment and its direct affect on their markets

What are the 3 most important external forces that will impact your organization over the next 3-5 years?

<table>
<thead>
<tr>
<th>Key external factors</th>
<th>What were the others?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market factors</td>
<td>Technology</td>
</tr>
<tr>
<td>29.3%</td>
<td>11.7%</td>
</tr>
<tr>
<td>Macro-economic factors</td>
<td>Talent/skills</td>
</tr>
<tr>
<td>15%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Regulatory concerns</td>
<td>Socio-economic factors</td>
</tr>
<tr>
<td>15%</td>
<td>5.5%</td>
</tr>
<tr>
<td></td>
<td>Globalization</td>
</tr>
<tr>
<td></td>
<td>5.1%</td>
</tr>
<tr>
<td></td>
<td>Environmental issues</td>
</tr>
<tr>
<td></td>
<td>3.8%</td>
</tr>
<tr>
<td></td>
<td>Geopolitical factors</td>
</tr>
<tr>
<td></td>
<td>3.0%</td>
</tr>
</tbody>
</table>

Source: IBM Institute for Business Value Risk Management Study
77% of executives feel that risk exposure has increased. Not a single respondent said risk is decreasing.

Has your company increased/decreased its focus on risk management in the past 12 months?

- **Increased**: 51%
- **Significant Increase**: 26%
- **No Change**: 23%
- **Has Decreased**: 0%
| 1 | Major factors affecting the enterprise today |
| 2 | The state of enterprise risk management     |
| 3 | Applying predictive intelligence            |
The state of enterprise risk management

Overall, companies are embracing the need for a formal risk management function with formalized, communicated plans

<table>
<thead>
<tr>
<th>Does your company have a Chief Risk Officer or equivalent?</th>
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<tbody>
<tr>
<td>34% Yes</td>
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</table>

<table>
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<tr>
<th>Where does the primary risk management function report in the organization?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Executive Officer (CEO)</td>
</tr>
<tr>
<td>Chief Financial Officer (CFO)</td>
</tr>
<tr>
<td>Chief Risk Officer (CRO)</td>
</tr>
<tr>
<td>Board of Directors</td>
</tr>
<tr>
<td>Supply chain/operations executive</td>
</tr>
<tr>
<td>Chief legal counsel</td>
</tr>
<tr>
<td>Risk and compliance department</td>
</tr>
<tr>
<td>No one specifically responsible</td>
</tr>
</tbody>
</table>

Well crafted and communicated risk management plan is in place

53%

Source: IBM Institute for Business Value Risk Management Study
Companies have focused on creating their risk plans — and putting supporting processes and leadership in place

Which of the following initiatives has your organization adopted?

- Create a business continuity plan: 64%
- Invest in new risk-related solutions: 58%
- Establish company-wide risk management team: 49%
- Align and discuss issues with supply-chain partners: 46%
- Assign overall responsibility to a single executive: 45%
- Develop communications or training program: 42%
- Respond to recent natural disasters by rethinking strategies: 41%
- Develop integrated business resilience strategy: 37%
- Engage external advisors: 34%

Source: IBM Institute for Business Value Risk Management Study

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Risk awareness, early detection and a holistic framework top the priorities of the strategic objectives of enterprise risk strategies

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<th>Strategic Objective</th>
<th>Percentage</th>
</tr>
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<tr>
<td>Risk awareness &amp; alignment throughout the organization</td>
<td>70%</td>
</tr>
<tr>
<td>Improving risk monitoring/event detection</td>
<td>66%</td>
</tr>
<tr>
<td>Operational efficiencies and impacts reduction</td>
<td>60%</td>
</tr>
<tr>
<td>Customer and consumer impacts reduction</td>
<td>57%</td>
</tr>
<tr>
<td>Improving risk modeling and scenario planning</td>
<td>54%</td>
</tr>
<tr>
<td>Value chain visibility &amp; resiliency</td>
<td>52%</td>
</tr>
<tr>
<td>Regulatory and legal compliance reporting</td>
<td>48%</td>
</tr>
<tr>
<td>Managing variability in demand</td>
<td>46%</td>
</tr>
<tr>
<td>Capital management/portfolio optimization</td>
<td>45%</td>
</tr>
<tr>
<td>Competitive advantage through risk mitigation</td>
<td>42%</td>
</tr>
<tr>
<td>Enforcing an enterprise-wide framework for risk management</td>
<td>35%</td>
</tr>
<tr>
<td>Risk avoidance with partner collaboration</td>
<td>31%</td>
</tr>
<tr>
<td>Securing executive commitment for risk management initiatives</td>
<td>30%</td>
</tr>
</tbody>
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Source: IBM Institute for Business Value Risk Management Study
Executives are implementing a multitude of modeling tools & analytics to assess, determine impact and mitigate risk effects

Where is your company focusing its key risk management implementation efforts?

- **Modeling tools for monitoring risks**: 85%
- **Risk assessment tools**: 85%
- **Business intelligence & dashboards**: 78%
- **“What-if” scenario analysis**: 75%
- **Operational event management tools**: 72%
- **Risk-adjusted planning**: 71%
- **Advanced analytics & scenario models**: 68%
- **Operational impact analysis**: 67%
- **Analytics for market variation analysis**: 63%
- **Benchmarking best practices**: 60%
- **Mitigation embedded in processes**: 60%
- **Operational & financial integration**: 60%
- **Environmental risk probability assessment**: 53%
However, budget and predicting returns were cited as the biggest barriers to business risk planning and execution.

What is the biggest single barrier to implementing business risk planning?

- Inability to predict ROI from improvements — 37%
- Functional concentration within the organization (silos) — 28%
- Lack of C-level vision and commitment — 14%
- Lack of emerging technologies — 12%
- Lack of best practices — 9%

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We found that 20% of the respondents are incorporating leading practices to predict and manage risks holistically.

Companies in this group share these characteristics:

- Risk management is significant and core to their business strategy
- They have comprehensive, “mature” risk management programs with an established management system, top-down organization and network alignment
- They achieve business value by applying intelligence to monitor, manage and mitigate risks

“The difference today is that we’ve moved beyond defensive risk to take a more holistic view of opportunities.”

Jean-Pierre Bourbonnais, CIO/VP Information Technologies, Bombardier Aerospace
Leading practice maturity includes applying intelligence to predict, monitor and mitigate risks in real time

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<td>Risk management is unstructured/ad hoc within business units. Procedures largely undocumented</td>
<td>Risk management is mostly stand-alone, initiated by risk manager with little influence on business objectives.</td>
<td>Stress testing and scenario analysis take place on an unstructured or ad hoc basis within the context of the BU only.</td>
<td>Risk indicators and measurement mostly within the context of the business unit. Little regular measurement of enterprise risks</td>
<td>Exposures identified and assessed on ad hoc basis or within the context of the business unit only.</td>
<td>Departmental risk data, quality low, few standards, manual extraction of data, information available on a daily basis</td>
</tr>
<tr>
<td>20%</td>
<td>31%</td>
<td>20%</td>
<td>21%</td>
<td>22%</td>
<td>21%</td>
</tr>
<tr>
<td>Risk management sets own objectives and reports to business in a ‘push’-model.</td>
<td>Firm-wide risk appetite is not clearly defined. Risk appetite sometimes measured/evaluated “after the fact”.</td>
<td>Some causal analysis performed. Scenario analysis for most important parts of the business – not always standardized</td>
<td>Insight and monitoring of risk indicators for most important parts of the business – not always standardized</td>
<td>Methods/techniques being standardized. Events and risks modeled for most important parts of enterprise. Limited scenarios</td>
<td>Data standards defined, data not always consistent or reliable. Enterprise information ad hoc – two hour availability (in crisis)</td>
</tr>
<tr>
<td>48%</td>
<td>41%</td>
<td>53%</td>
<td>55%</td>
<td>56%</td>
<td>58%</td>
</tr>
<tr>
<td>Predictive modeling integrated with financial performance management</td>
<td>Consistent analysis monitoring value in real time</td>
<td>Timely risk based optimization of the situation</td>
<td>Insight into customer data and risk indicators across product &amp; geographies</td>
<td>Analytical and simulation modelling represent risk and financial positions for multiple scenarios</td>
<td>Fully integrated &amp; reliable real-time information across the enterprise</td>
</tr>
<tr>
<td>32%</td>
<td>28%</td>
<td>27%</td>
<td>24%</td>
<td>22%</td>
<td>21%</td>
</tr>
</tbody>
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Source: IBM Institute for Business Value Risk Management Study
Leaders are applying predictive analytics to reduce risk effects and achieve cost efficiencies, competitive advantage, and growth.

**Value Achieved**

- Cost efficiencies: +24% (24% leaders, 48% other participants)
- Competitive advantage: +23% (23% leaders, 46% other participants)
- Growth: +21% (25% leaders, 46% other participants)
- Brand reputation: +16% (35% leaders, 51% other participants)

**Reduced Risk Effects**

- Environmental: +38% (27% leaders, 65% other participants)
- Operational: +15% (44% leaders, 59% other participants)

**3-Yr Average Sales CAGR**

Over performers = at or above Industry Median CAGR

- +19% (45% leaders, 64% other participants)
The journey to predictive intelligence for managing enterprise risks

Assess for Value
- Use probability-based risk assessment of likelihood, severity, ease of detection for key risk factors
- Conduct risk-based financial impact analysis, decision tree, sensitivity analysis
- Develop risk mitigation strategy
- Develop an implementation roadmap of initiatives
- Develop risk communication plan

Model to Mitigate
- Model risk mitigation scenarios for each major risk factor (market, operational and financial risks)
- Optimize pipeline inventory with risk-based constraints
- Develop contingency plans based upon analytical probabilities
- Select partners for risk mitigation and communicate the plans
- Establish value realization based on key risk indicators and assign responsibility

Predict to Act
- Develop common risk platform of integrated, reliable, real-time information
- Reduce risk exposure through analytical and simulation modeling
- Improve customer insight and risk indicators across products and geographies
- Employ real-time decision making through risk-based optimization tools
- Integrate predictive analytics into operational and financial performance management
IBM’s framework considers the alignment of operations, finance with market influences to Monitor, Manage, Mitigate and Monetize Risk

Monitor, Manage, Mitigate, Monetize

**Market**
- Changing customer preferences
- Competitor moves
- Market volatility
- Product/Service introductions

**Finance**
- Cost efficiency
- Compliance
- Macro-economic factors
- Globalization

**Value**
- Growth
- Brand/Reputation
- Profit
- Competitive advantage

**Operations**
- Demand variability
- Supply disruptions
- Logistics constraints
- Talent/network resources

Applying predictive intelligence
The Predictive Risk Manager is a collaborative, cloud-based solution to assess risks, determine impact and take action: real time

- Collaborative risk program management solution
- Coordinate initiatives and action plans across multiple geographies and 1,000’s of value chain participants
- Real-time monitoring and management of risk events: actions, issues and status
- Risk profile evaluation by business function
- Probability assessment
- Impact analysis
- Financial impact evaluation
- Mitigation plan repository
- Automatic group/community notification of event and action plan
Predictive Risk Manager
DEMO

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