BUSINESS ASSURANCE

VIEWPOINT REPORT

Where are you on the risk management journey?

DECEMBER 2016
**FOREWORD**

Organizations of all types face internal and external factors that make it uncertain whether they will achieve their objectives. The effect this uncertainty has on an organization’s objectives can be referred to as risk.

Today’s business environment is more insidious and competitive than ever, characterized by complexity, rapid change and volatility. For this reason, leading organizations regard risk management as a process integral to decision making.

When faced with a structured approach and integrated in the overall business strategy, risk management moves from a defensive role to become an asset in creating and protecting value.

Leading certification body DNV GL - Business Assurance investigated risk management awareness and practices in a broad sample of its customers.

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**INTRODUCTION**

DNV GL - Business Assurance, supported by the international research institute GFK Eurisko, analyzed how companies deal with risk management, revealing a higher than expected attention to the topic.

Companies apply risk management mainly because of external drivers. In a majority of cases they make use of in house risk management approaches, but they are well aware of the issues at stake. Risk management is of high concern at the upper levels in organizations and a significant number of companies work with dedicated risk management teams.

Furthermore, the perception of risk is starting to move from tangible aspects towards strategic issues and companies recognize that risk management will be playing a crucial role in their overall business strategy and affect their performance in the longer term. There is a will to commit to the topic and businesses expect to improve their risk management capabilities in the medium term (i.e. within 3 years).

In this context, a selected number of companies, hereinafter called LEADERS, are already approaching risk management in a structured manner.1

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1 The LEADERS’ characteristics are reported in the text boxes throughout the report and summarized in the final section, “Profiling the LEADERS”.
The survey was conducted during September 2016. It involved 1,563 professionals in companies in the primary, secondary and tertiary sectors across different industries in Europe, North America, Central & South America and Asia.

The sample consists of customers of DNV GL - Business Assurance and does not claim to be statistically representative of companies worldwide.

The questionnaire was administered using the CAWI (Computer Assisted Web Interviewing) methodology.

The sample includes 132 companies defined as LEADERS. The classification of a company as a LEADER is based on a list of attributes defined by DNV GL - Business Assurance.

The company has a risk management strategy and has set measurable goals on risk management.

The company uses at least one standard, guideline or framework to define its risk management frame.

Risk management is practiced throughout the organization.

When self-assessing maturity, the company claims to be a “leading” or “building” business in risk management.

- Europe 43%
- Asia 39%
- North America 8%
- Central and South America 7%
- Others 3%

Figure 1: Companies in the sample. Geographic breakdown.
The graphs report scores obtained by the total of respondents, by respondents in different regions, by large companies employing more than 1,000 people and by LEADERS.

For the reader’s convenience, the word “average” has been used throughout the text to indicate mean scores obtained by all respondents.

In the graphs in this report, green circles highlight data significantly above average. Red circles highlight data significantly below average.

DK/DA represents “don’t know” and/or “didn’t answer”.

Graphs in figures 24 to 31 refer to single answer questions with answers adding up to 100%. All other graphs refer to questions with multiple answers.
There are many possible reasons for and perceived benefits of applying risk management in an organization, and external drivers top the ranking. Questioned on the relevance the participants of the survey rated compliance with codes and legislation (71%), customers’ requirements (63%) and the improvement of stakeholders’ confidence (61%) among top reasons. 64% of respondents mention company policy as an important driver.

About 1 in 2 are motivated by financial benefits obtainable, with rates rising to 62% in North America, where risk management has a stronger financial drive.

Large companies employing more than 1 000 people record above average percentages, demonstrating particular attention to the topic.

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**Figure 3: Reasons for applying risk management**
LEADERS acknowledge value from the full range of drivers.

The main motive for them to apply risk management is because it is part of the company policy. Values for reputational reasons and financial benefits are significantly higher than average.

When rating their risk management efforts, companies feel they are at the right level. None of the respondents think they are doing too much for any risk category: hazards\(^2\), operational\(^3\), financial\(^4\), business\(^5\) or strategic\(^6\) risks.

Almost 1 in 2 claim that strategic risks deserve more attention, denoting how the perception of risk is starting to move from tangible operational aspects towards strategic issues.

RISK IS A UNIVERSAL CONCEPT, AND CAN BE CLASSIFIED IN DIFFERENT CATEGORIES.

HOW WOULD YOU RATE YOUR PRESENT EFFORTS IN EACH OF THESE CATEGORIES?

NOTE: SOME OF THESE CATEGORIES ARE PARTIALLY OVERLAPPING.

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<table>
<thead>
<tr>
<th>Total</th>
<th>HAZARDS</th>
<th>OPERATIONAL</th>
<th>FINANCIAL</th>
<th>BUSINESS</th>
<th>STRATEGIC</th>
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<td>32.9%</td>
<td>24.2%</td>
<td>34.5%</td>
<td>41.6%</td>
</tr>
</tbody>
</table>

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\(^2\) Safety or environmental accidents / damage / natural catastrophes etc.

\(^3\) Equipment failure / supplier failure / ICT failure etc.

\(^4\) Contractual risk / currency risk / liquidity risk / liability etc.

\(^5\) Reputational risk / knowledge drain / license to operate / customer satisfaction etc.

\(^6\) Social trends / market changes / competition / disruptive technologies etc.
LEADERS

132

RISK IS A UNIVERSAL CONCEPT, AND CAN BE CLASSIFIED IN DIFFERENT CATEGORIES.
HOW WOULD YOU RATE YOUR PRESENT EFFORTS IN EACH OF THESE CATEGORIES?
NOTE: SOME OF THESE CATEGORIES ARE PARTIALLY OVERLAPPING.

Most LEADERS believe that they put the right amount of effort on all risk categories.

Interestingly, a significant number of LEADERS perceive that they are ‘overdoing it’ across the board in all the different risk categories, especially for strategic (13%) and business risks (15%).
Organizations of all types and sizes face internal and external factors and influences that make it uncertain whether and when they will achieve their objectives. The effect this uncertainty has on an organization’s objectives is called risk (www.iso.org).

All activities of an organization may involve risks. These may adversely impact organizations in terms of economic performance and professional reputation, as well as environmental, safety and societal outcomes. Therefore, managing risk effectively helps organizations perform well in an environment full of uncertainty and build sustainable business performance over time.

One of the big questions for certified companies and organizations will be how to meet the new requirements addressing risk management.

Clause 6.1 “Actions to address risks and opportunities” of the HLS, adopted in the recently published 2015 revisions of the quality and environmental management systems standard, requires organizations to determine and understand the range of risks and opportunities that need to be addressed.

The strength of this clause lies in connecting risk and opportunity both to an organization’s processes (defined under clause 4.4) and to internal and external influencing factors (clause 4.1) and needs and expectations from interested parties (clause 4.2). We also believe that the inclusion of opportunities is advisable to add the benefit of enhancing desirable effects and not solely focus on adverse effects.

In a recent ViewPoint Espresso survey conducted on our quality management system customers we investigated how companies plan to meet this new requirement. The chart shows the answers from more than 1,200 respondents.

The top 3 rankings for clause 6.1 demonstrate that top managers are committed and understand the importance of addressing risk and opportunity, working to integrate a risk-based approach in their management system, i.e.:

- raising awareness and competence of the management team in the area of risk/opportunity determination;
- promoting risk-based thinking in the entire organization;
- focusing both on operational (process-related risks) and more strategic risks (high-level risks).

The Espresso survey indicates that many organizations plan to implement a structured or semi-structured approach. In our view this is encouraging, as we believe this to be a beneficial way to achieve an effective process.

The complete results from the Espresso Survey can be found here:

dnvgl.com/espresso

RISK BASED THINKING IN THE NEW ISO 2015
HOW COMPANIES WILL MEET REQUIREMENT 6.1 (ACTIONS TO ADDRESS RISKS AND OPPORTUNITIES) IN THE FUTURE.

- Raising awareness and competence of the management team in the area of risk/opportunity determination: 41.3%
- Promoting a risk based thinking in the entire organisation: 40.0%
- Focusing both on operational (e.g. related to its processes) as well as more strategic risks (high level risks): 37.7%
- Using a process for determining the risks where at minimum the outputs/results are documented: 36.2%
- Using a structured and documented approach for determining the opportunities and the actions for addressing them: 35.8%
- Using a defined and structured method for risk determination/assessment (e.g. FMEA, HACCP, HAZOP): 30.4%
- Establishing internal communication and reporting mechanisms in order to support and encourage accountability and ownership of risk: 30.3%
- Measuring risk management performance against indicators: 28.9%
- Allocating appropriate resources for risk management: 22.1%
- Designing and implementing a formalized framework for risk management (e.g. based on ISO 31000 or similar): 12.4%
- Using a mental/not documented and unstructured analysis for determining risks and planning actions for addressing these risks: 9.5%
- Using a unstructured/mental approach for determining opportunities and actions for addressing them: 8.7%
- Don’t know: 8.6%
- None of the above: 1%
- Other initiatives: 0.7%

FUNCTIONS AND DISCIPLINES AFFECTED BY RISK MANAGEMENT

Risk management application is distributed across all process areas. The following chart outlines a general overview on disciplines and functions where it is most often applied.

RISK MANAGEMENT CAN BE APPLIED IN ALL FUNCTIONS / DISCIPLINES OF THE ORGANIZATION. IN WHICH FUNCTIONS / DISCIPLINE IN YOUR ORGANIZATION IS RISK MANAGEMENT PRACTICED?

Legend:
Red : primary process
Green: operat. supp. process
Blue: business process

Figure 7: Risk management application in different process areas

RISK MANAGEMENT CAN BE APPLIED IN ALL FUNCTIONS / DISCIPLINES OF THE ORGANIZATION. IN WHICH FUNCTIONS / DISCIPLINE IN YOUR ORGANIZATION IS RISK MANAGEMENT PRACTICED?

At least one function/discipline structurally applied

Total 1563

<table>
<thead>
<tr>
<th>Discipline</th>
<th>TOTAL</th>
<th>Leaders</th>
</tr>
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<tbody>
<tr>
<td>QUALITY ASSURANCE / QUALITY CONTROL</td>
<td>58.6%</td>
<td>87.9%</td>
</tr>
<tr>
<td>HSE &amp; SECURITY</td>
<td>51.7%</td>
<td>89.4%</td>
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<td>OPERATIONS</td>
<td>45.8%</td>
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<tr>
<td>COMPLIANCE</td>
<td>45.4%</td>
<td>84.1%</td>
</tr>
<tr>
<td>PRODUCT / PROCESS DEVELOPMENT</td>
<td>43.9%</td>
<td>79.6%</td>
</tr>
<tr>
<td>LEGAL</td>
<td>40.8%</td>
<td>72.0%</td>
</tr>
<tr>
<td>INSURANCE</td>
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<tr>
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<td>56.1%</td>
</tr>
<tr>
<td>MARKETING</td>
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<td>41.7%</td>
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</table>

Figure 6: Risk management application to functions/disciplines - General overview
PRIMARY PROCESSES

The primary process area refers to the chain of activities by which the organization’s products or services are realized.

Almost half of the sample applies risk management to operations (46%) and product/process development (44%), while it is less often applied by functions like purchasing (33%), sales (28%) and marketing (18%). The chart shows the functions and disciplines where survey respondents indicated that risk management was structurally applied.

OPERATIONAL SUPPORT PROCESSES

Operational support processes consist of those functions and disciplines that do not directly contribute to the realization of products/services, but are supporting the primary process.

As expected risk management is widely applied in the area of quality assurance (59%). The percentages for disciplines with an impact on company performance, like HSE & Security (52%) or ICT (32%) are lower than expected. Figures are higher than expected for human resource management (32%), which usually isn’t thought of as a risk-sensitive area.
**BUSINESS PROCESSES**

Business processes include the managerial and administrative functions essential for running the business, e.g. strategic planning, legal, finance and accounting, etc.

As we can see, compliance tops the ranking of the areas where risk management is applied. In descending order, the other positions are populated by more strategic issues.

North Americans again score above average for all business process related items.

More than 90% of LEADERS practice risk management in all process areas and they stand out for recording well above average rates for all disciplines and functions.

- LEADERS apply risk management in commercial functions at double the average rate;
- LEADERS’ scores on HSE and ICT are significantly higher (+37% and +38%). The same holds for HR management (+41%);
- strategic planning is practiced by 80% vs. 35% on average, highlighting how the strategic dimension is more significant for LEADERS.

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<thead>
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<th>Top 2 Boxes</th>
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<tr>
<td>Compliance</td>
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<td>Insurance</td>
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<td>Finance &amp; Accounting</td>
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<tr>
<td>Strategic Planning</td>
<td>34.8%</td>
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<th>Europe (n=604)</th>
<th>Asia (n=594)</th>
<th>North America (n=116)</th>
<th>Central South America (n=99)</th>
<th>Large Companies &gt;1000 employees (n=333)</th>
<th>Leaders (n=132)</th>
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</thead>
<tbody>
<tr>
<td>Compliance</td>
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<td>73.3%</td>
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<tr>
<td>Legal</td>
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<td>36.4%</td>
<td>57.4%</td>
<td>84.1%</td>
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<tr>
<td>Insurance</td>
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<tr>
<td>Finance &amp; Accounting</td>
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<td>44.8%</td>
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<td>45.9%</td>
<td>68.5%</td>
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<tr>
<td>Strategic Planning</td>
<td>39.0%</td>
<td>37.9%</td>
<td>46.6%</td>
<td>46.5%</td>
<td>50.8%</td>
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<td>66.7%</td>
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<td>68.5%</td>
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<tr>
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<td>46.6%</td>
<td>46.5%</td>
<td>50.8%</td>
<td>74.2%</td>
</tr>
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</table>

Figure 10: Risk management application - Business Processes
Risk management is bound to middle and upper levels in the company: a relevant number of companies indicate it is structurally practiced by the management team (46%), board members (37%) and middle management (40%).

RISK MANAGEMENT CAN BE APPLIED AT ALL LEVELS OF THE ORGANIZATION.
AT WHICH LEVELS IN YOUR ORGANIZATION IS RISK MANAGEMENT PRACTICED?

Top 2 Boxes
Way of life + Structurally applied

<table>
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<tbody>
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<td>Large Companies &gt; 1000 employees</td>
<td>n=331</td>
</tr>
<tr>
<td>Leaders</td>
<td>n=132</td>
</tr>
</tbody>
</table>

- **Management team**: 57.2% (Europe), 53.4% (Asia), 62.5% (North America), 62.6% (Central South America), 67.9% (Large Companies), 100% (Leaders)
- **Middle management**: 45.1% (Europe), 44.5% (Asia), 50.0% (North America), 46.5% (Central South America), 57.7% (Large Companies), 94.7% (Leaders)
- **Board room**: 38.1% (Europe), 39.6% (Asia), 49.1% (North America), 40.4% (Central South America), 50.5% (Large Companies), 87.1% (Leaders)
- **First level supervisors**: 32.1% (Europe), 36.4% (Asia), 32.8% (North America), 35.4% (Central South America), 46.0% (Large Companies), 72.7% (Leaders)
- **Shopfloor**: 29.5% (Europe), 32.2% (Asia), 23.3% (North America), 32.3% (Central South America), 30.9% (Large Companies), 68.9% (Leaders)

Figure 11: Risk management application - Organizational levels

2 of 3 companies make use of a dedicated risk management team, but 40% of these only have a limited scope.

Large companies appear to be more structured in this respect: 77% have dedicated teams and record higher percentages for broader coverage.
DOES YOUR ORGANIZATION HAVE DEDICATED TEAM(S) OR PROFESSIONAL(S) DEDICATED FOR RISK MANAGEMENT, WITH DEFINED ROLES, AUTHORITIES AND RESPONSIBILITIES?

Figure 12: Dedicated risk management teams

LEADERS practice risk management at higher levels in their organizations.

Almost all LEADERS make use of dedicated risk management teams. Even more significant are the figures for teams with full coverage (on all risk categories, levels and functions), which are four times higher than average.
GUIDANCE FOR RISK MANAGEMENT PROGRAMS

There are numerous standards, guidelines and frameworks for risk management application and implementation available, but the respondents’ replies indicate that they are not familiar with them. Increasing communication and education activities on these tools might be helpful.

Risk management mainly follows in house approaches, with just 36% of companies making use of at least one standard, guideline or framework (even partially). Most of them use ISO 31000, COSO ERM and EFQM frameworks.

GUIDANCE ON APPLICATION / IMPLEMENTATION OF RISK MANAGEMENT IS AVAILABLE IN THE FORM OF STANDARDS, GUIDELINES, FRAMEWORKS, ETC. BELOW A LIST OF SOME OF THE MAIN GUIDANCE SOURCES IS RENDERED. DOES YOUR ORGANIZATION MAKE USE OF SUCH GUIDANCE TO DEVELOP ITS RISK MANAGEMENT PROGRAMS?

Use at least partially at least one of the Standards, Guidelines, Frameworks.*

Figure 13: Guidance for risk management programs - companies using at least one

* At least one of the following: ISO 31000 STANDARD; COSO ERM FRAMEWORK (SOX); EFQM FRAMEWORK FOR RISK MANAGEMENT; IRM / ALARM / AIRMIC; AS/NZ 4360:2004; OTHER STANDARDS
GUIDANCE ON APPLICATION / IMPLEMENTATION OF RISK MANAGEMENT IS AVAILABLE IN THE FORM OF
STANDARDS, GUIDELINES, FRAMEWORKS, ETC. BELOW A LIST OF SOME OF THE MAIN GUIDANCE SOURCES IS
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PROGRAMS?

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<th>Model used / followed</th>
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<th>Known, but not used</th>
<th>Unknown</th>
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<td>COSO ERM FRAMEWORK</td>
<td>EFQM FRAMEWORK</td>
<td>IRM / ALARM / AIRMIC</td>
<td>AS/NZ 4360:2004</td>
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<td>3.6%</td>
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<td>24.9%</td>
<td>60.8%</td>
<td>8.1%</td>
<td>8.1%</td>
</tr>
</tbody>
</table>

CoSO ERM= Committee of Sponsoring Organizations of the Treadway Commission - Enterprise Risk Management
EFQM= European Foundation for Quality Management
IRM= Institute of Risk Management/ ALARM= Public Risk Management Association /AIRMIC= Association of Insurance and Risk Managers
AS/NZ 4360:2004= Australian and New Zealand risk management standard

Figure 14: Guidance for risk management programs – knowledge and usage

Percentages of unknown standards and programs are lower for LEADERS. They also record higher levels of usage for all the standards, with ISO 31000 being the most frequently used.
The ISO 31000 standard provides guidance on risk management. It is the most commonly agreed upon standard for risk management and has been adopted by some 25 countries around the world. The COSO 2004 risk management standard is also relatively widespread, but this framework is especially well known in the United States.

**CONTENTS OF ISO 31000**

“ISO 31000:2009 Risk management – principles and guidelines” provides principles, framework and a process for managing risk. It can be used by any organization regardless of its size, activity or sector (www.iso.org, 2016).

The standard starts by giving an interesting definition of risk: “risk is the effect of uncertainty on objectives”. Defined in this way the concept of risk can signify either a negative outcome (an incident or a loss) or a positive outcome (business profit).

In the first part of the standard, a number of principles that support risk management are introduced. The first principle states: risk management creates and protects value. Most companies are used to the concept of risk management protecting value, for instance by mitigating the unwanted effects on the company of unexpected outside events (a strike, bad weather, flooding). But the ISO 31000 standard promotes the idea that proper risk management can also create value, not only by preparing for threats, but also by preparing to take advantage of opportunities that present themselves. Or as some people say: pay attention to both downside and upside risks.

The other principles emphasize the importance of practicing risk management on all organizational levels and in all organizational functions and of making risk management part of decision-making. This means to not only applying risk management after a decision has been made to identify the risk associated with that decision, but to make the analysis of uncertainty part of the decision-making process itself.

The second part of the ISO 31000 standard addresses the management framework. This part identifies the organizational elements (arrangements) a company needs to have in place to be able to practice risk management in a structured and systematic way. The arrangements identified include:

- risk management policy,
- accountability,
- resources and communication,
- reporting mechanisms.

The third part of the standard maps out the risk management process:

- establish the context, identify the associated risk, analyze and evaluate the risk.
- consider that risk in your decision-making process and decide whether you want to address that risk.
- communicate, consult, monitor and review the risk.
The fact box on risk management tools and techniques – see page 28 of this report, provides an outline of the techniques preferred by the survey respondents for the different phases of the risk management process.

**BENEFITS OF ISO 31000**

ISO 31000:2009 has been in use for almost 7 years now and is currently being revised. Although there is not yet extensive research on the benefits of applying ISO 31000, some benefits have been identified.

ISO 31000 offers the opportunity to define a comprehensive and multiple-risk approach. It treats risk not in isolation or silo’s but offers an integrated approach. The ISO 31000 standard builds upon classical risk-approaches already known and practiced by managers, so integration into existing organizations’ practices should be relatively easy. ISO 31000 suggests managing not only the downside risk, but also paying attention to the upside risk, which relates to the possibility of identifying and managing opportunities.

Evidence does suggest that the principal difficulty with managing risk is not selecting a guidance framework, but implementing that framework. The biggest challenge being the tailoring of the framework to the specific and concrete needs of the organization. ISO 31000 is the best-known risk management guideline available today, making it the guidance document of choice for building a structured framework for your risk management program.

**ISO 31000 FAMILY OF STANDARDS**

The ISO 31000 standard is part of a “family” of standards on risk management. Other standards related to risk management include:

- **ISO Guide 73, Risk management - Vocabulary** complements ISO 31000 by providing a collection of terms and definitions relating to the management of risk.

METHODS AND TECHNIQUES

In line with the lack of knowledge of guidance standards, available methods and techniques for each stage of the risk management process are also relatively unknown.

The fact that some of the tools are sector specific does not challenge the above conclusion that methods and techniques are relatively unknown and even less practiced.

A SCORE OF METHODS / TECHNIQUES IS AVAILABLE AT EACH STAGE OF THE RISK MANAGEMENT PROCESS, AS WELL AS FOR REPORTING/RECORDING RISKS. TO WHICH DEGREE IS YOUR ORGANIZATION KNOWLEDGEABLE OF/ MAKING USE OF THESE TOOLS?

Figure 15: Knowledge and usage of methods and techniques for risk management

- **Usage**: on average techniques are used by 8.8% of companies
- **Awareness**: on average techniques are known by 22.8% of companies
- **UnAwareness**: on average techniques are not known by 77.2% of companies
RISK IDENTIFICATION, ANALYSIS AND EVALUATION

The knowledge and use of methods and techniques are evenly distributed for each stage of the risk management process (identification, analysis and evaluation) among those who use them.

Scores are higher for North Americans and for large companies.

A score of methods/techniques is available at each stage of the risk management process, as well as for reporting/recording risks. To which degree is your organization knowledgeable of/making use of these tools?

At least one method/technique used for each cluster

<table>
<thead>
<tr>
<th>Risk Identification</th>
<th>Risk Analysis</th>
<th>Risk Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>Asia</td>
<td>North America</td>
</tr>
<tr>
<td>n=654</td>
<td>n=594</td>
<td>n=116</td>
</tr>
<tr>
<td>37.8%</td>
<td>37.9%</td>
<td>32.1%</td>
</tr>
<tr>
<td>51.7%</td>
<td>49.1%</td>
<td>46.6%</td>
</tr>
<tr>
<td>41.4%</td>
<td>48.5%</td>
<td>40.4%</td>
</tr>
<tr>
<td>50.5%</td>
<td>55.0%</td>
<td>46.9%</td>
</tr>
</tbody>
</table>

Figure 16: Methods and techniques for risk identification, analysis and evaluation.

Leaders make broader use of methods and techniques for all stages of the risk management process.
The Top 3 resorted methods and techniques for risk identification, analysis and evaluation are illustrated in the following tables.

<table>
<thead>
<tr>
<th>TOTAL</th>
<th>LEADERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMEA / FMECA</td>
<td>FMEA / FMECA</td>
</tr>
<tr>
<td>SCENARIO ANALYSIS</td>
<td>SCENARIO ANALYSIS</td>
</tr>
<tr>
<td>HAZOP</td>
<td>HAZOP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL</th>
<th>LEADERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAUSE &amp; EFFECT</td>
<td>CAUSE &amp; EFFECT</td>
</tr>
<tr>
<td>ETA / FTA</td>
<td>ETA / FTA</td>
</tr>
<tr>
<td>HACCP</td>
<td>BIA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL</th>
<th>LEADERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PARETO CHART</td>
<td>DECISION TREE AN.</td>
</tr>
<tr>
<td>DECISION TREE AN.</td>
<td>PARETO CHART</td>
</tr>
<tr>
<td>F-N DIAGRAMS</td>
<td>F-N DIAGRAMS</td>
</tr>
</tbody>
</table>

FMEA/FMECA= Failure Mode and Effects Analysis; Failure Modes, Effects and Criticality Analysis
HACCP= Hazard-Analysis and Critical Control Points
ETA/FTA= Event or Fault Tree Analysis
BIA= Business Impact Analysis
F-N DIAGRAMS= Frequency - Number diagrams
RISK TREATMENT, REPORTING AND RECORDING, MATHEMATICAL METHODS

For risk treatment, methods and techniques are more familiar and more often applied (43%). Reporting and recording tools follow (34%), and mathematical methods appear to be applied rarely (4%).

A SCORE OF METHODS / TECHNIQUES IS AVAILABLE AT EACH STAGE OF THE RISK MANAGEMENT PROCESS, AS WELL AS FOR REPORTING/RECORDING RISKS. TO WHICH DEGREE IS YOUR ORGANIZATION KNOWLEDGEABLE OF / MAKING USE OF THESE TOOLS?

At least one method/technique used for each cluster

Total 1,563

Europe | Asia | North America | Central South America | Large Companies / 100+ employees | Leaders
---|---|---|---|---|---
43.3% | 47.3% | 32.8% | 54.3% | 53.5% | 57.1%
33.9% | 39.8% | 23.9% | 31.9% | 41.4% | 48.4%
3.8% | 4.6% | 2.7% | 4.3% | 4.0% | 7.8%

Figure 20: Methods and techniques for risk treatment, reporting & recording and mathematical methods

Figure 21: Risk treatment - Top 3 methods and techniques

- TOTAL
  - Brainstorming
  - Surveys
  - Nominal Group Techn. Develop.

- LEADERS
  - Brainstorming
  - Surveys
  - Nominal Group Techn. Develop.

Figure 22: Risk reporting - Top 3 methods and techniques

- TOTAL
  - Risk registers
  - Consequence / Likelihood Matrix (Probability Impact Grid)
  - Probability distributions of consequences / s curves

- LEADERS
  - Risk registers
  - Consequence / Likelihood Matrix (Probability Impact Grid)
  - Probability distributions of consequences / s curves

Figure 23: Mathematical methods - Top 3 methods and techniques

- TOTAL
  - Monte Carlo Simulation
  - Bayesian Statistics
  - Game Theory

- LEADERS
  - Monte Carlo Simulation
  - Bayesian Statistics
  - Game Theory
One of the findings of this ViewPoint survey is that overall respondents have relatively limited knowledge of available risk management tools and techniques.

While LEADERS are more knowledgeable and use a comprehensive set of tools to manage their risks in a structured way, a high number of respondents indicate that they do not widely use risk management tools and techniques. However, among those that do, there is a convergence between the LEADERS and the average as to the preferred techniques for each risk management phase/stage:

1. **Risk Identification – FMEA / FMECA**
   - Stands for Failure Modes and Effects (and Criticality) Analysis.
   - The popularity of this tool can be attributed to the fact that it is one of the mandatory techniques to be applied in the context of an automotive quality management system (ISO/TS 16949).

2. **Risk Analysis – Cause & Effect diagram**
   - The most popular technique used in this step is the Cause & Effect Diagram. This is one of the Seven Tools extensively used in quality management and was popularized by Prof. Kaoru Ishikawa.

3. **Risk Evaluation – Pareto chart**
   - Not surprisingly the most popular technique here is the Pareto Chart, which is also one of the Seven Tools of Quality Management. Pareto charts help to “see the forest for the trees” by distinguishing the “vital few” from the “trivial many”.

4. **Risk Treatment – Brainstorming**
   - Brainstorming is a process used to stimulate and encourage a group of people to develop ideas related to one or more topics of any nature. The term “brainstorming” is often used very loosely to mean any type of group discussion, but effective brainstorming requires a conscious effort to ensure that the thoughts of others in the group are used as tools to stimulate the creativity of each participant.

5. **Risk Reporting & Recording – Risk Register**
   - A risk register is used to record and track information about individual risks and how they are being controlled. It can be used to communicate information about risks to stakeholders and highlight particularly important risks. Risk Registers are generally of most use at an operational level where there are a large number of risks, controls and actions needed to improve controls.

All five tools and techniques outlined above are applicable to companies in any industry and sector. (For more details on each, please see the appendix.)

For a broader overview of available tools and techniques, a useful guidance document will be the upcoming new release of the ISO 31010 standard IEC 31010 Risk Management – Risk assessment techniques. It features a comprehensive overview of risk management tools and techniques, including guidance for their use.
RISK MANAGEMENT RELEVANCE FOR OVERALL BUSINESS STRATEGY

Companies have clear ambitions on risk management and are aware of its importance, as we can see from the chart below illustrating the relevance of risk management for companies’ overall business strategy.

1 in 3 already acknowledge its importance (the ratio grows to 1 in 2 for larger businesses). Moreover, projecting the question 3 years from now, the scores increase: 52% of business claim that risk management will be key to their overall business strategy.

Pressure from internal and external regulators is an important driver. Moreover, the fact that the new ISO 2015 standards now contain specific requirements on the application of risk management in both strategic and operational company processes might have influenced these results. 7

There is no gap between present and future risk management aspirations for LEADERS. They already deem risk management relevant for their company’s overall business strategy.

| % future - present | 16,0% |

Figure 24: Risk management relevance for overall business strategy - Gap between current and future situation

1 company in 2 already have a risk management strategy/policy (the rate grows to 60% for large companies and to 62% in North America) and 43% set measurable goals.

7 See also at pages 11–12 the section on ‘Risk based thinking in the new ISO 2015’
LEADERS adopt risk management strategies and set measurable goals.

Questioned on their risk management maturity level, very few companies assess themselves as belonging to the “leading and building” categories (around 20%).

But companies indicate that they expect significant growth 3 years from now (47%), thus demonstrating their willingness to commit to the subject.

LEADERS claim to be advanced (leading or building companies) and expect to further reinforce their positions in the medium term.
FROM A RISK MANAGEMENT MATURITY POINT OF VIEW WHERE WOULD YOU POSITION YOUR COMPANY ON A 5 POINT DEVELOPMENT SCALE?

Current situation

<table>
<thead>
<tr>
<th>Total 1563</th>
<th>Europe</th>
<th>Asia</th>
<th>North America</th>
<th>Central South America</th>
<th>Large Companies &gt;1000 employees</th>
<th>Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=654</td>
<td>n=594</td>
<td>n=116</td>
<td>n=99</td>
<td></td>
<td></td>
<td>n=132</td>
</tr>
<tr>
<td>Leading</td>
<td>5.0%</td>
<td>2.2%</td>
<td>5.2%</td>
<td>2.0%</td>
<td>6.6%</td>
<td>27.3%</td>
</tr>
<tr>
<td>Building</td>
<td>18.7%</td>
<td>10.6%</td>
<td>29.3%</td>
<td>23.2%</td>
<td>28.2%</td>
<td>72.7%</td>
</tr>
<tr>
<td>Developing</td>
<td>30.4%</td>
<td>24.4%</td>
<td>23.3%</td>
<td>32.3%</td>
<td>28.8%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Starting</td>
<td>26.5%</td>
<td>21.7%</td>
<td>19.0%</td>
<td>28.3%</td>
<td>17.7%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Discovering</td>
<td>12.1%</td>
<td>24.6%</td>
<td>13.8%</td>
<td>9.1%</td>
<td>8.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>DK/DA</td>
<td>7.3%</td>
<td>16.5%</td>
<td>9.4%</td>
<td>5.1%</td>
<td>10.6%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Figure 27: Risk management maturity

Future

<table>
<thead>
<tr>
<th>Total 1563</th>
<th>Europe</th>
<th>Asia</th>
<th>North America</th>
<th>Central South America</th>
<th>Large Companies &gt;1000 employees</th>
<th>Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=654</td>
<td>n=594</td>
<td>n=116</td>
<td>n=99</td>
<td></td>
<td></td>
<td>n=132</td>
</tr>
<tr>
<td>Leading</td>
<td>19.3%</td>
<td>8.4%</td>
<td>24.1%</td>
<td>35.4%</td>
<td>26.4%</td>
<td>68.2%</td>
</tr>
<tr>
<td>Building</td>
<td>37.2%</td>
<td>21.4%</td>
<td>36.2%</td>
<td>33.3%</td>
<td>34.8%</td>
<td>22.0%</td>
</tr>
<tr>
<td>Developing</td>
<td>22.0%</td>
<td>26.1%</td>
<td>18.1%</td>
<td>18.2%</td>
<td>17.1%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Starting</td>
<td>6.6%</td>
<td>15.0%</td>
<td>4.3%</td>
<td>5.1%</td>
<td>5.4%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Discovering</td>
<td>4.9%</td>
<td>9.3%</td>
<td>0.9%</td>
<td>2.0%</td>
<td>1.8%</td>
<td>1.5%</td>
</tr>
<tr>
<td>DK/DA</td>
<td>12.3%</td>
<td>19.8%</td>
<td>16.4%</td>
<td>6.0%</td>
<td>14.5%</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

Figure 28: Risk management maturity in 3 years time
Close to all respondents agree that basing their management systems on a structured risk management approach will bring added value to the organization and its stakeholders.

TO WHICH EXTENT DO YOU AGREE WITH THE FOLLOWING STATEMENT: “ENSURING THAT OUR MANAGEMENT SYSTEM IS BASED ON A STRUCTURED RISK MANAGEMENT APPROACH WILL BRING ADDED VALUE TO THE ORGANIZATION AND ITS STAKEHOLDERS”

Figure 29: Added value from risk management approach

Top 2 Boxes
Strongly agree + agree

<table>
<thead>
<tr>
<th></th>
<th>Total 1 563</th>
<th>Europe n=654</th>
<th>Asia n=594</th>
<th>North America n=116</th>
<th>Central South America n=99</th>
<th>Large Companies &gt;1000 employees n=333</th>
<th>Leaders n=132</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>84,7%</td>
<td>73,9%</td>
<td>82,8%</td>
<td>90,9%</td>
<td>89,7%</td>
<td>94,7%</td>
</tr>
<tr>
<td></td>
<td>(5,0%)</td>
<td>(9,2%)</td>
<td>(3,5%)</td>
<td>(1,0%)</td>
<td>(2,5%)</td>
<td>(0,8%)</td>
<td></td>
</tr>
</tbody>
</table>

Almost all LEADERS agree that basing management systems on a structured risk management approach brings added value.
ASSESSMENT AND CERTIFICATION

64% of companies believe that certifying/assessing the risk management program against an international standard can add value. About 22% substantiate this response by pointing to customer requirements, while another 40% see it as an effective way to develop the risk management system.

Among the last group, 10% of the respondents feel that risk management will be of help in maintaining their management systems, and 21% consider it relevant for improving them.

DO YOU SEE VALUE IN HAVING YOUR COMPANY’S RISK MANAGEMENT PROGRAM ASSESSED/CERTIFIED AGAINST AN INTERNATIONAL STANDARD (E.G. ISO 31000)?

Figure 30: Value of risk management assessment/certification programs

LEADERS clearly recognize the value of assessed/certified risk management programs (80%).
MEDIUM TERM INVESTMENTS

The intention to invest in risk management in the medium term (next 3 years) is practically unanimous. About 90% will maintain or increase current investments.

LEADERS will keep investing in risk management. 9 in 10 will maintain or increase investments.

DOES YOUR COMPANY PLAN TO INVEST IN RISK MANAGEMENT IN THE NEXT 3 YEARS?

Figure 31: Investments in the medium term
OUR FINAL THOUGHTS

Risk management represents a key asset for companies, not only to prevent potential disruptions to their operations or major incidents, but for its strategic importance to both protect and create value. Thus, for leading organizations, risk management is already an integral part of the decision-making process.

As seen in this survey, the importance of risk management is generally recognized. Most companies are still applying it mainly because of external drivers and most use what may be perceived as less structured approaches, but the respondents are well-aware of the issues at stake. Risk management is of high concern at upper levels in the organizations and a significant number of companies indicate that they have dedicated risk management teams, even if the scope in most cases seems to be limited.

While most risk management efforts seem to be targeted at more operational risks, the perception of risk among the respondents is starting to move from more tangible aspects towards strategic issues. In addition, companies respond that risk management will be playing a crucial role for their overall business strategy and performance long-term.

Businesses with a structured approach are still in minority, but 1 in 2 of the respondents do expect to improve their risk management capabilities in the medium term. To achieve this, companies see big potential benefits in basing their management systems on a structured, risk management approach. This is in line with the focus on risk-based thinking introduced in the 2015 revision of the main ISO management system standards.

Risk management can bring significant value to organizations and their stakeholders. At DNV GL - Business Assurance, we are firmly convinced that operating a business with a management system that leverages on a structured and robust risk management framework will enable an organization to:

- increase the likelihood of achieving its objectives;
- establish a reliable basis for decision making and planning;
- encourage proactive management and improve the identification of opportunities and threats;
- comply with the relevant legal and regulatory requirements and international standards;
- improve controls and governance;
- improve operational effectiveness and efficiency;
- improve loss prevention, incident management and minimize losses;
- improve stakeholder confidence and trust;
- improve organizational resilience.
GUIDANCE FOR EFFECTIVE RISK MANAGEMENT

For risk management to be effectively introduced and operated, an organization should at all levels consider the following principles.

Risk management shall:

- be an integral part of all organizational processes;
- be part of decision making;
- be systematic, structured and timely;
- be based on the best available information;
- be tailored to suit the organization’s external and internal context and risk profile;
- take human and cultural factors into account;
- be transparent and inclusive, through the involvement of stakeholders and decision makers at all levels of the organization;
- be dynamic and responsive to change;
- aimed at facilitating continual improvement of the organization.

A 10-step roadmap to implement an effective risk management system/approach could consist of:

- **Step 1**: study the guidance as provided in the ISO 31000 standard (or other framework of your choice) and determine its applicability for your organization.

- **Step 2**: obtain commitment, support, budget and approval from (top) management for the risk management system implementation project/process.

- **Step 3**: define the risk management policy, objectives, roles, responsibilities and associated scope for the risk management system under construction.

- **Step 4**: define and document the risk management structure of the organization and the risk management processes to be followed at various business stages and levels.

- **Step 5**: identify, analyze and evaluate the most common and relevant risks for your organization based on historical data and potential future scenarios.

- **Step 6**: establish a risk treatment plan with mitigating actions and objectives for the above.

- **Step 7**: consolidate all of the above (risk management policy, objectives, roles, responsibilities, structure, processes, plans and mitigating actions) in your organization's risk management system.

- **Step 8**: create awareness at all levels in the organization, train staff and assign (sub) systems, processes and activities to ensure the proper functioning of the risk management system as defined.

- **Step 9**: plan and carry out internal audits/assessments, management reviews and improvement actions in order to determine compliance with risk management system requirements and identify possible improvements to the system.

- **Step 10**: continual improvement of the risk management system and full integration in the overall management system of the organization.
LEADERS are aware of the importance of risk management and are aware of its impact in terms of financial benefits and reputational aspects as well.

It is part of company policy for most of them and in many cases they feel that they are ‘overdoing it’ across the board for the different risk categories.

Their approach is advanced; they make use of international standards and guidelines and of recognized techniques, and also make use of dedicated risk management teams inside the company.

Their vision of risk management is strategic. Being aware of its relevance for overall business strategy, LEADERS not only adopt risk strategy/policy, but also set measurable goals.

The topic will remain high on their agenda and they are willing to maintain and increase their investments.
01. LEADERS deal with risk management because it is part of company policy and because of compliance. Reputational aspects and financial benefits are also motivating factors.

02. LEADERS are already covering all the different risk categories, in many cases doing more than what is necessary (especially for strategic and business risks).

03. LEADERS apply risk management in functions and disciplines across all business areas.

04. LEADERS practice risk management at upper levels in their organizations and have dedicated teams with a broad and full scope coverage.

05. LEADERS make broader use of risk management standards, guidelines and frameworks, and of methods and techniques in each stage of the risk management process.

06. LEADERS are aware of the relevance of risk management for their company’s overall business strategy.

07. LEADERS adopt risk management strategies/policies and set measurable goals.

08. LEADERS are well aware that basing management systems on a structured risk management approach brings added value for the whole organization.

09. LEADERS clearly recognize the value of assessed/certified risk management programs.

10. LEADERS will keep investing in risk management in the coming years.
RISK MANAGEMENT TECHNIQUES

The Fact-Box on risk management techniques (see page 28) already provided an overview of the most popular tools and techniques according to the survey response. In this appendix we have provided a somewhat more comprehensive overview of these techniques.

The risk management process starts with risk identification, and the most well-known (and applied) tool here is Failure Modes and Effects (and Criticality) Analysis.

The popularity of this tool can be attributed to the fact that it is one of the mandatory techniques to be applied in the context of an automotive quality management system (ISO/TS 16949).

In FMEA (Failure Mode and Effect Analysis) a team subdivides an item, process or procedure into elements and considers how each element might fail and the failure causes and effects.

FMEA may be followed by a criticality analysis which defines the significance of each failure mode, (FMECA).

FMEA/FMECA is commonly applied during the design, manufacture or operation of a physical system to improve design, select between design alternatives or plan a maintenance program.

FMEA is normally carried out by a team of experts with a trained facilitator.

The output of FMEA is:

- a worksheet with failure modes, effects, causes and existing controls
- a measure of the criticality of each failure mode (if FMECA) and the methodology used to define it;
- any recommendations for further analyses, design changes or features to be incorporated in test plans, etc.

The next step in the risk management process is conducting a risk analysis.

The most popular technique used in this step is the Cause & Effect Diagram. This is one of the Seven Tools extensively used in a quality management and popularized by Prof. Kaoru Ishikawa. The tool is therefore sometimes also referred to as the Ishikawa Diagram, or as the Fishbone Diagram, because of its shape.

In a quality management context, the tool is used to gain insight into the multiple – often interrelated – causes that can lead to a particular event, e.g. a failure. In a risk management context, a ‘mirrored’ fishbone is often used, not only addressing the causes leading to an event, but also the potential consequences of the event.

After completing the analysis step, the next stage in the risk management process consists of risk evaluation.

Not surprisingly, the most popular technique here is the Pareto Chart, sometimes also referred to as the A-B-C diagram. Like the Cause & Effect diagram, Pareto Charts are also one of the Seven Tools of Quality Management.

Pareto charts help to ‘see the forest for the trees’ by distinguishing the ‘vital few’ from the ‘trivial many’.

Pareto charts are useful at an operational level when many possible courses of action are competing for attention. They can be applied whenever some form of prioritization is needed. For example, they can be used to help decide which risk treatments are the most beneficial or which causes are the most important to address.

After the risk evaluation stage comes the risk treatment stage.
The most popular technique at this stage is the familiar Brainstorming technique.

**Brainstorming** is a process used to stimulate and encourage a group of people to develop ideas related to one of more topics of any nature. The term “brainstorming” is often used very loosely to mean any type of group discussion, but effective brainstorming requires a conscious effort to ensure that the thoughts of others in the group are used as tools to stimulate the creativity of each participant.

This technique generates enhanced results when an expert facilitator is on hand to provide proper stimulation when required but does not funnel thinking. The facilitator stimulates the group to cover all relevant areas and makes sure that all the thoughts arising during the explanation of the ideas are captured.

All ideas and thoughts are accepted and criticism is not allowed. The pace is kept up to allow ideas to trigger lateral thinking. The facilitator may suggest a new direction, or apply a different creative thinking tool when one direction of thought is exhausted or the discussion deviates too far. The goal is to collect as many diverse ideas as possible for later analysis.

The final stage of the risk management process consists of risk reporting & recording.

The most popular tool at this stage is a specific risk management tool, a Risk Register.

A risk register is used to record and track information about individual risks and how they are being controlled. They can be used to communicate information about risks to stakeholders and highlight particularly important risks. Risk Registers are generally of most use at an operational level where there are a large number of risks, controls and actions needed to improve controls.

A risk register can be used as the basis for tracking implementation of proposed treatments, and thus can contain information about treatments and how they will be implemented, or reference to other documents or data bases with this information.
CREDITS

PROJECT TEAM

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- Daniele Novello, GFK Eurisko