

Comparative Analysis and Evaluation of Existing Risk Management Software

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The focus of this article lies on the specific features of the existing software packages for risk management differentiating three categories. Representative for these categories we consider the Crystal Ball, Haufe Risikomanager and MIS – Risk Management solutions, outlining the strengths and weaknesses in a comparative analysis.

Keywords: *business intelligence, software packages, risk management, Crystal Ball, Haufe Risikomanager, MIS - Risk Management.*

The role of information systems in the risk management process

Risk management represents one of the most discussed issues for many international corporations, not only due to the ongoing increase of complexity in the business environment but also as a consequence of new legal regulations of international importance, such as the Sarbanes-Oxley Act (SOA).

In order to establish a risk management process able to generate economic value, a company has to implement a system for risk management that integrates various issues: [2,4]

- notification of the most significant threats to the company in the future
- support for decision making by clarifying the trade-off between chances and threats
- estimation of the company's need of capital (own capital) to cover the aggregated risk position of the company
- transparency for the total risk position
- anticipation of potential crises due to risk forecast.

The main factor of success of risk management and thus for the company lies in the implementation of an efficient concept of risk management based on information systems that optimize the information flow e.g. by automated rules for processing incoming information.[3]

An information system for the risk management means an information system to assist decision making containing the data structures, the methods and models that are specific to risk management and providing relevant data with the right content at the right

time and in the right format. This system registers and processes internal data of the company's information systems (e.g. accounting or controlling data) as well as external data (e.g. from public databases).

Existing software packages for risk management

The software offerings on the market show considerable differences concerning their analytic and reporting capabilities. A wide range of offerings exists in particular for the features of analysis, from Excel tables to complex simulation tools. Many software packages include a variety of methods like what-if analysis, aggregation of risks, forecasting methods, illustration of cause-effect relationships or data-mining tools. Some solutions integrate even the so called "management cockpits", specifically designed for the needs of decision-makers. This cockpits concentrate on a reduced space the necessary data this target group needs to get at a glance the situation overview.

The first step in deciding which software is the right one to provide assistance in the risk management process is to select one of the following main categories of software that suit best the situation within the company. [1]

• Category 1 – Standard software packages that can be deployed also for risk management

The specific organizational tasks such as risk management handbooks can be realized with common text processing software like Microsoft Word, while database packages like Microsoft Access enable structured documenta-

tion and data processing and analysis for the existing risk types.

Simulation tools can be used on top as add-ins to table processing software like Microsoft Excel. In this category the software packages Crystal Ball (<http://www.decisioneering.com>) and @Risk (<http://www.palisade-europe.com/risk/default.asp>) have to be mentioned. These tools enable the quantitative assessment of risks using probability distribution (e.g. normal distribution) as well as the option of aggregating risks to a consolidated total risk position.

Although these solutions have the advantage of low cost, they nevertheless require model implementation effort to adapt to the special situational requirements. They assist only partially the activities specific to risk management like risk monitoring and are difficult to integrate with the other information systems of the company.

Let us consider the Crystal Ball solution. Crystal Ball is an add-in to Excel performing Monte Carlo simulation. A few steps have to be followed. In the first step an Excel-based model has to be created including the data input and output calculated as formulas using the input. The second step is the set up of the Monte Carlo simulation by introducing the

assumptions on the input (numerical cells) and the forecasts on output (usually cells containing equations) in the Excel model. The third step sets the preferences regarding the number of simulation trials to run, error handling, sensitivities or precision control. The next step is to run the simulation and finally the fifth step is to visualize and interpret the result. [6]

• **Category 2 – Standardized special software for risk management (or rating)**

These kind of software is also fairly low cost and it is already adjusted to the specific needs of risk management. Mostly there are stand-alone solutions. We have to differentiate the software packages exclusively designed for risk management (e.g. the Risikomanager software offered by the Haufe company in Freiburg, Germany - <http://www.haufe.de>) from the packages that address the common parts of risk management and rating activities covering this way both processes – example: the Risiko Compass software (<http://www.risiko-kompass.de/>) designed by the AXA Risk & Claims Services GmbH in collaboration with RMCE RiskCon GmbH & Co. KG, Germany.

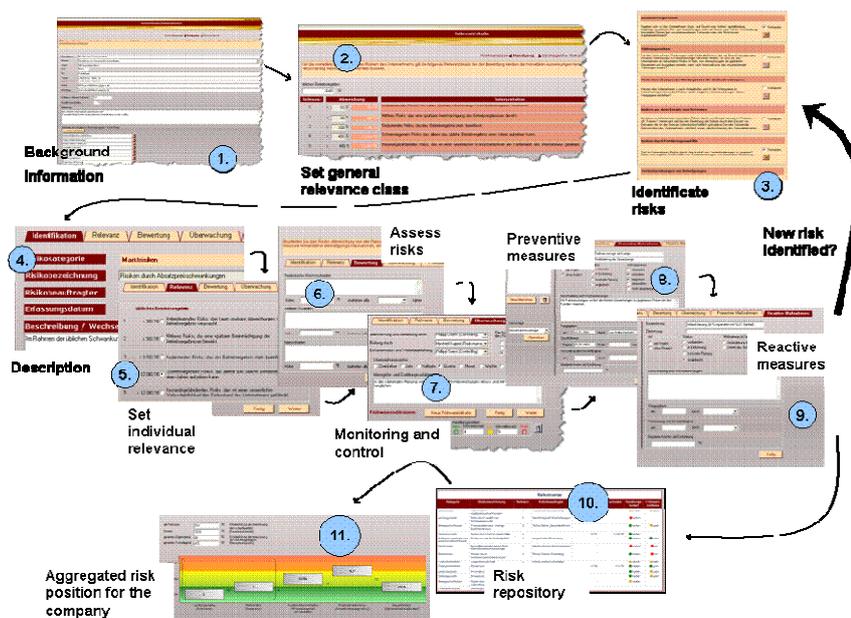


Fig. 1 – Risk Management in Haufe Risikomanager

The mentioned Haufe Risikomanager solution guides the end-user through all risk management activities using a « guided tour » (fig. 1). The first step is the identification of risks using some predefined risk categories and risk areas. Over the next steps different quantification methods are available and several risk-reducing measures can be set. Finally the total risk position for the company can be estimated deploying the so called « fundamental risk equation » using some additional data, although this aggregation is not based on simulation methods.[4]

• **Category 3 – Integrated “Business Intelligence” solutions with risk management features**

Other than the software packages in the previous two categories the Business Intelligence solutions offer a multitude of possibilities regarding customizing according to the specific conditions within companies. They are also fully integrated with the system landscape of the company, mostly as complementary software packages to enterprise solutions like SAP or other ERP (Enterprise Ressource planning) solutions.

This kind of information systems like the MIS – Risk Management solution (www.misag.com) contain a very wide range of features for risk management that enable further the development of traditional con-

trolling and planning methods towards a risk & opportunities-oriented planning.

Speaking of the MIS – Risk Management package, the specific risk management features include to-do lists, risk monitoring, data import, risk repository integrated with the risk identification and risk assessment steps, risk overview, risk aggregation and also comprehensive analysis and reporting features.

In order to reflect in a consistent way all risks with their cause, consequences and interdependencies, this software is based on an enterprise model that integrates the existing planning data. The application is designed in a modular way based on an application server, a relational and a multidimensional database, but all modules access the same database, so the accessed data for risk management is at any time the actual data. [2]

The comparative overview of existing software packages

The features of the different existing software for risk management can be illustrated as a comparison between the Crystal Ball, the Haufe Risikomanager and the MIS- Risk Management software in figure 2 considering the activities of risk management, the analytic features and costs.

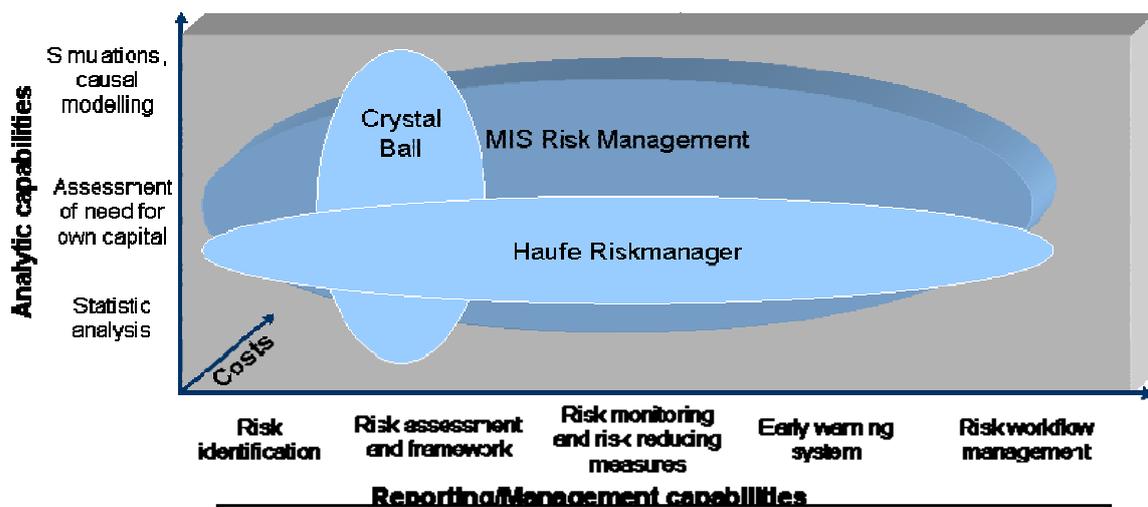


Fig. 2 – Main Characteristics of Analyzed Software

The deployment of Crystal Ball software or similar solutions is to be recommended when

the main target is only to aggregate risks and already a planning modell in Excel exists.

The advantage of this type of solutions lies in the already wide spread utilization of Excel in traditional controlling departments of companies for the planning process and calculations. Considering that Excel does not include simulation features, solutions like Crystal Ball represent the optimal extension for risk aggregation via simulation and the end-user can work within the familiar interface of Excel. Only a brief introduction of the new add-in features is necessary.

For simple models the deployment of Crystal Ball is easy, more complicated models require though much more effort in building the model. Thus to reflect the financial statement, to consolidate the budgets of various departments or to plan over several periods requires more variables, more probabilistic distribution and calculated figures. That can lead to lower processing speed, lower performance of Crystal Ball and this way to increasing simulation time. These problems show the limits of Crystal Ball deployment, especially for complex structures specific for large corporations.

Another aspect is that an automated storage for the results is not possible and thus neither building a history of results, which is an important requirement for a continuous risk management process. Risk management based on Excel and Crystal Ball cannot ensure the continuity of risk monitoring. The mentioned limits of this alternative imply the necessity to integrate other solutions in order to ensure the data flow required for setting-up the model on which relies the simulation in Crystal Ball.

This last aspect is assisted by solutions like Haufe Riskmanager or by Business Intelligence solutions, both able to set up a complete system for the risk management in a company.

The Haufe Riskmanager offers beside the identification and detailed description of risks also features to define and store organisational guidelines and the responsibilities for risk monitoring. For the risk assessment feature and for the aggregation to a total risk position is only available a limited methodology that does not allow the use of simula-

tion to aggregate risks. At the same time the total risk index as a result of the « fundamental total risk equation » does not permit the integration of the interdependence relationships between various risks and of the compensation effects that can appear.

This type of software is able to cover the main aspects regarding monitoring, identification and assessment of different risks. Though as far as the accurate calculation of the aggregated risk position concerns the implementation of additional solutions should be considered. The risk assessment is also based on a special form of binomial distribution, that represents only one of the various assessments methods based on the probability distribution. That leads to a limitation regarding the exact description of the risk appearance and manifestation. Haufe Riskmanager is designed as a stand-alone solution, restricting this way the integration of external data sources that could enlarge the information the responsible person can consider in assessing a certain risk.

Much more possibilities are ensured by the risk management solutions based on Business Intelligence, especially regarding the integration with the system landscape of large companies. Almost all necessary data can be extracted from the transactional systems and can be consolidated on the required granularity level for the risk analysis. Beside the monitoring and aggregation features using simulation the reporting capabilities of risks and of simulation results can be used on a large scale with good performance thanks to the multidimensional concept for data storage.

At the same time we have to mention the financial considerations linked to the implementation and administration of Business Intelligence solutions. The required budget is substantially higher than for the software in the first two categories, not only for the installation, but also for customizing the data model of storage and reporting. Thus solutions like MIS Risk Management are implemented mostly by large enterprises with a complex organizational structure, active on international markets.

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