A New Dimension in Risk: Spreadsheet risk

How to optimize and better manage the shortcomings of this new risk type

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Current Situation

Unlike any other software tool, spreadsheet programs have found their way into everyday reporting. This is in part due to the low initial price and also to the pre-existing knowledge that most employees have. Furthermore, easy access and existing possibilities quickly make spreadsheets the tool of choice when employees want or need to implement individual report requirements. The flexibility with which data can be manipulated and individual calculations can be carried out is especially valued. This extends even to complex spreadsheet programming.

On the report receiver's side, there is also abundant criticism, such as:

- No access to original data, no data history generation.
- No versioning; different versions contain different results.
- No documentation; the know-how depends on the spreadsheet creator.
- Partially unintelligible macro writing.
- Revision lacks data security and traceability in manually created reports.

The criticism sometimes even goes to the point that boards of directors and IT managers consider spreadsheets to be a serious risk.

In line with compliance of statutory provisions, in particular Basel II, IAS and Sarbanes-Oxley, there is even frequent talk of overuse and overreliance on spreadsheets.

"The finance industry is becoming more and more conscious that an overuse of spreadsheets is a key indicator for operational risks that can be directly transferred to regulatory costs," said Jost Dörken, General Manager of SAS Germany.

Outside consulting companies such as KPMG have even determined in an independent analysis that 90 percent of all spreadsheet solutions are inaccurate and, according to Hackett Group, 95 percent of all companies still plan with Excel or a pencil and paper.

Against this backdrop, we have to take into consideration which professional reporting requirements must be met, how they can be met and where the spreadsheet programs can be utilized.

Report Creation Process

In order to understand the advantages and criticism of spreadsheet programs, the prevalent process of report creation should first be presented in detail.

CSV files that are generated in operational systems or analysis data pools are usually the foundation for the reporting process. Therefore, direct access to databases is rather rare. The imported raw data have to be prepared before the analysis starts. This manual and time-consuming process is further hindered by the limited data quantity per worksheet and leads to correspondingly complex, convoluted spreadsheets.

Calculations are most often compiled for the analysis as macros or small, embedded programs from the departments that can range from simple calculations to complex mathematical and statistical processes.

The calculation results are then prepared for presentation in a separate spreadsheet and sent out via e-mail. The final spreadsheets from the different departments are often subsequently compiled as part of a report portfolio, printed and provided to management or forwarded to the responsible parties as an e-mail attachment.

This results in numerous process steps:

- Data preparation
- Calculations
- Presentation
- Distribution

However, only two tools are used for these steps: the spreadsheet program and an e-mail program. An automatic analysis does not take place.

Requirements for Risk Control

Financial supervisors and accountants increasingly require that the previous processing of spreadsheets be based on a secure, transparent and traceable foundation. This is discussed in detail below.

Overview

A primary goal of risk controlling is to secure the risk-bearing capacity (the risk appetite) and thereby the stability of a bank. In order to do this, policies and processes are established to determine the risk, on one hand, and on the other hand, set organizational policies that guarantee a secure and traceable structure and procedure for the policies. Reporting is both the foundation for management as well as the foundation for controlling process and therefore plays an important role. Reporting must fulfill both content as well as organizational requirements.

Strategy and Organization

The requirements on the structure and procedure organization within risk controlling are primarily related to a strict functional separation between handling and reporting persons as well as decision makers. The goal of this functional separation is to provide correct and transparent information to all participating persons for the purpose of successfully implementing strategies. In order to ensure this division, analytical software solutions must support this separation.

A solution that is strictly organizational, for example the “principle of dual control,” can still secure the transparency and correctness of the process for a few complex processes. With increasing complexity, solutions that are strictly organizational reach their limit and the implemented software solution must support the requirements of the functional separations for the entire process through a sophisticated authorization concept

Risk Management & Control

At banks, the areas of risk management and risk controlling are responsible for the identification, evaluation, management, supervision and communication of risks

Identification and Evaluation

The most creative phase is the identification of the individual risks and the evaluation and measurement of the known risks. In this creative phase, people are occupied with the still-unknown process of data management and the structuring of the calculation. Flexibility is required to feed all of the company’s information into the analysis. Furthermore, new ideas must be continually quick to implement.

In this phase, a software solution must advance the analysts’ creativity and must not be constricted by too rigid a framework. Employee expertise creates the sole distinguishing feature for the company.

Supervision and Management

For supervision and management, the identified risks go through a routine process that again consists of data management, calculations and presentation of the analysis. The result of this process is implemented by the decision makers for the management of the company’s objectives and strategies.

This routine process can be carried out either manually or automatically, although the organizational guidelines must be taken into consideration. From experience, all but very simple manual processes are highly error-prone. With automated processes, in the event of an unsuitable solution selection, the ideas generated during the first phase must frequently be changed one more time into a productive IT system. In these situations, misunderstood economy leads to prototype solutions being implemented. The expected initial cost advantage is generally far outweighed by the disadvantages of day-to-day business, such as stability and personnel-intensive human resources. This leads to a considerably more expensive solution over time.

In lieu of this, the goal is to include the results of the risk supervision in a system for the profit management and risk management of the entire bank.

Immediate Reporting Requirements

In addition to the preceding requirements, which result from the organizational point of view, there are also immediate reporting requirements.

Correct, Traceable and Informative

One of the easiest and most reasonable requirements is the correctness and consistency of the results. The goal of every analyst is to first produce accurate results. However, everyone knows that two analysts will present spreadsheets with different results on the same subject. The costly process of troubleshooting then begins, which can affect the entire chain of data preparation, calculation and presentation. A slightly different data selection, differing perceptions in the calculation logic or functional processes are, in addition to the actual errors, the most frequent cause for inconsistency and incorrectness.

Regular and Automated

In addition to report creation, data preparation should also be regular and automated. Both should be a routine, standardized process. As simple as this requirement may sound, it is actually difficult to implement. The process chain depends on the connecting of various components of data preparation, calculation and presentation with one another. The more components there are, the more difficult the task is. The consistency of this process is not offered by MS Office products alone. Labor-intensive Excel results are again time-consumingly entered and maintained in a PowerPoint presentation as a result of changes in the data. There is no automation here.

Even here, the use of spreadsheet programs has its pitfalls. Spreadsheets are tailored for interactive use, and after intensive macro programming only rarely offer more than a half-automated procedure. Many manual interventions are usually required to connect the individual spreadsheets in the process chain.

In particular, the securing of an accurate operation requires a high human resource allocation. Twenty-five thousand work days are required for the budgeting of US$1 billion in transactions (Hackett Group).

Early Identification of Risks and Exceptions

An important element of automated processes is the early identification of risks and exceptions. Exceptions are identified after the fact, in that defined limits have been exceeded. Early identification is an ex-ante perspective that determines the reporting of defined risk indicators (key risk indicators). Depending on the size of the organization, there are an abundance of limits and risk indicators to be monitored. Although the defining of limits and thresholds represents a task very specific to the organization and, with regards to content, is equal to the identification of risks, the real-time automated supervision and communication of the results is the success factor for risk prevention. Spreadsheets may, therefore, be used for the content development of risk indicators, but may only be suitable for its supervision in a limited capacity.

Presentation, Evaluation and Recommendations

The presentation and evaluation of the results is a high-level interactive process. The analysts evaluate the risk situation and comment on the current state as substantiated by current presentations. If necessary, recommendations for actions and alternatives are also developed and presented to the decision makers. In this area, spreadsheets show their entire strength in the interactive development of documents. There is no alternative to the interactive development of the texts. The results and calculations should, however, no longer be altered at this stage. An automated process should always be able to convert the workbook back to its original state in the event of errors.

Distribution and Communication

Finally, all of the information must be consolidated and distributed. Within an organization, there are different user categories:

- Report consumers with minimal reporting requirements.
- Report producers with average reporting requirements.
- Departments with high requirements.

These requirements are usually fulfilled under tight deadlines. The reports are provided to users in printed form and increasingly through the Intranet. Depending on system design, the user is allowed to conduct additional analyses. For example:

- Change in point of view from the highest grouping level to more detailed levels below for decision makers as report consumers.
- Connection of different information through departments as report producers.

- Further development of the analyses by departments.

For revision-proof analysis in the area of spreadsheets, a concept featuring user authentication, data security and dedicated group communications is an indispensable prerequisite. Start centrally, have it available in a decentralized manner and be able to connect it at any time with the current data – and all this globally.

Organizational Equipment

The organizational equipment must be appropriate for the organization's strategy and risk situation: A formulation that naturally requires interpretation.

The organizational equipment must support the bank's goals. For example, complex, derivative business is considered high risk. Therefore, the risk quantification requires complex methods, such as the Monte Carlo Simulation VaR (Value at Risk). Depending on the size of the portfolios, multiple computers or CPUs are required to prepare the results in adequate time. On the other hand, the procedures must be automated and system availability secured, whereby the standards should be taken into account. The primary tasks in this area are as follows:

- Flexible allocation of the IT systems, i.e. hardware;
- Securing the integrity, availability, authenticity, as well as reliability of the data,
- Operational concept, emergency recovery concept.

Of course, these tasks lie beyond the scope of spreadsheets, but, as soon as they are utilized they must work together with all of the aforementioned components. Most spreadsheets are already limited because of the hardware and do not necessarily fit with the organizational strategy.

The authentication is usually secured through the operating system. Individual security measures are only available in rudimentary form or can even be overridden by available programs, if necessary.

Direct interfaces to programs for sequence control and control are also scarce.

Review

All of the above mentioned processes require reviews. The review department shall at any time guarantee, with respect to reporting, by means of a complete and unlimited right to information, the following:

- Compliance with procedures.
- Appropriateness and effectiveness of the internal control system.

Thus, the review department has the difficult task of content, organizational and technical inspection. In lieu of the complexity of the topic and staffing availability, this is quite a difficult task to manage. This task is almost impossible to carry out without software support, especially in the areas of documentation and audit trails.

Because of the previously described inefficiency of spreadsheets in a complete IT infrastructure, they are only revisable through an extremely time-consuming manual process.

Conclusion

Spreadsheets are very popular with users. Because of this popularity, there is frequent talk of overuse and a widespread overreliance on, or even serious risks posed by, spreadsheets. The preceding discussion about risk controlling shows that risks are obvious and by far outweigh the advantages. From a regulatory viewpoint, it is for this reason that spreadsheets are singularly insufficient to meet reporting and management requirements.

Solutions

The challenge is for the user to find a solution that enables the continuation of normal work as much as possible and yet also establish an infrastructure that accommodates the regulatory requirements

Spreadsheet Solutions

These problems are also familiar to the leading producers of spreadsheets. For example, Microsoft combines Microsoft® Office Excel® with Microsoft Office SharePoint® Server based on a Windows® Compute Cluster Server 2003, in order to provide sufficient calculating capacity. The other product advertised by Microsoft for the evaluation of company data, Office PerformancePoint Server 2007, is also based on the strategy of outfitting server-based components with Excel as the user interface. The strategy seems to be clearly in line with confining spreadsheets to those areas that are considered uncritical – user interfaces.

The question is whether this strategy meets the regulatory requirements. In current publications, the words “facilitate” or “moderate” are often used, but there is no mention of fulfillment. A Gartner study addresses this topic:[1]

[1]Office 12 Server-Based Version of Excel Introduces New Paradigm: Betsy Burton und Bill Hostmann, Gartner Research, December 2005, ID Number: G00134688

"Organizations should not assume, however, that, just because the application is server-based, it inherently provides a high degree of integrity and consistency.… The risk to organizations is that, if the application is not managed, they will wake up one day to find a plethora of server-based spreadsheets without the ability to easily manage or control them."

SAS Business Intelligence Software and Solutions

SAS also holds the view that with the new Microsoft strategy (products still have not been released), at least the largest problems related to the use of spreadsheets are being considered. But are they the solution for the regulatory challenges?

In this regard, SAS believes that spreadsheets, even in the new packaging, can only meet the regulatory requirements of modern organizations in a limited capacity. The primary reason lies in the tight interlocking of data, methods, reporting and infrastructure. The less overlap between various suppliers that need to be supported, the fewer the losses and the more predictable the solutions.

The elements of a typical relevant regulatory solution for the determination of capital resources according to Basel II are schematically depicted in the following figure. Three analytical paths clarify the areas for parameter estimation and validation, capital resource determination and credit risk portfolio shaping.

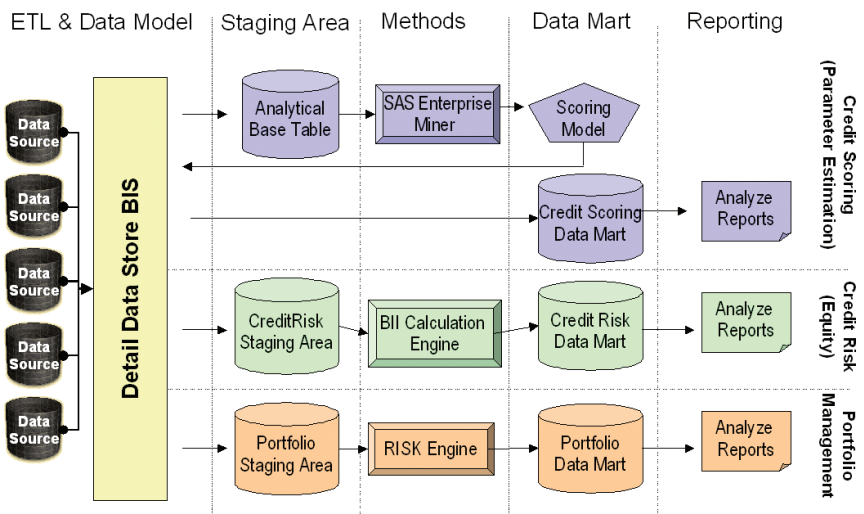

Figure 1: Schematic architecture of a relevant regulatory solution for the determination of capital resources according to Basel II

Data

In figure 1, data manipulation is divided into two large areas:

- The data preparation, depicted on the left with ETL, data model and staging area.
- Reporting relevant data manipulation represented on the right by data mart and reporting.

Approximately 80 percent of project costs in business intelligence or other solutions with an analytical focus flow into the preparation of data. Data preparation encompasses the following tasks:

- Data connectivity.
- Data quality.
- Extraction, transformation, loading (ETL).
- Data migration.
- Data synchronization.
- Data federation.

Reporting-relevant data manipulations are more often performed by departments that select the data in neatly arranged data marts and, when necessary, expand it with simple calculations. The tasks in this area are:

- Data selection.
- Perform smaller calculations.
- Prepare data for presentation.

Solutions that only offer this portion of the data processing overlook the Herculean task of data preparation.

— Read more about SAS data integration online:

SAS® Add-In for Microsoft Office

The SAS® Enterprise Intelligence Platform: SAS® Data Integration

The New Data Integration Landscape.

Methods

The most modern mathematical and statistical methods are needed for the analytical task in risk quantification today. These methods should either be integrated into a solution or should be simple to configure for personal use and be integrated into the process chain.

Only a few software manufacturers offer the analytical depth required today. Most organizations work with an unbelievable range of components from various manufactures or even construct costly internal developments.

Modern solutions must contain a very high level of prefabricated, specialized components that can also still be flexibly tailored for individual needs. The simple preparation of an infrastructure for analysis is no longer current. The cost of implementation and support are then simply too high.

— Learn more about SAS data analysis with Better Answers, Faster.

Reporting

In larger organizations, different users have different report needs. It is necessary to differentiate between companywide report consumers, report users who are familiar with the actual report creation, and the departments that conduct serious data analysis and method development. The IT department, which must convert it all into a productive, automated operation, should also be remembered.

Companywide user

This user works most efficiently when he is personally in the position to compile his own information dashboard from the available information. He wants to be able to answer simple questions and further distribute the results.

Report user

The report user also has additional requirements. In addition to the requirements of the companywide user, this user will be interested in the creation of the OLAP reports. In OLAP reports, the available, very detailed information is grouped according to different perspectives, from which the user can call up the different perspectives and grouping levels himself. Besides the actual creation of the reports, the distribution is naturally an important function. Relevant information must also reach the information consumers, whereby information channels are opened.

Department user

Departments use the data most intensively. Report data marts as well as raw data are frequently needed to develop new methods. The necessary analytical depth requires powerful solutions that are flexible enough to transform vision into action. Interactive data integration, flexible reporting to the point of use of the sophisticated mathematical methods, is the order of the day here. The department user must be able to use the interfaces without in-depth programming knowledge. The application, not the development and quality assurance, of mathematical and statistical functions for the development of methods is the focus.

IT department user

IT departments manage the created reports, develop new methods and implement them in production. This is where an integrated, scalable system pays off, in which reports and methods do not need to be re-implemented for production with professional systems. The administration of user privileges for data, processes and reports should also not be forgotten. An integrated administration of user privileges is indispensable, particularly right now when security and data protection obligations are an absolute requirement.

However, systems with only one user interface, without needing to take the different needs of a company into account and without sufficient integration in IT process integration and management, fall short. Spreadsheets are one component in the process that must be integrated at the correct locations, no more, no less. Present-day solutions must be capable of integration into an existing IT landscape; organizations cannot specify a set architecture.

— For more information about SAS Business Intelligence read The SAS® Enterprise Intelligence Platform: SAS® Business Intelligence

Summary

The present day is unimaginable without spreadsheets. The concerns that are expressed regarding their use in the regulatory arena seem to be more than justified. Whether future solutions in the spreadsheet arena will accommodate theses concerns is debatable. It is only certain that users will not stop using them. SAS Business Intelligence Software offers the solution to this apparent dilemma. It constitutes an analytical platform and architecture in which spreadsheet programs take their natural place as a building block.

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