



Whitepaper:  
A Business Rules approach  
or persist with Spreadsheets?

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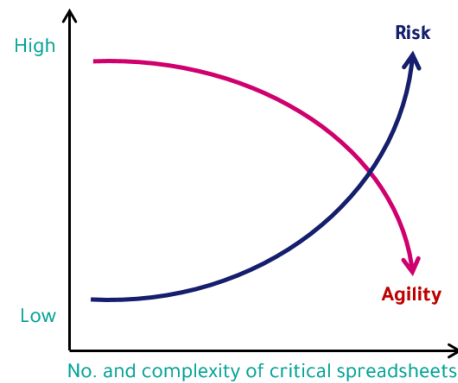
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## A Powerful Business Tool

Even with little training most people can create quite sophisticated spreadsheet models and use them to solve analytical problems. Over time, as people get proficient, spreadsheets get utilised for more purposes to the point that some organisations become heavily dependent on them, and they are critical to their ongoing viability.

Spreadsheets revolutionised accounting practices in the 1980's and some finance departments use them for most of their processes. But when they get complex, errors and mistakes become commonplace and create major risks for businesses. They are also incredibly difficult to modify and maintain, which is a headache when a new report is required or a business change needs to be reflected.



At a departmental level, managers often find only one person knows how the spreadsheets work which creates a key person dependency; or the team spend most of their time entering data rather than variance analysis and reporting.

These are just a few of the issues - but there are many more and the “*European Spreadsheet Risks Interest Group*” provides an independent source of information on the risks.

## Lack of Sophistication

This all happens because of the nature of the problem people try to solve with spreadsheets. Spreadsheets are fantastic for small-medium scale analytical problems, but when things get complex - e.g. large data volumes, multiple users, and data security issues - they can become a nightmare. This is because they lack the capabilities of an enterprise solution:

**Role-based Access:** Spreadsheets don't have the security capabilities to manage users with different roles. So when you need to restrict what users can see and do, you have to separate their data into different workbooks, distribute them and then manually consolidate the results.

**Collaborative Working:** Spreadsheets don't have workflow capabilities to manage activities across multiple users. Where activities need to be sequenced such as input and approval workflows, the spreadsheet has to be manually taken through the process by the owner.



**Business Modelling:** Spreadsheets only have 3 dimensions (i.e. row, column and sheet) but businesses have many - such as products, departments, people, currencies, time periods, and locations - so it's difficult to model a real business and data often has to be repeated across worksheets (e.g. dates or time periods). Analytical solutions use a data model and so can mirror the business dimensions. They can also add-in hierarchies - such as local offices reporting into regional offices, or weeks rolling-up into months and quarters - which enables much better insight into business performance.

**Formulas and Calculations:** Spreadsheets often have links to several other spreadsheets. Finding all these links can be difficult, then editing and updating them within the calculations is error prone and can cause crashes. The 'edit links' feature can lead to inaccuracies and formulaic links are often fragile. Also, formulas are limited by the dimensions of Excel and can break and become unusable if they aren't updated properly - which typically needs the originator.

If you imagine this magnified over a large complex spreadsheet, it's easy to see the opportunity for errors. Analytical tools separate formulas from data, and refer to data by logical field names. By defining the data model and its dimensions, and creating a robust set of computation rules in ORYX, we mitigate these problems and reduce the time taken to run, update and change a process.

**Drill-Downs and Multiple Levels:** Spreadsheets do not support drill down capability, or allow you to work at multiple levels or with multiple dimensions. So you can't easily track back from an unexpected variance or inject data into the analysis at different levels (e.g. if only an average is known for an item).

## Analytical Solutions for Financial Processes

In any medium to large organisation, financial processes will be complex and suffer from some of the issues described above. A key features of analytical solutions is that they formally capture the business dimensions in the data and separate this from the financial processing and calculations you need to perform on that data.

In these solutions the data goes into a conventional database and the question becomes what to do with the data processing and calculations. Within Accountagility's ORYX platform, we take a business rules approach. Here the logic is placed in a set of user controlled rules which prevents them being buried inside a computer programme which only developers can change; or becoming entangled with the data (like in a spreadsheet) where they get hard to change without risk of errors.

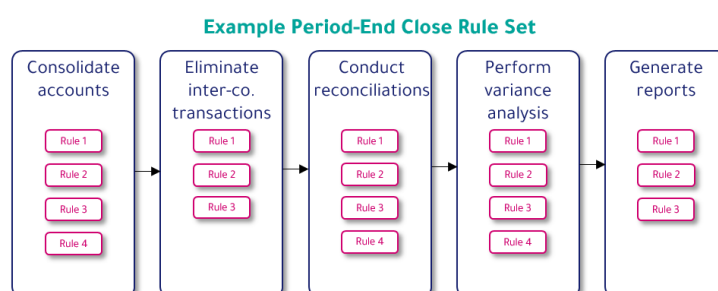


## Business Rules

This separation is important because it makes finance far more agile and able to change computations and reports faster with much less risk. With modern businesses changing all the time, being able to stay on top of business change is critical. If you tangle your business logic with the data model or the software - this just makes it more complicated to change.

Once your business logic is held in a set of rules, it can be tested and checked independently to ensure the processing gives the expected results.

The next step is to group rules into logical sets to aid management. Once this is complete it's easy to see that some of these rulesets can be re-used in other processes - such as the Consolidate Accounts rule set, as shown in the example, being re-used in the planning and budgeting process to bring together actuals data.



So, business rules are all about the separation of concerns and the grouping of logic into re-usable sets. This has several major advantages for finance and the wider business:

- Rules are business-like so you can involve subject matter experts directly in the setup, validation and verification of the logic, and they are easy to document.
- Finance users can make changes directly to the business logic after deployment without the need for IT resources. Which gives control to finance and keeps the cost of change down.
- Rules can be grouped into logical collections (rule sets) which can be reused across different processes. This also enables alternative procedures to be experimented with such as predictive analytics, or a new seasonality profile or an alternative pricing model.
- Rules massively reduce the risk of errors when things need to be changed as the impact is more isolated. If a calculation needs to be changed then it affects just the relevant business rule.
- Rules remove the reliance on individuals and help with compliance as they are business-like, which makes them easier to check and understand and audit.

## Migrating from Spreadsheets and Formulas

Migrating spreadsheets into a business rules solution requires a full analysis of the spreadsheet to extract all of the data structure and the logic embedded in the cells. The idea is not to copy how the spreadsheet works, but to extract

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all the data processing. This can then be set up in the business rules and structured to mirror the logical sequence of actions required by the business.

The task to migrate a spreadsheet into a rule set is similar for most spreadsheets. The first step is to isolate the decisions in the spreadsheet's logic, then to build a hierarchy of rules that can be grouped into rule-sets and reused as much as possible across processes. Finally the formulas are extracted and moved into calculations.

## Summary

The following table summarises some of the above points:

Consideration	Spreadsheets	Rules-based solution
Role-based Access	Not supported. Has to be done manually.	Fully supported.
Collaborative Working	Not supported. Has to be done manually.	Fully supported.
Business Modelling	Limited to the 3 dimensions of row, column and sheet.	Models all the business dimensions fully.
Formulas and Calculations	Linked to the data, so any changes are error prone.	Separated from the data into rules, so changes are low risk.
Drill-Downs and Multiple Levels	Not supported.	Fully supported.
Ease of change	Too easy. There are often multiple uncontrolled edits and numerous worksheets.	Rules can be modified by any authorised person and then saved and tested.
Reliability of results	Low to moderate, as errors are easily made and very hard to find.	High, as rule logic is centralised, visible and can be easily checked.
Risk to business	Very high when complex spreadsheets are developed as they can't be fully tested.	Always low as everything can be tested, documented and verified by audit.

## Final Word and Two Examples

A spreadsheet is not a database and it's not a workflow management tool. Workbooks are documents that can get lost, or end up as multiple versions that need to be manually consolidated. It's easy for errors to get into spreadsheets but hard to find and correct them.



Analytical tools like ORYX on the other hand are great for financial processes, and enable expensive resources to focus on insights and reporting. They can model the business dimensions properly and support the workflow and collaboration required to get outputs, removing the dependency on key individuals.

Even though Excel comes almost free of charge and is easy to use, the cost of your resources and the success of your business are more valuable.

### **Example 1: JPMorgan Chase - Spreadsheet copy-and-paste error**

*JPMorgan Chase suffered a trading loss of around \$6.5 billion in May 2012 due to a spreadsheet copy-and-paste user error.*

The lender was using Excel to create value-at-risk models, and an employee copied and pasted the wrong information from one spreadsheet to another. The formulas within the copied cells were not adjusted accordingly, resulting in gross miscalculations of their synthetic credit portfolio.

### **Example 2: Marks & Spencer - Spreadsheet summing error**

*Marks & Spencer discovered a spreadsheet summing error in July 2016, which forced the retailer to issue a correction to its quarterly trading statement.*

The original statement reported group sales had grown 1.3%, was corrected later showing that group sales had in fact fallen 0.4%. The mistake was put down to double-counting in a spreadsheet used to compile the quarterly statement.

## **A Familiar Story**

It's not the first time a spreadsheet error has embarrassed a company, and US auditors have started to target spreadsheet-based reporting systems as major risks for listed companies subject to the provisions of the Sarbanes-Oxley Act.

Simon Thorne and Patrick O'Beirne are members of the European Spreadsheet Risks Interest Group's (EuSpRig) management committee and they commented:

**Thorne:** "These mistakes are really common ... if there had been testing or planning, it's likely that the mistake would have been seen before this point."

**O'Beirne:** "It's because people don't actually test their spreadsheets but accept an answer if it looks like what they expect or want."



Accountagility specifically developed the ORYX solution suite to address the challenges faced in Finance BUs.

Our solutions are rich with practical, efficient features saving up to 80% of time and effort. We align with the Financial Planning & Analysis and Financial Close markets, defined by Gartner; our Planning and Close solutions are available individually, or together on a single platform. ORYX is one of the few solutions offering the benefit of agile planning, and integrates plans versus actuals utilising our unique 3 step approach.

ORYX features include: Agile Financial Planning, Analysis, Forecasting, Reporting, Cost Allocations; Financial Close, and Consolidation of Group Finance information.

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