



The True Cost of Spreadsheets

A Quantrix Whitepaper



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The True Cost of Spreadsheets

People commonly perceive the cost of spreadsheets to be minimal since they come pre-installed on their corporate desktop. However, the true cost of spreadsheets to businesses would be a surprise to most. One way to calculate these costs is by using the “Total Cost of Ownership”, or TCO, approach by incorporating a set of factors over a certain time period. Factors include ongoing overheads for maintenance, the time and effort spent recovering from errors in business-critical models, opportunity costs associated with a loss of productivity, lengthened turn-around times for model changes, to name just a few. There are other less tangible costs and risks such as errors which lead to diminished customer service (and retention), professional reputation, and competitive positioning.

This paper identifies the following cost factors along with an explanation and key points for consideration:

Loss of Productivity

Spreadsheets are popular not only because they come with the computer but also because they are approachable to the business user. This means the user doesn't need a technical background to develop proficiency with the tool. Users are able to employ their finance skills and creativity to build models that answer straightforward business questions. The problem arises when these models form the backbone of financial planning and decision-making. As time passes, the models expand in terms of the number of cells, formulas, and calculations which correlates to an increase in complexity, rigidity, and risk. Even simple changes often require significant revisions and testing to make sure the logic still works. As models grow, they frequently expand into linked worksheets. Maintaining these linkages becomes a major undertaking – requiring considerable time, effort and expense to ensure that the model continues to function. All these maintenance overheads lead to lost productivity.

Here are some additional points to consider:

- ▶ Spreadsheets are unstructured, meaning they require the user to *first* add data and *then* create the logic, relationships and formulas which drive the model. Unfortunately, this design attribute results in models that don't always answer the questions they were intended to. In many cases, it's necessary to rebuild the model from the beginning as there is little margin for design error. Model building with Quantrix, on the other hand, is inherently more efficient because it allows the user to *first* create the structure and logic of the model and *then* test with sample data (either inputted or imported). If modifications or new directions are necessary, this can be done early in the process, speeding up time-to-answer while eliminating the false starts that erode productivity.
- ▶ Most businesses need to be responsive to changes in customer demands, cash flows, and general business conditions. Changes to spreadsheet models can take hours, days or even weeks as they aren't able to easily adapt to change. Similar changes in Quantrix models take only seconds or minutes, leading to substantial gains in productivity and responsiveness to business conditions.

► Most business professionals prefer to make decisions with timely information. Updating spreadsheets with the latest data tends to break the model, requiring significant time to discover, repair and test. Any changes to data structure or volume need to be closely monitored to determine the impact on the model. Many times a breakage will go undetected until a colleague, client, or auditor discovers numbers or results that don't add up. With Quantrix, you simply use the DataLink™ "update" feature to pull in the latest data. Quantrix has the flexibility to accommodate changes to data sources so that the model scales and adapts as the data source evolves. With Quantrix, getting the latest data is just a matter of clicking a button.

Opportunity Costs

The flipside to the cost of lost productivity is opportunity cost. Opportunity costs are particularly hard to track as they are measured by what you could have achieved with resources that were allocated to activities such as spreadsheet maintenance, error detection, auditing, etc. Many people don't particularly wish to consider what could have been accomplished - but think of the new products, services, and projects that have been thrown on the back burner because of lack of resources, or decisions that were deferred because the "full picture" of information wasn't available. Consider all the resources dedicated to less-than-successful efforts that could have been placed elsewhere had the initial analyses provided better insight for decision-making and planning.

Here are some additional points to consider:

- In times of economic downturn, companies try to do more with fewer resources, making opportunity cost a very relevant consideration.
- Spreadsheet "shortcuts" such as aggregating data to make the model more manageable reduces the level of detail necessary to make precise decisions, leading to less-than-successful projects.
- The axiom "window of opportunity" applies to spreadsheets. The more time spent creating, modifying and validating spreadsheets means less time is available to execute projects within their "window of opportunity".

The Cost of Spreadsheet Errors

One of the more significant spreadsheet design oversights was the anchoring of a formula to a cell. One shouldn't blame the engineers 30 years ago, when spreadsheets were first developed, as they probably didn't foresee how their creation would be pushed to its limits. However, the complexity of business operations has increased to the point where spreadsheet requirements have exceeded capabilities and businesses are suffering the consequences. Most business professionals who have worked with spreadsheets for any length of time have encountered significant errors in models. If they were lucky, these errors didn't incur substantial material impact. However, this hasn't been the case for scores of companies who have experienced serious financial consequences due to spreadsheet error. A major problem is that most serious errors go undetected until a crisis unfolds and management scrambles to mitigate the damage.

Here are some additional points to consider:

- ▶ 90% of complex spreadsheets have errors (Cooper's & Lybrand study).
- ▶ Spreadsheet errors cost money, effort, and time to discover and fix.
- ▶ Spreadsheet errors can jeopardize the reputation of management and the entire company.
- ▶ Business media is replete with spreadsheet 'war stories'.
- ▶ The new accountability environment has legal consequences for error-prone spreadsheets.
- ▶ Quantrix significantly reduces the likelihood of errors because it separates formulas from the cell, resulting in exponentially fewer formulas and errors.
- ▶ Quantrix incorporates a formula validation and eclipsing feature that flags potential errors within the formula or relationships between cells.

The Cost of Scalability

Model scalability is an issue for almost all companies, not just large corporations. Spreadsheets simply weren't designed for creating larger, multi-dimensional business and financial models. Indeed, most spreadsheets have a hard stop at 256 columns and 65,000 rows. This may sound like a lot for the casual spreadsheet user, but if your business maintains any complexity to operations you will likely exceed that limit. Even before hitting physical size restrictions, the performance of most models will deteriorate due to the sheer number of formulas and calculated cells. Large models often have very long calculation processing times, making users loathe to run and test on a frequent basis.

- ▶ As spreadsheets grow, the ability to make changes and updates without breaking the model decreases.
- ▶ Spreadsheets have column and row limitations.
- ▶ As spreadsheets grow, model performance while running calculations significantly deteriorates.
- ▶ Quantrix has developed models over 500 million cells with only a few hundred formulas, resulting in model performance that vastly exceeds spreadsheets.

Cost of Transparency

There is a reason why CFOs, controllers, business managers and others spend a large part of their day creating and working with spreadsheets. They know their professional longevity and ascension is at risk by relying on spreadsheets developed by others. They understand, through painful experience, that most spreadsheets contain hidden errors and inaccuracies that can lead to bad decisions. As such, they can't trust the integrity of the spreadsheet. It thus becomes a rational calculation to avoid attaching their reputation to the spreadsheet if they haven't had a major hand in creating it. Unfortunately, when executives spend a large part of the day with spreadsheets, they aren't able to contribute their full potential value to their company. Most executives didn't invest years of experience and perhaps an MBA only to spend time mitigating risks associated with spreadsheet models. However, that is often the reality with spreadsheet-reliant organizations.

Within many companies, it's not unusual for individuals to amass their own repository of spreadsheets containing important business information. When that person is ill, on vacation, or leaves the company, it can be a real challenge to access that information. When the spreadsheet is located or otherwise becomes available, it can be difficult and time-consuming to decipher how the model works. In a real sense, spreadsheets foster information silos that create inefficient knowledge transfer as well as risk for the company. Quantrix on the other hand contributes to building institutional knowledge as models are highly transparent and "tell their own story". With only a basic knowledge of Quantrix, it is easy to understand exactly how the model works.

Consider the following points regarding transparency:

- ▶ Spreadsheets rely heavily on the original author due to lack of transparency.
- ▶ Spreadsheet collaboration is fraught with the risk of unintended and unapproved changes.
- ▶ Spreadsheets are poor at enforcing business rules.
- ▶ Spreadsheet formulas such as '=E255-H121' aren't meaningful whereas the same formula in Quantrix is 'Net Income = Revenue - Expenses'.
- ▶ Enigmatic spreadsheets lead to employee frustration and poor morale.

In a spreadsheet, the formula for the cost of transparency is as follows:

$$= (B12 * A12) - (C5 * D5) (1 - X92)$$

In Quantrix, the cost of transparency is calculated as follows:

✓ 1. Cost of Transparency = ((Troubleshooting Time * Staff Rate) + (Mgt Review Time * Mgt Rate)) * (1 - Quantrix Savings)

The Cost of Inadequate Review

Reviewing a large spreadsheet in detail usually takes as much time as actually building it. To be thorough, each and every formula must be examined and validated. Oftentimes, a formula is reviewed and then copied and pasted over the original author's formulas to ensure that it is correct. Checking a sampling of formulas is not sufficient as it could be the 45,000th formula that refers to a bad number or blank cell that invalidates the model. Also, there is no real way of knowing how many formulas are in a spreadsheet to begin with; hence, no way of ensuring that all formulas are checked or how much review effort is going to be required. Sometimes, when a spreadsheet review discovers many errors, it can lead to a formal audit. Spreadsheet auditing is a costly and time-consuming effort. Since spreadsheets aren't transparent, auditors frequently need to consult with the model author to understand the spreadsheet. Auditors, particularly from external firms, incur high hourly rates which significantly increase the true cost of spreadsheets.

Consider the following points regarding inadequate review:

- ▶ Reviewing spreadsheets is time-consuming, costly and doesn't add value to the business.
- ▶ Most non-public companies do not adequately review their spreadsheets, which leads to bad decisions based on inaccurate models.
- ▶ The task of spreadsheet review often falls to the side when the true time required to review is not factored into the delivery deadline.
- ▶ Quantrix customer feedback indicates that audit times can be reduced by up to 50%, resulting in substantial savings for those companies that undergo a formal audit.

The Cost of Unintended Disclosure

Proprietary business information such as employee compensation, business strategy, insider trading opportunities, and regulatory matters need to be kept secure and confidential. Oftentimes there are legal consequences when confidential information is inappropriately accessed or made available. Information security is often an intractable challenge within the web of spreadsheets that exist in most companies. With spreadsheets, securing information is often attempted by locking cells and hiding worksheets but these methods are cumbersome and rarely practical. Plus, a quick search of the Internet will provide many options for "cracking" spreadsheet passwords or hidden items, which exposes the company to the risk of malicious intent. Quantrix has addressed the security issue with user roles and permissions. This feature provides an easy-to-use means of granting access to the users of the model. This not only makes models more secure, it also facilitates improved collaboration among employees, consultants, and clients.

Consider the following points regarding unintended disclosure:

- ▶ Litigation involving insider trading claims are significant in time, resources, and money.
- ▶ Unintended disclosure of business strategy can result in loss of competitive advantage as competitors either respond to or counter your capabilities sooner.
- ▶ Unintended disclosure can erode negotiating position with customers, suppliers, employees, investors, etc.
- ▶ Unintended disclosure can result in expensive public relations campaigns to repair tarnished reputation.
- ▶ Unintended disclosure can damage to your personal reputation for failure to maintain confidentiality.
- ▶ Unintended disclosure can result in sunk costs as exposed initiatives are abandoned.
- ▶ Quantrix has addressed the security issue with user roles and permissions.
- ▶ Quantrix user roles and permissions provide an easy-to-use means of granting access to the users of the model
- ▶ Quantrix not only makes models more secure, it also facilitates improved collaboration among employees, consultants, and clients.

The Cost of Support

When a spreadsheet user in the office encounters a problem it often quickly progresses to involve two or more colleagues. It might even be necessary to pull in someone from another department because that individual has developed the reputation as the “guru”. Why don’t people call the spreadsheet vendor? It usually takes only one experience before they abandon that idea. So, while colleagues are pitching in and trying their best to help out, they are also being taken away from their main tasks.

Consider the following points regarding support:

- ▶ Spreadsheet vendors have notoriously poor reputation for supporting their products.
- ▶ Quantrix has developed a reputation for exceeding customer support expectations.

The Cost of Spreadsheets to Your Organization

This paper identifies a number of costs that should be taken into account for organizations that rely on spreadsheets. Clearly, the true cost goes far beyond the initial purchase price. This whitepaper seeks to help business professionals calculate the cost of spreadsheets to their organization. It will become apparent, as it has for leading companies in over 50 countries, that making the switch from spreadsheets to Quantrix Modeler will eliminate these costs while providing improvements in productivity, transparency, accuracy, and security.