

ENABLING
World Class
DECISIONS
FOR GOVERNMENT

The Public Administrator's Guide to Understand & Deploy
Modern Corporate Performance Management Solutions



**Michael Buehner, Corey Barak, Michael Applegate,
Hadrian Knotz, Nils Rasmussen**

E N A B L I N G
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D E C I S I O N S
F O R G O V E R N M E N T

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Contents

How this book is organized.....	1
Chapter 1: Introduction	3
Chapter 2: Planning for the Future.....	14
Chapter 3: Enabling World Class Decision-Making for Government	24
Chapter 4: Assessing Your Organization’s Decision-Making Ability Score.....	38
Chapter 5: Creating a Closed-Loop Planning, Reporting and Analysis Process.....	43
Setting Strategy.....	44
Planning	46
Reporting and Analysis	47
Best in Class Internal Processes	49
Readiness Checklist	51
Chapter 6: Designing Your Own World-Class CPM Model - A Blueprint.....	52
Strategy and Goals	52
Strategic Initiatives.....	55
Budgeting	57
Forecasting.....	66
Reporting & Analysis.....	71
Readiness Checklist	95
Chapter 7: Software Selection	96
Functionality.....	96
Deployment Options.....	109
Technology	110
Chapter 8: Implementation Strategy: Cloud vs. On Premises	113
What is the Cloud?	113
Public Cloud vs. Private Cloud vs. Hybrid Cloud.....	116
Appendix 1: ROI Calculator.....	121
Appendix 2: Integrating 3rd Party Applications to your CPM Solution	122
Appendix 3: How CPA & Consulting Firms can Deliver World-Class CPM to Their Clients	123
Appendix 4: Hardware/Software/Performance Considerations	125
Appendix 5: Security Considerations	126
Appendix 6: Terminology and Definitions.....	128

How this book is organized

To maximize the value and clarity of the book, the authors have organized the chapters the following way:

- **Why** it is important to consider business intelligence solutions to enable world-class decision-making: Chapters 1, 2 and 3
- **How** to best prepare the decision-making processes: Chapter 4 and 5
- **What** to consider when deploying a business intelligence platform Chapters 6 and 7

A Note on the Use of Terminology in this Book:

This book focuses on processes and technologies related to planning, reporting and analysis. Analyst firms and industry experts use various terms and related abbreviations, including business intelligence (BI), corporate performance management (CPM), enterprise performance management (EPM), analytics, and more. For simplicity's sake, the authors will, for the most part, use the terms business intelligence and corporate performance management.

For your convenience, we have also included a glossary at the end of this book.

Chapter 1

Introduction

“The quality of decision is like the well-timed swoop of a falcon which enables it to strike and destroy its victim.”

The Art of War, General Sun Tzu

The purpose of this book is to provide executives with a non-technical guide to help them understand the benefits and capabilities of modern business-intelligence (BI) suites and to assist them in the analysis of their own organization’s current versus ideal-state capabilities to support optimal decision-making. By the time you have finished reading this book, you will be an executive-level expert on this topic so you can help lead your management and project teams to select and deploy a business-intelligence platform that will have a significant material impact on the performance of your organization.

In other words, this book discusses optimizing your organization’s ability to make fast and good decisions by implementing a complete decision-support platform. Before we go into more detail, let us establish what world-class decision-making can potentially do for the success of your organization, and then we will look at how to use BI technology as a major enabler to achieve this goal.

Here are some of the key findings from a survey published by McKinsey & Company. They received 2,327 responses from executives across the world and across all major industries. Companies who responded to the survey reported making decisions related to

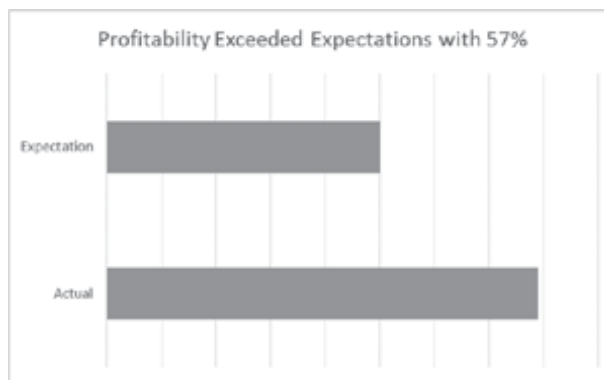
- Product, service, or geographic expansion
- General organizational changes
- Investment in current products, services, or geographic areas
- New infrastructures
- Mergers and acquisitions
- Maintaining the current infrastructure

The same survey also asked respondents about the various discussions that were key to their decision-making processes. One of these topics was the issue of who would participate in the decision-making process. Including workers based on their skills and experiences was believed to increase the likelihood of a positive outcome. According to the survey, when experienced employees were involved in a decision, revenue increases exceeded expectations by 59%; profitability exceeded expectations by 61%; and speed of completion exceeded expectations by 63%. But because of factors such as promotions, turnover, retirement, and lack of well-organized IT systems of record, expertise is often “lost” and not available to new or less-experienced decision-makers.

Additionally, when the decision-making process was transparent to all participants, positive results were seen. Transparency resulted in revenue increases that exceeded expectations by 58%; profitability exceeded expectations by 57%; and speed of completion exceeded expectations by 54%.



McKinsey & Company. 2009. McKinsey Quarterly. "How Companies Make Good Decisions: McKinsey Global Survey Results."



McKinsey & Company. 2009. McKinsey Quarterly. "How Companies Make Good Decisions: McKinsey Global Survey Results."

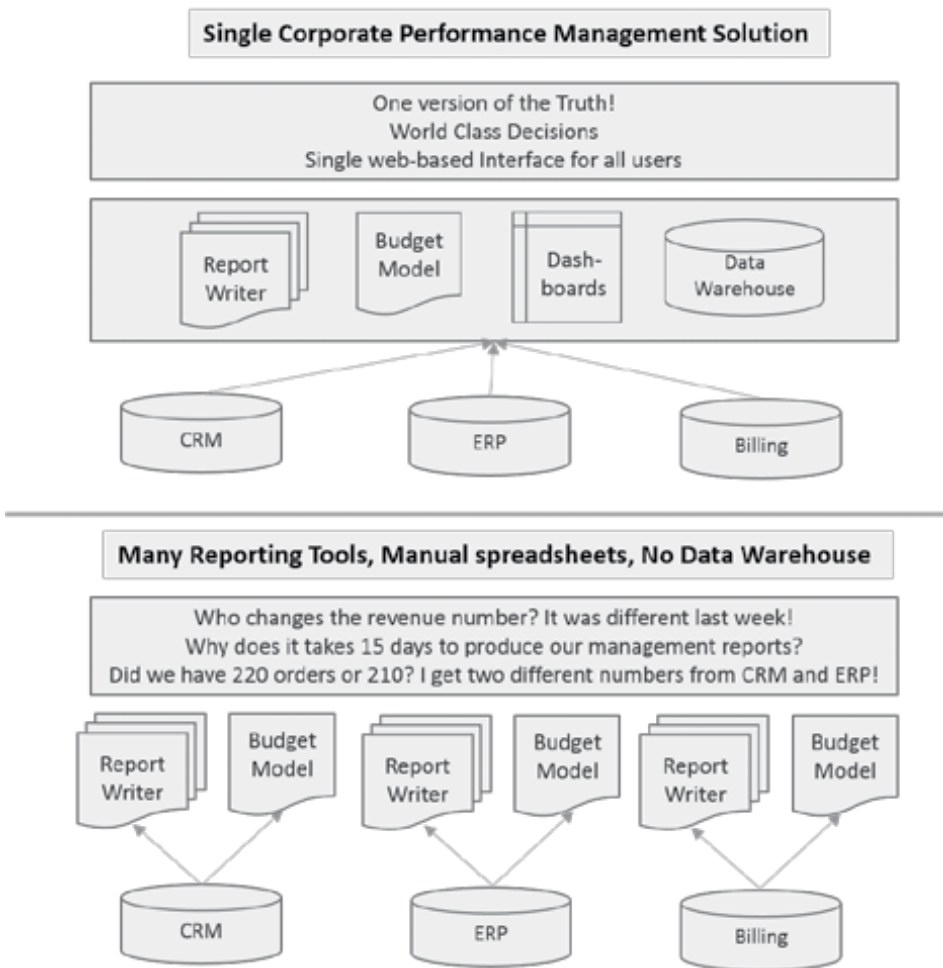
The results from the survey indicate that transparency, alignment with organization strategy and including key employees all help drive the success of the decision-making process. In other words, because of the significant direct impact on revenues and expenditures, apart from the actual designing of a high-quality decision-making process that includes thorough analysis, collaborative discussion and strategic planning, top management should encourage and support the implementation of modern technology to support and enable such critical processes.

So, the goal of this book is to discuss how technology can be used as a key enabler of world-class decision-making across your organization. Instead of implementing a complete, integrated business-intelligence (BI) solution, most organizations have until now lacked a cohesive BI strategy and they are still being reactive to their decision-makers' pursuit of more and better information by just adding a dashboard tool or replacing a report writer. Some try to attack the problem at the transaction level by attempting to build a home-grown enterprise data warehouse or by implementing a budgeting and forecasting point solution and hoping to achieve some incremental benefits. While it is completely fine to replace a specific BI tool, like exchanging an older live ERP report writer with a new one to best serve a small group of users such as the accounting team, you need to think bigger if you aspire to enable world-class decision-making. The reasons are many, as the book will cover in detail, and the return on investment (ROI) can be high by implementing a complete planning, reporting and analysis platform that can serve organization-wide managers and information workers with the key information they need for better decisions. Every organization that wants to be competitive will have this type of platform in the future, and some are already on their way. It is not implemented overnight because a successful solution requires good internal processes as well as reasonably clean transaction data, and of course it requires a highly flexible and user-friendly business-intelligence solution to bring it all together.

Instead of several on premise and cloud BI tools being implemented separately based on how the platform is offered by each vendor, the optimal solution should be integrated and offered in the configuration that is best for you both now and in the future. If that means being completely cloud-based or all on premise or in a hybrid configuration, then the solution should let you do it that way today. Later, without replacing the tool, it should also let you migrate to a new configuration, for example all in the cloud if that is the direction your organization is going.

Piecemeal replacement of different BI software compared to implementing a complete, integrated decision-making platform is analogous to space, automotive and solar entrepreneur Elon Musk's strategy to deliver a world-class product: He has built—and largely taken control over—an integrated supply chain. First, he collects renewable energy through solar panels, then stores it in batteries and uses it to propel vehicles, and then enables automated driving through autonomous technology to make it as easy and safe as possible to get from point A to point B. A complete decision-making platform should do the same: repeatedly pull data (like solar cells collect energy),

store it (like a battery stores energy) and use it for better decisions to get the company from where it is today to where it needs to be in the future (like autonomous driving from point A to point B). If all of Musk's components listed above came from different vendors, with different, not perfectly compatible interfaces, Tesla would likely not have a car business as successful as it is today. With its ability to quickly adapt to changes in technology and consumer demand, the result is that Tesla, despite its size and tenure compared to much larger car manufacturers, often is voted number one by consumers and experts.



A very successful CEO and founder of a large company that the authors of this book interviewed had tried many market-leading dashboard and reporting tools in his career, and none of them had given him the complete decision-making platform he was looking for. He first expressed the business intelligence issues he faced, and all of them are echoed by hundreds of other executives we have spoken with in recent years. He then explained his vision of the “ideal” solution to his issues. In summary, these were the problems he faced:

- 1) Lack of “one version” of the truth when discussing performance.
- 2) Lack of accountability because management commentary was not tracked along with their reports.
- 3) “Analysis paralysis” – too many reports, too many versions and too many reporting tools.
- 4) Lack of core exception reports that immediately is sent to managers when there is an issue.
- 5) Lack of agile, strategically focused, centrally controlled, top-down, bottom-up budget process.

Let’s look at these issues one at a time and then discuss the ideal solution that the CEO was looking for to solve these problems:

Issue 1: Information is spread across multiple transaction systems, and different reporting tools provide different answers. Locally designed reports don’t match numbers from the reports that the executives at corporate HQ are looking at. This leads to a lot of wasted time discussing which numbers are correct and how they are derived. When making decisions, managers need access to both financial and operational data, and they need it in one place with the same definition of KPIs and metrics so they have one version of the truth.

Solution: Implement a central data warehouse that can house all key data required for reporting, analysis and budgeting. This data warehouse should be able to combine data from the ERP system(s) as well as data from the organization’s other data sources, such as the customer relationship management (CRM) system, payroll system, etc. One of the reasons that Microsoft Excel is still the world’s most popular report writer is that almost every transaction-based business software a company owns comes with one or more reporting technologies, many of them rather sub-par, as BI is not the core business of most software vendors, making it almost impossible for a company to deliver a single, automated decision-support platform to its users. So, just like no house builder would build the different rooms (aka different reporting, budgeting and dashboard options) of a house first, and then later attempt to build the house foundation (aka the data warehouse), a company should plan for a data warehouse to contain all important data for the BI solution that will be implemented on top of it later.

With the strong emergence of the cloud for various software-as-a-service offerings, an increasing number of organizations actually find it harder than before to provide a single BI solution to their users because now their data is spread across databases located in-house as well as in the cloud, or databases are located in different clouds such as private clouds, Microsoft Azure and Amazon Web Services. Many such systems have their own application programming interfaces (APIs) for pulling out data to collect it in your data warehouse. So, now more than ever, the integration tool (ETL) itself becomes a critical part of any successful data warehouse. More about this in Chapter 6 and Appendix 2.

Of course, a well-built, easy-to-maintain data warehouse is just a means to an end. What should come next is to enable world-class decision-making for employees via a single, user-friendly BI web-portal where all key reports, dashboards and planning input forms are stored and easily accessed from anywhere at any time. This also helps ensure “one version of the truth” and vastly improves the quality of time spent analyzing and collaborating, and it speeds up decision-making while reducing confusion and potential conflicts.

Issue 2: Managers’ explanations of the same budget variances and exceptions keep changing over time. This is hard to track due to the lack of a central “commentary repository” and linkage back to line items in reports. As a matter of fact, in most organizations, the managers’ comments on variances and exceptions are not recorded in the BI system at all, usually because many BI systems do not offer such capability or the company does not have a formal process to do so. The result is a lack of accountability and lack of insight into managers’ history of comments related to such key data points. The problem gets even worse when a manager leaves the organization and the new person in the same position almost completely lacks reliable insight into explanations from the predecessor, often resulting in a period during which the new person does not take ownership of results or makes sub-par decisions due to lack of knowledge of past actions and events.

Solution: Design an interactive reporting solution that encourages and enables accountability by allowing managers to enter comments by KPI or line item and that allows for reporting and analysis of these comments over time. The company should create a rule that, for example, all actual to budget variances of more than +/- 10% must be explained. Comments should be entered for all significant exceptions prior to scheduled meetings with executives so that these can be studied in advance and the meeting can be focused on problem solving versus looking for information. Even better, the manager that writes the comment should also include his proposed action or solution as part of his explanation.

The BI platform should both allow for in-line comments directly on, for example, exception/KPI reports, and it should also allow for the attachment or linking to full documents, like a Word document or a PowerPoint presentation. This functionality allows more significant issues or opportunities to be discussed in much more detail than shorter, in-line comments entered into a database through a report. By integrating such documents into the BI platform, managers can easily and quickly access them when and where it is important as part of the analysis process, thus enabling faster, higher-quality decision-making.

Issue 3: Having too many reports, dashboards and manual spreadsheets so managers get lost in analysis or simply can’t find it. Lack of a central, easy to access location with updated reports.

Solution: Deploy a single, web-based portal with strong reporting and analysis functionality that allows for collaboration and commentary.

The vast majority of organizations have at least five or more reporting, query and analysis tools for their different data sources. Some are web-based, some use proprietary client-server interfaces, some are easy to use and others are very technical and require IT help to design and maintain; most of them require different training classes and have different security models. In other words, it is a mess! And this is still the situation almost everywhere, seriously hampering the opportunity for managers to use world-class decision-making simply because, even if all the required reports are available, which is rarely the case, data is spread across numerous tools, with different report formats, different skill requirements to use, different logins and different methods to access, etc. In many cases, the required reports are not available, but managers do not know how to modify or create a new report, so it never gets done; users export or enter the data in manual Excel models, or they simply learn to live without that information.

Now, if you have implemented a data warehouse to resolve the issue of data spread across many data sources, you have also enabled the opportunity to implement a single BI solution for analysis and decision-making to eliminate the issue with many reporting tools that was described above. However, once an organization is given a powerful, single BI solution and easy access to all important data through a data warehouse, a new problem often occurs: dozens if not hundreds of reports and dashboards are built by eager users, which easily results in “many versions of the truth” because business rules are defined differently by different users (there are ways to resolve this by the way, with a central KPI repository in the BI tool), and managers simply can’t find the right or the best dashboard or report anymore. This can be resolved by agreeing to standard reports that are maintained by designated staff and flagged/organized separately from individual user-defined reports. It can also be nicely avoided by creating storyboards or playlists that have the best reports and dashboards in the best order of analysis. For example, starting with summary metrics and then going to detailed back-up information that users can use when needed. More about organizing content and reports in Chapter 5.

Issue 4: Managers are not able to monitor their important metrics and quickly take action when there is an issue.

Solution: Create exception reports that are emailed to managers and that require online commentary when there is an exception. The reports should be very simple to read and focused on agreed-upon KPIs.

While implementing a data warehouse to bring all data important for decision-making into a single data store solves the problem of having to use many report writers or having to manually

combine data in Excel, it does not solve the question of *how* the information is consumed by your decision-makers. Even if you achieved the ideal state of only using one report writer and one dashboard tool and they are completely integrated into the same easy-to-access web portal, you may still have a big problem that reduces the quality and speed of decisions. Let's say a manager can do most of his or her analysis based on six or seven KPIs or metrics but that these are spread across a profit & loss report, a sales report, an inventory report and a dashboard. Chances are that this manager will make sub-optimal decisions because the person will miss or forget information while hopping from one report to another. So the power of a simple KPI-based summary report that highlights important exceptions can be huge for world-class decision-making. Such a report should come with links, drill down to detailed transaction reports and dashboards with trend analysis, etc. (see Chapter 5 for examples), so that as soon as the manager finds a problem or an opportunity in the KPI report, he or she can quickly and easily navigate directly to the detailed information for further analysis. Two other key features on such a report should be the ability for the user to enter a comment on the pertinent line items, and the BI tool should also be able to be set up to automatically e-mail the report to the user if there is a flagged exception so that no time is lost in the decision-making process. The commentary serves several purposes, including reducing the need for the same person or other people to go back and repeat the same analysis just to derive the same conclusion. It also provides an ability to do "comment comparison" over time. In other words, if the same issue keeps arising multiple times or it is not resolved, analyzing the comments helps see if the manager's analysis of the problem is correct or why his or her proposed solution actually did not work.

Issue 5: Lengthy, manual planning processes with different, disconnected budgeting and forecasting models. Lack of agility in these models results in slower or sub-optimal reactions to changes in the internal or external business environment.

Solution: Deploy a single, web-based portal that houses budgeting and forecasting models as well as reports and dashboards. Implement a budget process that:

- 1) Starts with a top-down budget version created based on guidelines provided at the Executive level and closely aligned with the strategic plan and strategic goals for the coming year.
- 2) Continues with a bottom-up budget to assure alignment with each department/division. Agree on what information is important for decision-making and control and collect plans at that level.
- 3) Finishes with alignment of the two budget versions and adjustments as required to arrive at the desirable budget.

Housing both strategic plans and goals in the same budget system assures close ties to budgets and forecasts.

The key outcome of best-in-class planning processes combined with best-in-class planning tools should be maximum agility. In other words, if an expected Revenue source does not materialize, or an unplanned major Expenditure (natural disaster?) occurs, this means that your annual budget goes in the trash can. Ideally, you should have an advanced planning tool where your team quickly can model the required revenue/expenditure adjustments needed and make a world-class decision that can save jobs, and meet citizen expectations.

For most organizations, the annual budget process takes three months or more to complete, and it is costly and time consuming and rather the opposite of agile. In the potential crisis scenario above, a top-down, driver-based planning model could save the day and quickly help managers create a re-forecast to give them the metrics they need to get approval for and then implement their proposed actions, instead of months of delays while in the meantime the train is starting to leave the station.

In order to make the road to enable world-class decision-making easier, the CEO that provided the five issues above also had to deal with the fact that several of his subsidiaries were in different industries with local ERP systems. He had the foresight to enforce a policy where a certain portion of each subsidiary's chart of accounts had to follow a uniform standard to make it easier to maintain consolidated reports and to discuss high-level KPIs and financial statements across any of the business units. From prior companies he had built and managed, he was also painfully aware of the fine balance between too detailed, too sophisticated BI vs. too high level information, where the former could result in expensive, consulting-intensive models that are hard for employees to maintain and the latter would result in lack of insight.

In today's fast-paced society, it is more true than ever that the organization that arms its employees with the best, most up-to-date information is the most likely to succeed. No longer is good information enough; it should also be

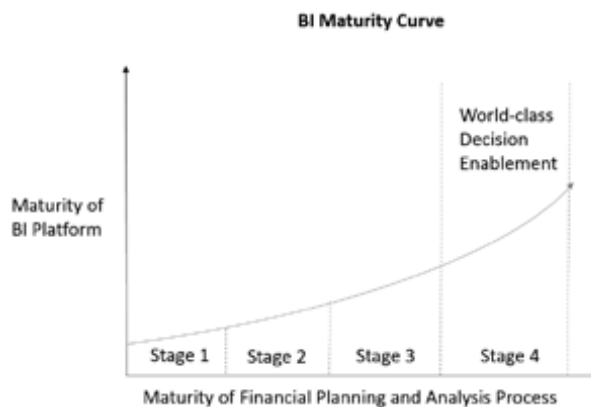
- Accurate
- Full of detail whenever needed
- Transparent and easily available to anyone needing it
- Rapidly available and timely
- Presented in a clear format

Executive Summary

In the vast majority of organizations today, the reporting, planning and analysis situation is quite messy, and employees do not have a unified BI platform to help enable world-class decisions. Although this situation is quite eye opening, at the same time it is a huge improvement opportunity, with potential major impacts on revenues as well as profits, as indicated by the McKinsey survey results referenced earlier in this chapter. In other words, a well-planned and executed BI strategy and the right technology platform represents a chance for top executives to take the initiative to make their organizations best in class. Technological progress and globalization are changing industry by industry at a rapid pace, and successful organizations are able to create or adapt their strategies to take advantage of this rather than being victims of the change. Armed with modern BI technologies, they can analyze trends, quickly reforecast revenues, expenditures and cash requirements to support their initiatives, and enable a standard of world-class decision-making across their organizations.

Throughout this book, you will find ideas that will help you to assess the current state of BI enablement in your organization and how it can be improved to support world-class decisions. As you attempt to assess your own organization's current BI capabilities versus what the true potential can be, you can use the BI maturity curve (see figure below) as a tool to place your firm anywhere from Stage 1 to Stage 4.

Stage on BI Maturity Curve	Maturity of Financial Planning and Analysis Processes and BI Platform
Stage 1	Low
Stage 2	Lower Mid
Stage 3	Upper Mid
Stage 4	High



In the rest of this book, you will find ideas and examples to help move your organization to “Stage 4” in the chart above. It will typically require improvements in process, BI culture and technology platform.

Readiness checklist

Item	Your Score (1 lowest – 10 best)	Your Notes
Clarity on <i>if</i> or <i>why</i> your organization needs a decision-support technology		
Buy-in from key users to improve decision-making capabilities		
Total Score		

Chapter 2

Planning for the Future

“If you can look into the seeds of time, and say which grain will grow and which will not, speak then unto me.”

--William Shakespeare

Purpose

The purpose of this chapter is to help you shape a vision for the optimal decision-making platform that your company should plan for today to be ready for the future. Sure, BI vendors will keep innovating and delivering powerful features that may not even have been requested by their customers yet, but most likely, your company has a lot of homework to do while vendors work on delivering the BI portals and tools of tomorrow that will optimize their customers’ corporate performance management.

Almost no organizations today are close to “BI Nirvana.” They suffer from the burden of maintaining report writers across their different systems and a lack of enterprise-wide dashboards with fine-tuned KPIs. Furthermore, they use manual spreadsheets to present information and to manage all or parts of their budget process. They also lack, or have a poorly defined, enterprise data warehouses to gather all important data, and very few offer their users a single BI portal with mobile apps for easy end-user access from anywhere. This chapter will provide insight into some of the key features to expect from BI solutions in the coming years, and it will discuss areas you can prepare today so that you are as ready as possible to take advantage of this functionality and to help you turn it into a competitive advantage to drive world-class decision-making across your organization.

First, we will look at functionality that can be expected to arrive in BI suites in the near future, and then we will look at how you best can prepare your data and your processes today to be ready to take full advantage in the years ahead.

Expected Future BI Functionality and Your Roadmap

Imagine a future where in one single day you have subscribed to a BI cloud service, loaded data from four data sources, mapped your data to a common data model (profit, customer, etc.) and gone “shopping” in an online application marketplace for 30 different reports, dashboards and budgeting templates. At the end of this *day one* of your deployment, not two or four months later as is typical with BI implementations, you invite your first managers into your new, user-friendly web-based portal to start their first analysis.

Future world-class organizations will not simply replace their old, often specialized BI solutions with new ones as needs occur. Instead, they will start with a detailed analysis of what type of information, in what type of format and with what kind of accompanying decision-support (exception, predictive, etc.) their executives as well as information workers need in order to optimize their decision-making capabilities.

Executives will put high priority on their future BI platform project because they know that an extremely well-planned and executed BI implementation will function almost like an exoskeleton for the business, surrounding every decision-maker with supportive technology to help them make smart and speedy decisions, just like an exoskeleton works to strengthen the speed and power of the human body. However, as any savvy BI user knows, dashboards, reports and forecasts are only as good as the data that drives them. In other words, the organizations of the future that will be leading in their industries because they have successfully implemented a powerful BI platform to enable their employees with world-class decision-making are the companies that already today start cleaning up their transaction data, because this can take years, and it totally defines how successful their BI solution will be. Most companies have “dirty data” everywhere. Customer relationship management (CRM) systems often have poorly filled-out information about campaigns, leads, opportunities, and customers. Accounting systems often have incomplete chart of accounts, or have transaction entries that don’t capture important customer, product or project information. Data issues are almost always prevalent throughout a company’s transaction systems. This prevents them from the ideal situation where they can have 360 degree views of their customers, sales people, products, etc. So, by understanding the importance of good, clean data today, executives can strongly support the re-implementation or purchase of new transactions systems that then will help drive extremely powerful BI implementations in the future and that will enable world-class decision-making and resulting business success.

Let us look a bit closer at the type of features and functionality that will drive successful BI implementations in the future.

BI Platforms in the future

The most successful BI platforms of the future will have *all* of the following characteristics:

- Extraction, Transformation and Loading (ETL)

Earlier in this chapter we discussed the importance of clean data. Well, even if your transaction systems offer good, reliable data, your BI solution is only as good as the data you can load into it, as well as the timeliness of that data. Therefore, the BI solutions of the future will increasingly offer very strong data loading functionality that is able to easily connect to the application programming interfaces (APIs) of your different transaction systems and load data into the BI tool automatically on a schedule as well as on-demand.

- Business Data Warehouses

Half the reason why almost all companies today are not able to give their employees great, timely, on-demand information to support great decision-making is that their data is stuck in numerous different on-premise and cloud data sources, and each one has a different reporting and analysis tool. Not only is it slow and cumbersome to get the information out, but it is almost impossible for users to learn all the different report writers and even harder to effectively combine the data to present KPIs and easily consumable reports and dashboards. This “information handicap” can be resolved by implementing a flexible business data warehouse to manage key financial and operational data. BI platforms of the future will eliminate the need to design such data warehouses in-house. Today, many companies try, and often fail, to build such data warehouses in-house, and even if they should partially or fully succeed, a home-grown data warehouse is not an integrated component of a BI suite and as such will fail to deliver world-class planning, reporting and analysis to their end users. BI vendors see this problem and how it can limit the success of their solutions and thus will increasingly offer configurable data warehouses with full user interfaces and business rules such as hierarchies, currency conversion, and so on. Many will offer it in the cloud as a service, and others will offer it for on-premises installations or a combination of both.

- All Inclusive, Web-based BI Portals with Apps

As discussed earlier, one of the biggest BI problems in organizations today is that users need to access numerous reporting tools as well as compile spreadsheets to retrieve and present the information their decision-makers need. In addition to the critically important ETL and data-warehouse components, all successful BI platforms of the future will offer a single web portal user-interface where BI functionality or modules (“apps”) can be installed on demand. The single web portal is

important so that users only need to access and learn one interface, and administrators only need to maintain one user management and security model. Furthermore, IT doesn't have to install any software on users' computers and they can offer remote access. The "App" concept becomes important for BI vendors to support so that their customers can quickly install the functionality that they want, but even more importantly, the app concept will enable customers or third party developers to add special functionality that the vendor may not prioritize. Whether accessed as a cloud service or installed on premise, future BI web portals will also increasingly be able to consume outside web services such as machine-learning algorithms, exchange rates, and numerous other third party offerings that add value to and help enable world-class decision-making.

Planning and Budgeting in the future

In the coming years, BI platforms will offer fully integrated strategic planning, forecasting and budgeting functionality as part of their BI suites. Here is some of the key functionality that will help support optimal forecasting and budgeting:

- Event-Driven Functionality

BI Suites will increasingly offer automated modelling functionality so that managers quickly can provide forward-looking plans and scenarios that are event driven. In other words, if there is a market crash, a company may quickly need to produce an updated cost reduction budget, or if a company is looking to acquire another business, they may need to analyze the cash flow impact and produce pro-forma financial statements to executives to help them make optimal decisions.

- Purpose Driven

Other important functionality that will be better and easier in future BI suites is the ability for smaller businesses or resource-strapped accounting departments to automatically create budgets or forecasts to be used, e.g. to get a line of credit at the bank or to set commission quotas for a sales team that are dynamically connected back to a budget scenario. This can eliminate the massive use of manual, non-integrated spreadsheets that exists today for special or departmentally-driven micro-planning processes such as the examples provided.

- Strategy Driven

While today, most organizations enter and store their strategic goals and initiatives outside their BI tools, in Microsoft Word or PowerPoint, in the future they will be able to easily

capture these in their BI suite and thus fully integrate the related key metrics in forecasts, budgets and reports (more about this in Chapter 4), thus ensuring that all users have constant visibility to strategy and goals for their decision-making processes. This is extremely valuable to a company because it helps ensure that decisions at all levels are aligned with the planned strategic direction of the organization. A survey published by the Harvard Business Review found that only 5% of employees understand the company's strategy. It is easy to imagine the benefits to a company when the opposite is true, and this can be enabled by including such metrics and information within the BI platform so that strategy and goals are not forgotten and "lost" to employees but instead are constantly visible and available to users to help guide their decision-making processes.

- Automated strategy adjustments

Not only will BI suites of the future be able to automatically integrate strategy and goals into a budget, but the reverse will also be true. For example, if there are changes in, e.g., funding requests because a department suddenly needs to hire 10 people not planned for due to a new product idea, a change in direction or a response to competitive threat, a reforecast due to any of the mentioned events may automatically drive a change to the related strategic goals.

- Budget planning optimization

While preparing an organization-wide budget typically is an arduous process in itself, especially for bottom-up processes where a large number of people are involved in entering and reviewing budgets, it gets even more complicated when advanced business rules and constraints are involved. The actual planning process ends up becoming very complex and time-consuming as a result of numerous decision points that need to be evaluated concurrently, including market demand and funding availability. In future BI suites, planning and analysis optimization techniques will more effectively translate business rules into mathematical formulas that can be used to create dynamic budgeting and forecasting scenarios. Furthermore, integrated algorithms will be able to solve those equations and provide the best budget allocation options among all possible scenarios and types of drivers, such as risk reduction, cash flow targets and profitability goals.

- Machine Learning and Automated Forecasting

According to Wikipedia, machine learning is "the subfield of computer science that gives computers the ability to learn without being explicitly programmed." In recent times, there has been increasing interest in and development of algorithm-driven programs to automate the ability of software programs to perform all kinds of personal and business tasks. In the

field of BI, this includes forecasting future metrics based on historical data as well as current and estimated conditions such as weather, inflationary risk and more. The more variables you add to the mix, the harder it is for a human brain or basic spreadsheet models to figure out, and the better suited advanced algorithms that dynamically update and improve themselves are to perform tasks such as forecasting.

A practical example, often of critical importance to a business, is to forecast future inventory needs as accurately as possible. This is often referred to as predictive analytics and “real-time forecasting” because it can be almost instant without the need to collect forecast data from end users. Another example is in sales, where machine learning and algorithms can look at a large number of variables and patterns and figure out which customer is most likely to buy a specific product from you right now and thus should be prioritized by your sales team. This is typically referred to as prescriptive analytics. In both examples, business intelligence software can enable world-class decisions and help propel a company to the leading position in their industry.

Reporting in the Future

Just like strategy and goals at most companies are often quite disconnected from the budgeting process, and the budgeting and forecasting processes themselves are still rather archaic and manual, so are many reporting processes. In other words, both areas are due for a significant overhaul for companies that want to enable world-class decision-making.

- **Reporting Processes**

Today, one of the most typical corporate performance meetings is the month-end financial review, where finance and accounting managers present the monthly and year-to-date numbers. This is typically done by handing out financial statements to each executive in the meeting as well as presenting the same in Excel or PowerPoint on the screen and in some cases also by displaying charts to review trends and comparisons. Often, much of the meeting is spent presenting the financials, with little time to dig into the key metrics that stand out because of major variances. In the future, CFOs and controllers will be able to perform their entire presentation online from within the BI suite. Because the presentations will be online and organized in a storyboard fashion, it will be easy to follow and, when questions are asked, the presenter will, without delay, be able to instantly drill down to detailed transactions or supporting reports and dashboards to provide answers.

Companies will also reengineer the review process itself so that executives can log into the BI portal prior to the meeting, review the financials and enter questions and comments directly

into the system to be stored with the metrics for later review and for historical analysis. Because BI systems in the coming years will automatically alert managers to exceptions and significant variances, there will be no surprises in the monthly review meeting, and instead, the presenter as well as the executives in the meeting can focus their time on the metrics that matter the most and where variances indicate that there are issues or opportunities (see exception report examples in Chapter 5).

The ongoing reporting and analysis that BI solutions will enable for department heads and any other information worker is just as important as efficient, highly focused month-end and quarterly performance meetings with executives. Apart from e-mail alerts when thresholds are reached or major exceptions occur, users will be able to log into the BI portal at any time for ad-hoc reporting and analysis related to their specific areas of responsibilities. Because your BI solution will live on top of a well-organized data warehouse, these users will be looking at numbers that are agreed upon by the corporate team, so there is always “one version of the truth,” and discussions and decisions can be based on the same facts.

Another aspect of future reporting processes and the reporting capabilities of BI solutions will be benchmarking. In other words, the BI suites will allow for easy upload of industry averages or external data from public companies in the same industry. This will allow managers to analyze benchmark reports so that decision-makers not only look inward at the company’s own performance but they also compare it with external competitors or industry data. Today, many companies don’t do regular benchmarking because preparing the information is a manual and time-consuming process. This can result in delayed and less than optimal decision-making, because managers might be thinking everything is fine because results are on par or above budget, but if all the competitors are growing twice as fast, that can become a big problem at a later point, and regular benchmarking helps keep an eye on this.

Analysis in the Future

So far in this chapter we have focused on more formal planning and reporting processes, including exception reporting. A company’s decision-making capabilities are also dependent on easy and clear analysis of trends as well as ranking and comparisons. These are some of the core features of today’s dashboard tools. However, the problem is that most dashboard tools are stand-alone software or cloud services that use their own databases or in-memory data stores, have their own user interfaces and logins, and so on, and this hinders fluent, easy end-user movement between planning, reporting and analysis. In the BI suites of the future, all of these features will be included in the same offering and completely integrated with the same interface in a single web

portal, looking at the same data store and so on. When data is being uploaded to the underlying data warehouse, users enter data as part of the budget or month-end consolidation process, etc., it is instantly available in dashboards and reports as well because it is all part of the same, fully integrated BI Suite.

Highly functional dashboards and analysis features will include all the typical chart types, with full drilling and filtering options, including easily taking the user from, for example, a revenue trend analysis to a forecast input screen to adjust the outlook for that revenue stream and then to a financial report, where this new scenario can instantly replace an old budget column to show the adjusted actual to forecast variances. Today, very few organizations are able to smoothly do the above three steps without moving from tool to tool and exporting and importing data multiple times, likely with the aid of Excel spreadsheets along the way.

Is the future a cloud-only world?

In the recent years, cloud services have rapidly gained in popularity. An increasing number of organizations now choose to implement their accounting system, customer relationship management (CRM), BI, web-site analytics and more using vendors' cloud offerings (for more information about the cloud, see Chapter 7). Still for years ahead, many companies will keep some of their data sources on-premise as well, and even if they one day have moved every single business application to the cloud, their data will be spread across many vendor clouds. In other words, as described earlier in this chapter, the BI suite's underlying data warehouse and its integration capabilities will be key to enable world-class decision-making in your company because it will bring all your key data together in one place, whether this is on-premise or in the cloud.

Now, with the rapid growth of cloud offerings, there are other exciting services being offered by the largest cloud providers, and these include services for machine learning, deep learning, big data and more. The cloud-based BI suites of the future will increasingly make it easy for users to take advantage of these services even if they are not a native part of the BI solution itself because the cloud platform provider offers them provide easy ways to connect the services to your data warehouse. The result is an array of extended BI functionality that can offer advanced analysis of otherwise hard-to-find relationships in your data that ordinary reports and dashboards may not catch, and that can be used for automated forecasts or to discover new opportunities. Today, only the largest companies out there take full advantage of such features because they have dedicated data scientists and highly technical developers. In the future, BI suites will offer very easy, low-cost integrations with external specialty web services so that an ordinary business user can take advantage of this functionality to drive world-class decision-making.

Preparing to take maximum advantage of the BI suites of the future

As exciting as technologies can be when users truly see how they can automate previously manual tasks and free up time for better analysis as well as offer insights that otherwise would be close to impossible without computer assistance, none of this will provide the same huge advantages unless your data is good. We also discussed this in the beginning of this chapter and now that we have discussed a number of the ways future BI suites will improve your decision-making, it is time to revisit the data issue because it can take years to get good data, and it is critical for success. Sometimes a transaction system, like an ERP system, is simply not capable of capturing the information required for later detailed, high-quality analysis, and it requires a replacement of the system itself. But, just as often, it is a process issue where users are simply not capturing accurate or detailed information when they enter data into the business application. Either way, the sooner your team understands and accepts and is motivated to prepare your organization for a future BI suite implementation, the sooner they can start improving the processes and systems that are going to provide quality data to the BI system.

Some of the processes and issues you may need to work on are:

- Getting executive and key personnel buy-in for BI and BI system process improvement.
- Hiring (if needed) the required personnel to manage the system and the project.
- Updating internal transaction systems (such as your ERP system) that will be generating the highest quality transactions upon which to base decisions in the future.
- Designing internal top-down and bottom-up planning and decision-making processes.
- Integrating strategic planning, forecasting, budgeting and reporting processes.
- Defining the most important key performance indicators (KPIs) for each business unit, upon which to measure both the performance of the business and to hold employees accountable.
- Create/refine a cloud strategy (roadmap for the systems to deploy in the cloud).

Executive Summary

Even if the future is not here today, you can do much to prepare for it because most of the required time and work lies in getting clean data in your systems of record and organizing and connecting planning, reporting and analysis processes. In most companies, this can take several years, and in the meantime, modern BI suites will advance rapidly and deliver what is needed from a technology side to simplify and automate so you can enable world-class decision-making in your organization. Should some or many of your data sources and processes be ready today, then most BI suites allow for modular implementation so you can start, e.g., with your data warehouse,

then the reporting, then tackle budgeting and forecasting and so on, eventually ending up with a complete BI implementation and great information available to any user, anywhere, at any time.

Readiness checklist

Item	Your Score (1 lowest – 10 best)	Your Notes
Transaction systems in place to provide the data needed		
Data in data sources “clean” and ready for loading (remember: garbage in- garbage out)		
Cloud policy in place to guide future decisions about cloud or on premise solutions		
Total Score		

Chapter 3

Enabling World Class Decision-Making for Government

Purpose

In the previous chapters, we have discussed using BI technology as an enabler to achieving world-class decision making. The purpose of this chapter is to show some of the ways a decision support platform could be used to enable world-class decision-making across all levels and areas of government, whether Local, State, or Federal. With increased funding pressure, the ability to have quick access to reliable data for decision-making is crucial. Governments are facing increasing calls to do more with less. Uncertain revenue streams, unknown costs, shifting priorities, and emergencies all play a role in making world-class decisions more difficult and yet more crucial than ever. This chapter applies to Districts, Authorities, and any other indirect governmental organization as well. You can use some of these examples or replace them with challenges unique to your organization.

The tables that follow contain a small sample of common business problems faced by governments and show with the right information that is readily accessible and reliable; the outcomes can be world-class decisions. Most people think of financial data and decisions when thinking of Corporate Performance Management, Business Intelligence, and other similar decision support sub-industries. However, the benefits of moving to these platforms go far beyond financial and can be used to impact operational and policy decisions as well. The tables included in this chapter show how the entire organization can benefit, which is why we broke them into distinct service areas. These tables are some of many examples and should be used as guidance for creating tables that best meet your needs.

Executives (Elected/Appointed)

What this table includes.....

Decision Making Enablers BI Platform			
Business Problem	Input	Output	Outcome – World Class Decision
Are we meeting the expectations of our citizens?	Data from citizen surveys, town hall meetings, correspondence, etc.	Ranking against expectation and benchmarking.	Whether to stay the course, make minor adjustments, or wholesale changes.
How do we meet the needs of our citizens in our neglected areas?	Annual spend per service group per community, data from the communities on needs and wants.	Actual results vs. expected results, areas of underspend, overspend, ranked list of priorities.	Whether to increase funding or services. Which priorities to address based on available funding.
How do we provide for the increased services required to support population growth?	Historic spend, anticipated future spend, population growth, service needs.	Additional revenue from other sources, tax increases, fees, spending reallocation, public-private partnership service delivery.	Which spending stream to approve and what level of service to provide, and how.
How do we balance revenue and expenditures with good public policy?	Historic and projected spend across government. Policy, program, initiative revenue, expenditures, and performance.	Spend and performance per Policy.	Where to align government financial performance with policy.

Finance Department

Decision Making Enablers BI Platform			
Business Problem	Input	Output	Outcome – World Class Decision
How do we plan future spending levels to account for our underfunded pension plan?	Employee count by years of service, position, pay, estimated number of retirees over the next X years, current level of funding, estimated return in the market.	Anticipated pay out annually over the next X years, expected level of pension fund interest, investment increase. Changes to pension plan for new employees.	Whether to contribute additional funds, find additional funding mechanisms, modify pension plan, or cut costs.
How do we incorporate into our existing reporting the increased reporting requirements from the various levels of government?	Data supporting reporting requirements from multiple entities in multiple systems.	Report creation and report package creation from one source or combining data from multiple sources in separate reports.	Move to one central source for meeting reporting requirements, through a CPM product, or reduce the number of output generators.
How do we fund capital projects with uncertainty in the bond market and the Fed?	Current number of projects, annual spend annual revenue, projected revenue and spend, spending categories, funding sources.	Projects by funding source and level vs. anticipated expenditures and expected borrowing ability.	Whether to rely on the bond market for funding or seek alternate methods of financing, also prioritizing projects.
How do we find new sources of revenue or maximize our existing sources?	Historical and current sources of revenue, taxes, fees, intergovernmental transfers, grants, etc. Historical and current expenditures tied to each type and source.	Total funding by type and source. Expected continuation of source and funding level. Expected expenditures by type and source.	How to best balance revenue types, sources, and amounts from each to balance expected expenditures.

Budget Department

Decision Making information Enablers BI Platform			
Business Problem	Input	Output	Outcome – World Class Decision
What do we do if a Revenue source is reduced or eliminated?	Existing funding sources, projected funding levels, funding needs for both short and long term.	Various ‘What if’ scenarios. Identification of additional funding sources.	Securing existing funding and establishing which sources of new funding to secure. Analyze the What If scenarios.
How do we budget for future years while making adjustments to match the reality of the current year?	Expected policy changes, expected action by other governmental entities, economic forecasts, demographic forecasts.	Out years projections, ‘What if’ scenarios.	Balancing current and future funding.
How do we project future projects that may not be funded or have funding reduced by future administrations?	Current projects, mandatory future projects, desired future projects. Personnel, supplies, services, and capital requirements.	Options and prioritization of projects across the Organization. Scoring algorithm to rank projects.	Which projects to fund and when.
How do we use our historical budget to historical actual numbers, along with the variances to better project future budgets based on current and unknown needs?	Historic budget to actual, historic level of budget revision, historical KPIs tied to budget and actual. Variance analysis, and alerts on variances.	Description of the budget to actual variances existed and the required level of budget amendments.	How to better budget to meet actual spend.

Public Works – Water/Sewer Department

Decision Making Enablers BI Platform			
Business Problem	Input	Output	Outcome – World Class Decision
How do we replace our aging sewer infrastructure and how do we determine priority?	Current and projected funding sources and levels. Actual historical spend. Projected input costs. Grading of current sewer infrastructure. Demographic trend analysis. Future population growth.	Realistic replacement projections and timelines given various cost and revenue scenarios overlaid on needs and gradation of existing sewer infrastructure.	The priority and schedule of infrastructure replacement.
Our wastewater treatment plant is due for a major overhaul, how do we fund it, and under what schedule?	Current level of maintenance expenditure, estimated lifespan, future replacement costs based on various timelines. Funding sources.	Schedule of likely overhaul options. Alternate options.	Whether to replace and when, or adopt alternate option(s).
How do we ensure we have an adequate water supply during the dry season?	Analysis of current and historic water levels and sources. Usage levels, historic, current future projected.	Alternate sources of water, conservation options, intragovernmental options.	Making policy choices on water supply, and usage.
How do we fund infrastructure in new developments?	Historic funding sources based on developments, projected needs.	Funding per development, funding governmental, private, and partnerships.	Which funding options to apply to which developments and timelines.

Transportation – Roads/Traffic Department

Decision Making Enablers BI Platform			
Business Problem	Input	Output	Outcome – World Class Decision
How do we delay having to resurface roads? Are there areas of immediate need or new safety standards?	Miles and age of roads responsible for maintaining, maintenance tickets and cost per segment, resurface cost, funding sources.	History per segment, projected cost for repair vs. resurface. Projected usage per segment. Determine Federal, State, Local funding.	Whether to repair or resurface and on what schedule.
What schedule do we use for our signage replacement program?	Costs associated with replacement. Sign inventory. Demographic projections.	Signs needing replacement, anticipate life span. Alternative sources.	How and when to replace signs to improve traffic flow and reduce accidents.
How do we alleviate congestion on our clogged arteries?	Traffic count per segment. Maintenance costs and activity per segment. Demographic statistics for the area.	Projected traffic count per segment, estimated life span per segment, funding sources. Alternate travel options such as automated vehicles, mass transit, etc.	Whether to build additional capacity or shift to alternatives.
How do we reduce crashes at our highest incident intersections?	Traffic count per intersection. Accident history and causes. Demographic statistics for included intersections. Signage and lighting per intersection.	Options for safety improvements at each intersection. Redesign options. Costs and funding sources.	Which intersections to prioritize and with what option.

Fire Rescue Department

Decision Making Enablers BI Platform			
Business Problem	Input	Output	Outcome – World Class Decision
How do we lower our response times in certain areas and certain emergency situations?	Historic response time, type of call, demographic factors, level of training, age of equipment, coverage area.	Options to adjust coverage areas. Enter into agreements with other agencies, training or equipment improvement options.	Which options to adopt and on what timeline.
Should we continue staffing our own EMT or outsource that function?	Historic cost inputs, projected costs, demographic trends, employee retention.	Alternative providers and associated cost, level of service projections.	Whether to keep in house, outsource part or all.
How do we modernize our equipment with limited funding?	Maintenance history, purchase history, expected lifespan, funding sources.	New funding sources, bonds, fees, leasing, tax increase, etc. Options to reallocate to increase lifespan. Changes to maintenance and/or equipment provider(s).	How best to fund the modernization of our equipment.
How do we equip our responders properly given the traditional duties of the job versus new challenges?	Historic calls year over year, current calls, and data from Federal Agencies, CDC, DOJ, Police, Sheriff, etc. Demographic trends and projections by neighborhood.	Trend analysis of how the duties and needs have changed and are changing. Projection of future duties given what if scenarios.	Policies to adopt that best enable our responders to meet the changing needs of the citizens.
How do we prepare and handle large scale emergencies?	Types of emergencies, resources, time allocation, and expenditures.	Analysis of training plans, communication methods, coordination of providers.	Detailed emergency management plans.

Police/Sheriff Department

Decision Making Enablers BI Platform			
Business Problem	Input	Output	Outcome – World Class Decision
Is our bike patrol achieving the results we expected?	Number of officers assigned and associated costs, shifts covered, stops, citations, arrests, citizen survey results, and feedback from leaders. Crime statistics in covered area.	ROI for investment in relation to monetary, safety, and community good will. Options for adjustment of the program.	Whether to keep the program in place, adjust, or drop.
What level of patrol coverage should we provide in certain areas?	Crime statistics per neighborhood, demographics (historical, current, projected). Level of historic and current patrol coverage. Survey results from comparable districts.	Results of historic coverage on crime statistics. Projected future coverage needs based on anticipated trends and community feedback.	The optimal level of coverage per area and associated funding sources.
Is the inter-local agreement to patrol the interstates across multiple jurisdictions working and cost effective?	Cost with the agreements in place, cost before and after (for those that have expired), opportunity cost. Revenue vs. Expenditures. Citizen survey results, accidents, incidents, citations, and arrests.	ROI – monetary, safety, citizen satisfaction.	Retain the agreements, renegotiate, cut, or obtain other alternatives.
Which jail services, if any, does it make sense to consider outsourcing in order to reduce cost per inmate or improve inmate services?	Current services provided, associated costs, revenue streams. Demographic statistics – historic, current, and projected. Watchdog groups feedback.	Options for providing services, expected service quality. ROI.	Do we outsource any services, if so to whom?

Parks/Recreation Department

Decision Making Enablers BI Platform			
Business Problem	Input	Output	Outcome – World Class Decision
How do we pay to incorporate technology into our programs that citizens are expecting?	Current level of funding on technology, and uses of the funding. Number of impacted programs today or in the future. Number of citizens served historically, currently, projected.	Level of technology spending required compared to employee costs. Type of technology required. Options for acquisition. Estimated ROI in terms of increased revenue and customer satisfaction.	Which programs to increase technology spend and can it positively impact employee costs. Communication plan to the programs customers.
How do we decide which parks should have increased or reduced facilities?	Inventory of parks facilities, historic, current, projected usage, maintenance and capital costs per facility. Demographic trends. Customer feedback.	Identification of options for each facility on whether to increase or reduce facilities. Options for re-purpose, sale, partnerships with other organizations.	What our park facilities will look like for the next 5-10-20 years, and having plans in place for those decisions.
Is our park maintenance program working?	Costs of maintenance for each park, citizen feedback, comparable spend and results from other districts surveyed.	Maintenance options by park, level of service (minimal and desired), alternate funding sources.	The optimal level of maintenance per park based on available funding and desired level of service from the citizens.
How do we add parks in our growing areas and balance against underutilized parks?	Park inventory, usage numbers, programs per park, participants, community feedback, total cost per park (broken down by expenditure category), and revenue per park. Demographic trends.	Analysis of park utilization current and projected. Project costs and ROI per park. Future best use options for each park. Land swap or sale opportunities to fund other parks.	Where and when to build new parks, funding options, and where, or if, to re-purpose existing parks.

Environmental Protection

Decision Making Enablers BI Platform			
Business Problem	Input	Output	Outcome – World Class Decision
How do we balance growth with protecting the environment?	Historic level of growth to environmental protection expenditure and results. Projected growth based on demographic trends, estimated impact on the environment.	Types of protection needed, methods of growth. Identification of responsible parties and impacted parties.	How best to balance growth with environmental protection and how best to communicate to stakeholders.
Is our permitting program working?	Number of permits issued, cost per permit, revenue per permit, enforcement actions, mitigation results. Survey results from citizens, NGO, and other impacted governments.	ROI for type of permit. Citizen and watchdog group recommendations. Other governmental entity recommendations.	Whether to restructure permitting and how.
Can we mitigate flooding with additional retention areas and not negatively affect the environment?	Flood modeling historic, current, and future. Damage experience and projections. Cost of adding retention areas per impacted zone. Estimated impact on the environment.	Flood reduction opportunities. Impact studies. Cost drivers, revenue sources.	Whether, and where, additional retention areas can be added for each geographic area.
How do we best allocate our Brownfield funding?	Current and projected Brownfield redevelopment, mitigation needs. Current and projected costs and funding levels.	Options by site, and alternate means for development or mitigation. New sources of funding and partnerships.	The optimal funding level per Brownfield site.

Other Central/Shared Services – IT/HR/Purchasing/Risk Management/Legal

Decision Making Enablers BI Platform			
Business Problem	Input	Output	Outcome – World Class Decision
Do we provide the optimal level of service to our Departments?	Number and type of support tickets, resolution time, costs, and customer satisfaction survey results. Number and type of applications, hardware, and infrastructure maintained or provided.	ROI, customer expectations vs. actual results. Alternate service delivery methods such as outsourcing.	How to optimize IT service delivery.
How do we replace our aging workforce as they retire?	Demographic trends for the workforce, and for the community. Recruitment efforts and experience. Recruitment, employment, and retirement costs. Compensation survey results for comparable organization public and private.	Outreach program identification, mentoring or intern opportunities, alternate compensation packages. Alternates to replacement.	The optimal level of employment and policies best designed to replace experienced people.
How can we reduce the transaction level and cost of our Purchase Orders?	Number and type of POs issued historic and current. Cost per type of PO. Level of effort per PO. Methods used to issue and track POs. Benchmarks against other organizations.	Alternate PO delivery methods. Policy change recommendations.	What steps to take to increase the efficiency of issuing POs and reducing the associated costs.
How do we reduce our Workers Compensation and health benefits annual spend?	Annual workers comp costs, including time lost. Reasons for claims. Employee suggestions. Benchmarks against other comparable organizations. Historic health benefits, claims, costs, service options.	Various methods to improve safety in the workplace. Options to improve overall health and wellness of the workforce. Cost reduction options from providers.	Which policies to change and how to reduce costs of workers comp and improve quality of life for employees.

Solid Waste Department

Decision Making Enablers BI Platform			
Business Problem	Input	Output	Outcome – World Class Decision
Are we providing good, cost effective, and optimal trash service?	Costs for labor, equipment, materials and supplies, overhead, etc. per route per unit. Traffic route analysis for time by unit numbers. Customer satisfaction survey results. Tipping, disposal, container costs and revenue. Demographic trends.	Efficiency and effectiveness measures by route. Cost reduction options, revenue increase options. Opportunity costs of increasing service and impact on customer satisfaction. Alternative delivery methods.	Whether to increase or reduce trash service, by how much and where.
How do we extend the life of our landfill(s)?	Tonnage per acre, expected lifespan, types of refuse, sources of refuse.	Alternative disposal methods and providers. Waste reduction options, recycling options.	Whether to increase the life of the landfill(s) or move to an alternate disposal method(s).
Is our recycling program effective?	Households and businesses participating. Cost of pickup and disposal, Revenue generated Impact on landfill(s). Potential new customers vs. customers who may dropout.	Options for improving the effectiveness of the program or shifting to another program.	Whether to expand, shift, reduce the recycling program.
Should we outsource some hauling routes?	Total costs per ton for services provided in-house. Bids from private and other public haulers.	Analysis of in-house vs. private or other public providers by route.	Whether to outsource any routes and if so, to which provider.

Social Services

Decision Making Enablers BI Platform			
Business Problem	Input	Output	Outcome – World Class Decision
Are we reaching the number of citizens who most need our help?	Citizens served by program, program results, citizen feedback survey results, cost per program, funding per program, other providers (competing or complementing)	Comprehensive analysis per program. ROI by program. Alternatives to directly providing the program. Recommendations by program for increase, decrease, or elimination.	Whether to increase (or cut) programs to citizens and how best to fund the programs.
How do we increase our service level to match our increasing elderly population?	Historic and current service level, demographic trends, customer survey results. Elderly trend study results.	Level of effort required to meet the needs of the elderly. Funding sources, delivery options. Delivery providers.	How optimally to meet the needs of the elderly.
Should we collaborate with the School system to provide low-income children services?	Programs provided directly. Cost per program, numbers served, quantitative and qualitative results. Programs provided by school system(s).	Directly provided programs overlaid on School provided programs, needs analysis, gap analysis. Funding required, funding sources. Alternate providers.	How to work with the School system to close gaps, avoid program overlap or redundancy, and serve more of the low-income children.
Are we maximizing our Grant revenue?	Historic and current level of Grant funding and types of funding. Projected level of funding. Success rate of applications. Identified need. Supplemental spending by Grant. Needs met by Grant, and results.	Identification of areas of service that could be improved by available Grants. Resource needs to raise the application success rate. Alternatives to supplemental Grant spending.	How best to receive and maximize Grant funding.

Executive Summary

As we have shown there are multiple challenges faced by governments every day and the decision makers require quick and reliable information. By having that information and understanding how to use it correctly, employees can begin to make world-class decisions. The way to do this is by utilizing a comprehensive BI platform across the organization, which can help the organization meet its mission in an optimal manner. In the chapters that follow, you will see in detail how to put these concepts into practice by selecting and using a BI platform.

Chapter 4

Assessing Your Organization's Decision-Making Ability Score

“There is no substitute for accurate knowledge. Know yourself, know your business, know your men.”

Lee Iacocca

“It is hard to plan where you want to go in the future if you don't know where you are today.”

Nils Rasmussen.

The purpose of this chapter is to help you assess the decision-making capabilities of your organization *today* versus those of a best-in-class business. By pinpointing the current ability of your information workers today to make optimal decisions and measuring these against an ideal state, it is easier to establish *where* you should be looking for improvement opportunities and then document these in your master plan to achieve world-class decision-making across your organization. As you go through the self-assessment for your organization, it should become quite clear (if it was not already) that people and processes are just as important as technology when it comes to establishing the right foundation for world-class decision-making.

It is a well-known fact that every organization needs to get to know its strengths and weaknesses to evaluate its capabilities and potential. Usually this is done in conjunction with your organizational strategy documents and by using a popular matrix format referred to as a SWOT (strengths, weaknesses, opportunities and threats) analysis. However, because the purpose of this book is to help enable world-class decision-making through the use of modern BI technology, we are using a custom self-assessment format to help you determine the current status of decision-making capabilities in your organization.

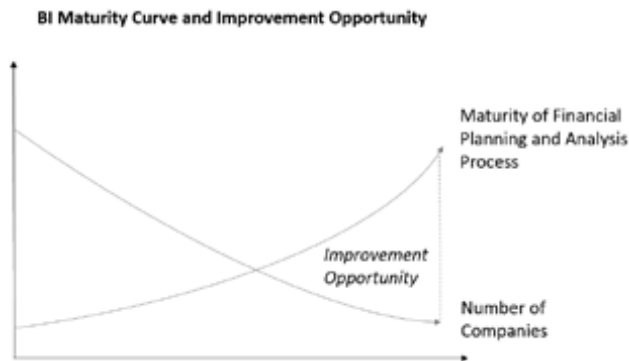
You will find two tables below. The first one lists questions for each readiness area to help your thought process and insight when filling out the second table with answers for your own organization.

Readiness Area	Readiness Conversation Starters
Vision	<ul style="list-style-type: none"> • Do we have a vision of how the organization will operate with everyone having full, online access to a centralized BI solution? • Are we able to see and verbalize the benefits of a BI solution to internal decision-makers and key users?
Executive Support	<ul style="list-style-type: none"> • Do we have, or will we be able to get, executive support for the purchase and implementation of a BI solution? • Any major obstacles (such as other top priorities, change in management or upcoming mergers/acquisitions) to a BI project?
Infrastructure	<ul style="list-style-type: none"> • Do we have the hardware/platform infrastructure to support a BI project? • Or...are we better off implementing a cloud-based BI solution?
Availability of Data	<ul style="list-style-type: none"> • Do we have clean (or clean enough) data sources to feed to the BI solution? • Are our current data sources open/accessible so data can be extracted? • Do any critical source systems need to be in place prior to a BI solution?
Resources/Power Users	<ul style="list-style-type: none"> • Do we have capable internal resources to implement and maintain the BI solution? • If not...do we need to hire resources prior to the BI implementation? • Are there any internal politics do deal with (such as “I don’t want to learn another system”)?
Funding Available	<ul style="list-style-type: none"> • Do we have, or can we get, the required funding? • Should we purchase or rent (SaaS – software as a service) the BI solution?
Business Requirements Documented	<ul style="list-style-type: none"> • Do we have a structured business requirements document (BRD) that clearly lists and explains our requirements, both to assure internal agreement as well as to optimize communication with BI vendors? • If not...who will write it (internal resource or consultant)?
BI Solution Selection	<ul style="list-style-type: none"> • Who will create a short list of BI solutions to evaluate? • Who will be on the internal selection committee? • Have we documented how we are going to conduct the evaluation process? • When is the best time to conduct the evaluation process?
Partner Selection	<ul style="list-style-type: none"> • Do we need outside assistance to conduct the evaluation? • Can we save time/money by finding, e.g., a local implementation partner? • Who are the most skilled partners/consultants we can work with?

Based on the above questions, you can now fill out the table below with your input. Fictitious answers have been entered in the three columns to the right to provide an example.

Readiness Area	Urgency (Low/Mid/High)	Preparedness (Low/Mid/High)	Status (Note: The comments below are examples)
Vision		High	Completed Business Requirement doc with 5 year vision.
Executive Support		Mid	CFO is sponsor.
Infrastructure	Low	High	Not needed. Will implement cloud solution.
Availability of Data	High	Mid	ERP and Payroll vendors have confirmed data export format/API. Data is clean.
Resources/Power Users	Mid	Mid	Hire BI analyst prior to implementation.
Funding Available	High	Mid	Waiting for board approval.
Business Requirements Documented	Mid	Low	Will be one of the first tasks for the new analyst we will hire.
BI Solution Selection	Mid	Mid	Have seen 1 st round of demos and narrowed down to 2 solutions
Partner Selection	Low	High	Have list of certified partners to select from.

As the figure below indicates, few companies have both mature financial planning and analysis processes and a strong, unified BI platform, and this presents a significant improvement opportunity for organizations that want to drive their performance by using modern BI that helps enable employees to make world-class decisions.



In the table below, on the left you can see the typical situation of a company. On the right reflects what an ideal state may look like. The vast majority of organizations find themselves in the “Typical Situation” table, as they have added different systems over time, and often without looking at the bigger need of the organization to centralize key data and use fewer, more integrated and easier business intelligence tools. The result is sub-optimized decision-making, frustration, higher cost, more training requirements, and so on.

Typical Situation		Ideal Situation	
Technology	Result	Technology	Result
Many reporting tools to get information out of ERP and other systems	Wasted time, higher cost, expert dependency	Single BI Suite (reporting, budgeting, dashboard, data warehouse)	High ROI, faster/better decisions
Proprietary reporting tools that lack familiarity and flexibility	Expert dependency, manual Excel dumps, longer learning time	Excel report design (with web/mobile/e-mail distribution options)	Puts business users in charge, time/cost savings
Key data is stored in different systems (ERP, CRM, etc.)	No or less information available when needed, manual compilation, longer decision-making times, poor decisions	Use a Data Warehouse to compile information to a single location	Time/cost savings, faster/better decisions
No easy access in a single application and from anywhere, anytime	Poor decision-making, wasted time looking for data	Single, web-based BI portal to provide end-users with secure, self-service access	Time/cost savings, faster/better decisions

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The “ideal situation” table on the right in the figure above shows an example of integrated BI technologies that, when carefully selected based on proper needs analysis and successfully implemented, can result in numerous benefits and ultimately act like a single solution that enables world-class decision-making across the organization. In other words, the two aforementioned tables serve as an illustration of typical, core BI technologies managed in an uncoordinated, non-strategic fashion and with the resulting lack of benefits versus a highly planned, strategic implementation of a BI platform with examples of major advantages achieved.

Executive Summary

As you read this book and consult with your own leadership team about the potential benefits to your organization when it comes to deploying a modern BI solution for reporting, planning and analysis, the previous chapters, this chapter, as well as the answers you have provided in the two tables above should provide you with a high-level understanding of what BI solutions offer and how your organization can benefit to help enable world-class decision-making for all your information workers. In the following chapters, we will start discussing the planning, reporting and analysis processes as well as examples of what such models and a related implementation could look like.

Readiness checklist

Item	Your Score (1 lowest – 10 best)	Your Notes
Self-assessment document prepared/tailored to your organization		
Self-assessment document distributed to key assessors		
Self-assessment document completed		
Management meeting to discuss result of self-assessment		
Management team conclusion and action items		
Total Score		

Chapter 5

Creating a Closed-Loop Planning, Reporting and Analysis Process

“The secret of getting ahead is getting started. The secret of getting started is breaking your complex overwhelming tasks into small manageable tasks, and then starting on the first one.”

– Mark Twain

Every organization has many tasks and processes, but a key question to ask the team is whether there is a purpose for them and if it has an impact on the decisions being made in the organization. At the same time, can managers make the correct decisions with the information being provided, and are they capable of knowing when a decision is important? As an example, one response that should never be stated is, “We don’t know why we do this process, but we have performed it this way for years.” Processes like that must be challenged for organizations to continually improve and impact decision-making. This section will concentrate on improving these tasks and processes and ensuring that the strategy is aligned with the reporting, planning, and analysis. Closing the loop refers to tying these processes together.

This chapter will concentrate on the chart below, which shows that an organization should always strategize, which leads to planning, and then an analysis of the data, which may lead to operation changes. The operation changes may then lead to strategy changes, and the process continues. There are sections later in the book that will concentrate on specific examples, but this chapter concentrates on the best practices of strategy, planning, and analysis.



Planning, which encompasses budgeting and forecasting, articulates the values used to evaluate growth as well as how capital, both people and money, will be distributed across the organization. The development of the budget and forecast will be more effective when it is connected to the overall strategy. Connecting the strategy and planning enables employees to comprehend the strategic objectives and targets, which will ensure that their decisions take the strategy into account. The communication of the strategy must be consistent and ongoing. The comprehension of the strategy leads to better performance across the organization, as the employees will allocate resources to match and surpass the goals and objectives of the organization.

Setting Strategy

Harvard Business Review research reveals that, on average, 95% of a company's employees are unaware of, or do not understand, its strategy, and 85% of executive teams spend less than one hour each month discussing strategy¹. These numbers should scare all executives into working to improve these numbers internally. If the employees are closest to customers, vendors, and partners and in charge of daily decisions, then how can they be effective if the majority of them don't know the strategy? Also, how can any improvements be made in the strategy if executives are spending less than 5% of their time developing and improving the strategy? It is just not effective and it will impact revenue and profitability without changes. One other statistic: less than 10% of strategies effectively formulated are effectively executed.²

Setting strategy is not only integral; it is a mandatory criteria of any successful business. But the steps to implement the strategy and track the success of the strategy are just as important. An executive can create a strategy that will increase revenue and profitability by 20%, but it is futile if it is not communicated or executed properly. The first step is communication, and below are simple steps to improve it across the organization:

- ✓ **Change it Up:** confirm that the message to employees can be understood and acted upon by every employee. Ask questions, have fun games, and continually discuss it during meetings and company presentations. Try to find creative ways to communicate the strategy rather than a consistent way.
- ✓ **Narratives:** use stories and examples, from employees and managers, to emphasize the strategy and how it is working.

¹ <http://www.hbs.edu/faculty/Publication%20Files/05-071.pdf>

² <http://wunderlin.com/effectively-execute-your-strategic-plan/#.WDth17IrK00>

- ✓ **Inspire, Educate, and Highlight:** motivate employees by showing successes across the organization. Get quotes from customers, vendors and partners and demonstrate how the company is doing versus its goals.
- ✓ **Deliver in Many Ways:** executives, managers, and employees should help communicate the strategy to everyone. If employees regularly converse about it with other employees, then there is ultimately success.
- ✓ **Think Outside the Box:** employees have many different ways to communicate, so it is important to try many different ways, such as using social media, blogging, and one-on-one conversations.
- ✓ **Invest:** if initiatives and strategy could be implemented more successfully and efficiently by investing money, then most companies would do it immediately. So determine what the cost and payback is and then move forward.

The strategy and the plan must be completed prior to setting a budget or forecast and before analyzing the financials. Below are some steps to ensure that the strategy is finalized:

- ✓ **Visualize:** document it in ways that will be visual to employees rather than simply writing it out.
- ✓ **Communicate:** see above for the details.
- ✓ **Limit the Initiatives:** if there are too many strategic initiatives, then none of them will be completed; therefore, only have two to three initiatives and then multiple tasks to support them.
- ✓ **Assignment:** one person should be assigned who is ultimately responsible for each initiative.
- ✓ **Manage:** the initiatives need to be managed, which includes documenting the tasks, creating a timeline, assigning resources, and monitoring the success. Meet weekly or bimonthly to review the initiatives and ask the following three questions: 1) “Were the promises made at the last meeting met?” 2) “What will happen prior to the next meeting?” and 3) “Are there any impediments or risks to completing the initiatives?”
- ✓ **Set Goals:** the goals should be aligned with the strategic plan and should be measurable and achievable. If goals are not measurable, then consider changes to the operational or financial structure to accommodate the need. As an example, if there is a specific KPI in the company’s industry and it is not possible to track, then look into ways to make this happen. Without a way to track and measure goals, then there is no way to know what success is and whether the company achieved its goals.
- ✓ **Rewards:** there should be rewards for the employees that complete initiatives that drive profitability and revenue growth.
- ✓ **Decisions:** it is important that decisions are being made, but if a decision is not correct, then the management team works to fix it. Decisions are made with the best information at the time, but no one should be stubborn about changing up an incorrect decision. Do not hope that it will change if all of the information is stating that the direction is not correct.

Planning

Planning consists of creating both an annual budget and forecasts. A forecast can include a rolling-forecast, five-year forecast, monthly forecast, and a quarterly forecast. The process to put together a budget or forecast can be very complex and time-consuming for organizations, but this section will discuss the best practices of the planning process and how it relates to strategy.

For budgeting, a good practice is to create a top-down and a bottom-up budget. The top-down budget should be set as part of the strategy session and is an efficient practice to determine if the strategies will be successful. This involves more general increases and decreases, but it would be aligned with the strategy of the company. The bottom-up budget would be determined by the employees after the strategy has been communicated and finalized with the management team and employees involved in the budgeting process. If there is a substantial difference at the end of the two processes, then it must be analyzed to determine the differences.

The difficulty is aligning the strategy to the planning process. Many discussions about investments and budget reductions must take place prior to the planning process. For example, it may not be possible to cut departmental costs by 20% without having any loss in production. Therefore, it is imperative that any decisions on investments, hiring, and financing are finalized and documented prior to the start of the planning process.

There may be times when a strategy has been set but a manager provides good reasons why the strategy may not work or why the goal is impossible to reach. Meet with the employee and discuss the issues and determine a fair common ground. It is essential that everyone is on board with the strategies and that the goals set are fair and achievable.

Below are practices that should be followed to ensure an efficient process:

- ✓ **Software:** most companies still use native Excel for their planning, but it is difficult to consolidate, prone to errors, contains links that are hard to maintain, and overall can be very time consuming. Purchase planning software that can ensure more efficient tools, fewer errors, less manual work, and better accessibility. Planning software also allows version control, the ability to consolidate, template control, security, and improved reporting and analysis. An Excel add-in product may be the best solution for administrators, as they already have Excel skills and then use a web portal for the end-users to enter their data.
- ✓ **Standardize:** use standardized and secure templates across the organization. Employees should not be able to modify the templates themselves, and the templates should be used across multiple departments rather than each department needing a specific template.

- ✓ **Workflow:** have a practical workflow and timeline that allows management to review status in real-time and reinforce the approval process.
- ✓ **Timeline:** determine the timeline, document it in detail and communicate it to all parties involved. The timeline should include when the budget administrators start the budget, through approval, and finally consolidation of the budget.
- ✓ **Lock Down:** once the budget is complete, then it should be locked down.

Reporting and Analysis

There is an old saying that states, “If you can measure it, then you can manage it.” As stated above, it is imperative that the data needed to analyze the strategy is available. If not, then the strategy can not be managed, as there will be no ability to report on it or analyze it.

Reporting and analysis should concentrate on the areas of the organization that impact revenue and costs. Every organization has a handful of reports, but do the reports have value for the management in order to impact the decisions that are made? Most organizations may be able to eliminate many reports by creating dashboards that present KPIs (key performance indicators) and because the reports have no impact on decision making.

In our experience, we have seen reports that have hundreds of tabs while others have thousands of cells to review, and then there are companies that have hundreds of reports. The question to ask is, how can managers and employees review these reports and know what is truly important? How does an employee look at this much data and make a decision that has an impact on the company? Instead, interview the managers and employees and ask them what is important to them and why it is important and create a new report or dashboard for their use. Then eliminate the noise of the reports and simplify it for them by only showing what they need to know. If there are issues, then detailed reports should be available for review.

Review the monthly reporting process and document the goals and the agenda of the meetings. Evaluate the purpose, the takeaways, the follow-ups and the communication during the meetings. As an example, is the finance and accounting department running the financial statements and then reviewing these with the management team, or are they creating an executive summary that concentrates on specific KPIs that drive growth and profitability.

The monthly process should also be tied to the strategy and the success or failure of the strategy based on the analytics. As an example, if one goal of the strategy is to increase revenue by 20% by the end of quarter one, then these KPIs should be reviewed in comparison to the goal during these meetings. If the goals are not being met, then review the strategy and goals. Discuss and

determine if the goals are too aggressive or if the strategy is not working and needs to be modified to meet the goals. Create an action item list with a timeline to resolve.

One other area that must be considered is how to hold employees accountable to the goals that have been set. The managers should be involved in the decision-making to set goals, but once they are set, then they should be responsible for meeting those goals. Each month, the managers should enter any comments, and if they are continually short of their goals, then there should be warnings, write-ups, and potentially termination or demotion.

Below are additional best practices in regards to reporting and analysis:

- ✓ **Process:** improve the process to enable more time for decision-making. Use technology to assist in improving the processes and enabling access to data to assist in better decision-making.
- ✓ **Review Variances:** examine variances monthly with department heads and document the reasons for the variances. The comments should be saved and accessible anytime.
- ✓ **Action Items:** determine and document any action items that must be taken to improve negative variances or to enhance positive variances.
- ✓ **KPIs:** create a KPI report for management and separate dashboards for each department head. The dashboard should provide managers with the ability to be observant and prepared for any possible issue that may arise. KPIs should be achievable and clearly visible, and all wins should be celebrated.
- ✓ **Performance:** use KPIs to view the top performers and to ensure that the underperformers are not hiding. The KPIs provide evidence and facts and remove speculation around success and failure.
- ✓ **All Employees:** try to have at least one KPI on every person in the organization. The employee and the manager should have access to the KPI to view at any time.
- ✓ **Forward Thinking:** typically, KPIs are based on what has happened, but include at least a couple of forward-thinking KPIs.
- ✓ **Monthly Meeting:** change the monthly meetings to concentrate on the KPIs and use the reports as backup or for additional detail. Create an agenda and an executive summary to ensure that the meeting stays on task and concentrates on the main areas of success and concern.

Best in Class Internal Processes

The question that may come to mind is how to create a best-in-class process and implement it across the organization. Our organization changed the monthly financial process and our monthly reporting, and analysis process has become much improved. Prior to the changes, our financial statements were emailed out to the executive team, and some questions were emailed back to the controller. Our first step was to whiteboard what the purpose of the meeting was and what we were each looking for from these meetings. The next step was to determine the areas that impact our decision-making and ascertain if the data exists. We mapped out a plan to change the process, documented it, and reviewed it. Once everyone was on board, then we assigned tasks and set a timeline. Since then we have continually pushed ourselves not to be complacent in our meetings and strive for constant improvement.

The *why* question is what is truly important here. The executives felt it must be changed in order for us to improve our decision-making and to ensure that decisions were being made on correct information. Previously, each of the executives would review the financial statements and come to different conclusions and then never discuss it with anyone else. Also, the decisions were being made without having data to analyze it and no way to determine afterwards if it was successful or not. There were also no KPIs or goals to track the success or failures of the strategies and initiatives; therefore, we knew we had to change our processes to succeed.

The following phase was to determine the KPIs that were most important to our business, and we made a list of them. Some of the measures could not be calculated, such as an international gross profit, departmental gross profit, or renewal rates on maintenance and support. Therefore, we brainstormed how we would allocate the general ledger data with a goal to calculate the KPIs efficiently. We documented it, manually tested it, and then built the allocations within our software. The allocation calculations were based on headcount, square feet, international revenue, and allocation of executive time to departments, but we also moved the majority of salaries and benefits to cost of sales in order to calculate a gross margin for each department. The departmental income statements can be viewed and analyzed either pre-allocation or post-allocation, which allows the managers to review their department's EBITDA prior to allocation or view the gross margin after allocation. The gross margin after allocation enables the managers to concentrate on improving efficiencies, and they use it as a tool for hiring practices.

Subsequently, we had to add any data that we didn't have, which mostly concentrated on revenue detail and the way it was being booked. Our accounting department went through a thorough validation each month to ensure that each detail line item had the correct information and provided thorough revenue analysis.

We now had the data to calculate the KPIs and we manually created them in Excel to ensure that they were reasonable. Our team created the KPIs in the reporting tool, created the dashboards, and validated the values to ensure correctness. The KPIs are the first item that reviewed with managers and executives during our monthly analysis meeting. This is analyzed and reviewed prior to examining the detail reports, such as the income statements, balance sheet, sales by person, and accounts receivable.

The departmental managers also now have a monthly process to review their financials. Previously, it was sent to them with no discussion, and KPIs were never even discussed with them. Our accounting department reviews variances and documents the reasons for the variances, such as increased commission payments, lower revenue due to a low bill rate, and higher support renewals due to a marketing campaign.

The entire management team now has much better information to make decisions and is held accountable to the data during the monthly analysis. Some of the data, such as revenue, can be viewed daily, and others, such as financials, are viewed monthly. The process derived is detailed in a calendar that the management team has access to. Below is a sample of a monthly calendar of important steps that the management team is responsible for annually.

Month	1st Month	Middle of Month	End Month	Varies Throughout Month
January	Social - Company Destination Event - Location Planning Q4 Commission Calculations	Best Places to Work in Los Angeles - Application Determine Top Performers for Top Performers Trip Departmental & Corporate Financial Review & Comments	Plan and Book Location for Solver Strategy Meeting Leadership Team Meeting	3-Monthly Project Task Meetings
February		Departmental & Corporate Financial Review & Comments	Executive Meeting	3-Monthly Project Task Meetings
March		Departmental & Corporate Financial Review & Comments	Best Places to Work in Los Angeles - Company Survey	3-Monthly Project Task Meetings
April	Best Places to Work in Los Angeles - Email List Q1 Commission Calculations	Departmental & Corporate Financial Review & Comments Best Places to Work in Los Angeles - Employee Survey	Quarterly Forecast Leadership Team Meeting	Open Enrollment Announcements and Details 3-Monthly Project Task Meetings Garner Magic Day and Decisions
May	Focus - Start Planning Destination for Following Year	Top Performers Trip Management Strategy Meeting Departmental & Corporate Financial Review & Comments	Executive Meeting	3-Monthly Project Task Meetings Benefit Selections by Employees
June		Departmental & Corporate Financial Review & Comments		3-Monthly Project Task Meetings
July	Q2 Commission Calculations	Departmental & Corporate Financial Review & Comments Departmental Strategy Due	Leadership Team Meeting Quarterly Forecast	3-Monthly Project Task Meetings Sage Summit Conference
August	Focus - Finalize Location and Contract for Following Year Focus Presentation Practice and Recordings	Departmental & Corporate Financial Review & Comments	Focus Conference Company Destination Event Solver Day - International May the Foras	Best Places to Work in Los Angeles - Announcement 3-Monthly Project Task Meetings
September	Social - Plan for Holiday Events	Departmental & Corporate Financial Review & Comments	Executive Meeting	3-Monthly Project Task Meetings Garner Magic Quotient Evaluation and Questionnaire
October	Solver Budget Kickoff Q3 Commission Calculations	Solver Sales Revenue Budget Departmental & Corporate Financial Review & Comments	Leadership Team Meeting Quarterly Forecast	3-Monthly Project Task Meetings Dynamics Summit Conference
November	Solver Departmental Revenue Budget Solver Revenue Budget Finalize	Solver Departmental Personnel Budget Departmental & Corporate Financial Review & Comments	Executive Meeting	Performance Reviews - Write Ups by Managers (All) 3-Monthly Project Task Meetings
December	Determine Year-End Bonus	Solver Budget Finalized and Distributed Departmental & Corporate Financial Review & Comments Recusent Company Holidays - Epiphany	Los Angeles Office Holiday Dinner	Performance Reviews with Employees 3-Monthly Project Task Meetings

Readiness Checklist

Item	Your Score (1 Lowest – 10 Best)	Notes
Documented Strategy Completed		
Implemented a Communication Plan Regarding the Strategy		
Documented Goals that can be Tracked and Compared to Actual		
Review Strategic Initiatives and those Responsible are Held Accountable to Complete		
Link Strategy and Goals to Budget Process		
Create Calendar for Periodic Meetings to Review Status of Strategic Initiatives vs. Goals		
Total		

Chapter 6

Designing Your Own World-Class CPM Model - A Blueprint

“My interest is in the future because I am going to spend the rest of my life there.”

--C.F. Kettering

The purpose of a CPM solution in an organization has been discussed in prior chapters; therefore, this chapter will review how to design a CPM solution and will provide many examples, including strategy, goals, planning, and analysis.

Strategy and Goals

There are numerous reasons for communicating strategy, and many were listed in prior chapters, but very few organizations include strategy as part of the planning process. The managers and employees who are involved in the budgeting and forecasting process must know the strategy and goals prior to the planning process, but it also should be front and center while entering the data. A goal of the organization should be to provide the strategy and goals prior, during, and after the data entry.

Organization-wide

First define the organization, which includes the organization's purpose, core values, and big hairy audacious goal. Some of these may not change over time but it should still be reviewed and entered annually to ensure that they are being reviewed. Other areas, such as SWOT (strengths, weaknesses, opportunities, and threats), industry trends, and key initiatives will change regularly and can be modified quarterly. Below is a sample of an input form that allows input to the items above.

Company's Purpose
We will inspire our employees to be the best they can be. We will engage in sustainable practices and anticipate the needs of our customers.
We will maximize return to the stockholders while still maintaining quality in our products.
Core Values and Beliefs
Build Relationships that Last
Be Optimistic
Honest Communications
Strive for Balance
Show that you Care
Strengths
Full BI Suite
Very effective marketing and sales model
Low cost for implementation
Employee expertise in BI
Brand awareness

Weaknesses
Training of partners
5-10 year product vision
Direct deals to customers outside of partner channel
International expansion
Opportunities
Expand partner network
OEM channels
New ERP offerings
Expand geographically around the world
Threats
Competitors that merge or large company buys a competitor
Loss of focus
Pressure to lower prices
Economic slowdown

Trends
Cloud adopters
Mining into more data
Self-service analytics
Data visualization & integration
Big Hairy Audacious Goal (BHAG)
To be the premier BI company
Key Initiatives
Cloud enablement
Expand and improve partner network
ERP Rollouts
Grow internationally

The second section of the template is inputting strategic goals based on the inputs above. These values should be used as a basis for the budget and forecast. Goals are only valuable if the actual data can be compared against it on a monthly, quarterly, and annual timeframe. As an example, if a goal is to increase retention of customers to 95% annually, but there is no way to track if the goal is reached, then it is not a valuable goal. Typically the goals should be input quarterly for the first year or two and then annually over the next three to four years. The goals versus actual reporting should be visible and personal to the management team. It should also be the start of the monthly meeting to review the financials. Below is a sample input form. The goals inputs are FTEs, cash, gross profit, net income, revenue, accounts receivable days, number of customers, and revenue per employee.

	Q1-2017	Q2-2017	Q3-2017	Q4-2017	2018	2019	2020	2021
FTEs	52.4	52.9	53.5	54.0	56.2	58.4	60.7	63.2
Earning Assets	125,000,000	126,250,000	127,512,500	128,787,625	133,939,130	139,296,695	144,868,563	150,663,306
Deposits	100,000,000	101,000,000	102,010,000	103,030,100	107,151,304	111,437,356	115,894,850	120,530,644
Net Income	1,500,000	1,515,000	1,530,150	1,545,452	1,607,270	1,671,560	1,738,423	1,807,960
Revenues	3,750,000	3,835,443	3,923,462	4,014,160	4,229,657	4,457,494	4,698,440	4,953,314
NPAs	2.50%	2.49%	2.48%	2.47%	2.46%	2.45%	2.44%	2.43%
# of Households	4,000	4,040	4,080	4,121	4,286	4,457	4,636	4,821
Revenue per FTE	71,542	72,448	73,377	74,329	75,308	76,312	77,343	78,402

The report below compares the goals entered against the year-to-date actual. It also shows the remaining goals over a five-year period and all of the information about the company that was entered above. This allows for an analysis of the goals and the strategy at the same time.

Strategic Report
Consolidated

Account Description	YTD Actual	YTD Goal	Variance	% Variance	2018 Goal	2019 Goal	2020 Goal	2021 Goal
FTEs	341	345	(4)	-2.7%	300	325	350	400
Cash & Equivalents	4,416,530	4,300,000	116,530	2.7%	5,000,000	6,000,000	7,000,000	8,000,000
Gross Profit	45,712,094	45,000,000	712,094	1.6%	65,000,000	70,000,000	75,000,000	80,000,000
Net Income	953,703	750,000	203,703	27.2%	1,025,000	2,000,000	3,000,000	4,000,000
Revenue	57,511,584	55,500,000	2,011,584	3.6%	80,000,000	90,000,000	105,000,000	130,000,000
Account Receivable Days	40	38	2	5.3%	38	38	38	38
# of Customers	150	145	5	3.4%	700	880	1,020	1,300
Revenue by Employee	407,508	382,759	24,749	6.5%	266,667	276,923	300,000	325,000

<p>Company's Purpose Inspire our employees to be the best they can be. Engage in sustainable practices and anticipate the needs of our customers. We will maximize return to the stockholders while still maintaining quality in our products.</p>	<p>Core Values & Beliefs Build Relationships that Last & Be Optimistic Honest Communications & Strive for Balance Show that you Care</p>
<p>Strengths Full BI Suite Very effective marketing and sales model Low cost for implementation Employee expertise in BI Brand awareness</p>	<p>Weaknesses Training of partners 5-10 year product vision Direct deals to customers outside of partner channel International expansion</p>
<p>Opportunities Expand partner network OEM channels New ERP offerings Expand geographically around the world</p>	<p>Threats Competitors that merge or large company buys a competitor Loss of focus Pressure to lower prices Economic slowdown</p>
<p>Trends Cloud adopters Mining into more data Self-service analytics Data visualization Data integration</p>	<p>Big Hairy Audacious Goal To be the premier BI company</p>

Departmental

The departmental strategy and goals are very similar to the corporate templates, but a lot of the sections are not needed. The company's purpose, core values, trends, threats, and big audacious goal are not necessary, as these derive from the corporate strategy and are pushed down to the departments. However, knowing each department's strengths, weaknesses, opportunities, and threats is very important and should be documented as it can change over time. This can be viewed at the corporate level as well to see how weaknesses are improved upon, strengths are magnified,

opportunities are taken advantage of, and threats are minimized. Entering goals is very important, not just at the corporate level but for each department. The departmental goals should correspond to the corporate goals. The input should be similar to the corporate level. Below is a sample of the report for the sales department:

Strategic Report
Sales Department

Account Description	YTD Actual	YTD Goal	Variance	% Variance	2018 Goal	2019 Goal	2020 Goal	2021 Goal
Product Sales	7,562,564	7,547,757	314,837	4.2%	10,016,160	11,017,776	12,119,554	13,331,509
# of New Customers	150	145	5	3.4%	700	880	1,020	1,300
Average Profit Margin/Sale	26,543	25,000	1,543	6.2%	25,000	27,500	30,250	33,275
Number of Qualified Leads	923	950	(27)	-2.8%	1,200	1,320	1,500	1,650
Close Rate	16.3%	15.3%	1.0%	6.5%	17.0%	20.0%	25.0%	30.0%
Average Software Price	50,417	50,000	417	0.8%	50,000	55,000	60,000	65,000

Strengths Global sales team who is knowledgeable in BI Sell a full BI Suite Sales team is trustworthy Customer Service Demo Models	Weaknesses Some Salespeople are Underperformers Communication Between Service and Sales Too Quick to Discount Inconsistency in Message Across Sales Team Turnover
Opportunities Replace Weak Performers Enterprise Customers Improved Training Improve Processes to Improve Consistency	Threats Increased Competition Complacency Social Media Economic Slowdown

Strategic Initiatives

Initiatives are internal projects that enable strategies to be successful. Strategies without detailed plans and persons responsible for their success will fail. Companies should not have more than a few initiatives a year, as it is imperative that employees across the organization understand them. However, within each initiative, there will be many projects and tasks that need to be completed in order to complete the initiative and hit or surpass the goals.

The samples below will assist in setting up a culture of completing the initiatives on time. A manager or executive should be assigned as the person responsible to complete each initiative project. In order to succeed, it is imperative that the executives and managers responsible for completing these projects meet on a regular basis, whether weekly or bi-monthly to check status as discussed in the prior chapter.

Below is an example of a template that can be used to track the initiative tasks. The following cells are entered or chosen in this example: the responsible employee for the task, task description, the initiative chosen from the drop-down box, current status, the expected completion data, and the percentage completed.

Corporate Strategy - Initiative Tasks

Responsible	Initiative Task	Strategic Initiative	Status	Completion Date	% Complete
Luis Pietrynski	Secure Servers	Cloud enablement	Met with vendors. Securing pricing.	06/01/17	35%
Tracy Molina	Set software pricing	Cloud enablement	Created initial pricing document. Sharing with other entities.	06/30/17	50%
Dustin McCann	Work on cloud operations manual	Cloud enablement	Met with IT, Development, Sales, and Marketing for outline of plan.	09/30/17	30%
Carlos Johnson	Finalize metadata for ERP XYZ	ERP Rollouts	Currently testing multiple reports on data on multiple modules.	06/30/17	65%
Michael Carroll	Rollout for ERP ABC	ERP Rollouts	Finalizing marketing and release notes.	04/30/17	80%
Arianna Jackson	Partner program	Expand and improve partner network	Document manual and communicate internally and externally.	05/15/17	65%
Roy Podsednik	Market to new ERP's	Expand and improve partner network	Look for partners for ERP's ABC and XYZ. Contact and communicate advantages of our software.	04/15/17	50%
Freddie Mauer	Africa Office	Grow internationally	Have interviewed many leaders and narrowing down to 2. Then present to board.	05/30/17	40%

Accountability

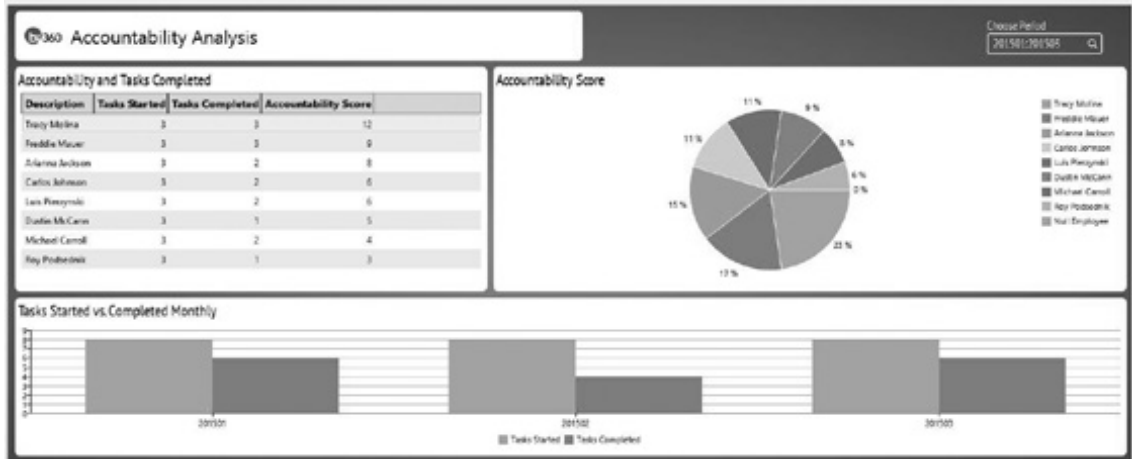
Along with initiatives, an organization can track the successes and failures of employees. They can also track the importance of each task to the organization. This way, an employee who completes many tasks may seem more valuable than an employee who only completes a few tasks, but by tracking this it may be viewed that the latter is much more valuable. An example is an employee who completes 10 mundane tasks that each take a couple of hours to complete. They are still vital, but many employees could have completed these same tasks. The latter employee, however, worked on tasks that required planning, dedication, is vital to the growth of the company, and required many hours of work.

The example below lists each of the tasks from the example above and allows for just a few inputs: status on what was promised from the last meeting, a Yes/No question on whether it was completed, what is expected to be completed prior to the next meeting, and a score of 1-5 entered by an administrator. A score of one (1) is a task that has a low impact on the organization while a score of five (5) has a high impact. The actual score, the last column, will be equal to the corporate score if the task was completed. If it was not completed, then the score will be zero (0).

Corporate Strategy - Accountability

Responsible	Initiative Task	Last Update's Activities	Last Update's Comments	Completed?	Activities to Complete for next Update	Corp Score	Account Score
Luis Pietrynski	Secure Servers	Finalize contracts with vendors	Contracts were finalized.	Yes	Sign contracts with vendors	3	3
Tracy Molina	Set software pricing	Finalize draft document	Draft document completed	Yes	Send out draft 1 to executive teams	4	4
Dustin McCann	Work on cloud operations manual	Document chapter 1 on Cloud Summary	Cloud summary started, but not finalized	No	Finish Cloud 1 Summary, Document chapter 2 on IT downtime	5	0
Carlos Johnson	Finalize metadata for ERP XYZ	Finalize first version of meta data	Metadata version completed & ready for testing	Yes	Test 3 reports on the first metadata version	3	3
Michael Carroll	Rollout for ERP ABC	Finish version 1 of documentation	Documentation completed and approved	Yes	Finalize documentation and post to site	2	2
Arianna Jackson	Partner program	Finalize version 1 of the documentation	Partner program documented	Yes	Discuss proposal with executive team	4	4
Roy Podsednik	Market to new ERP's	Finish marketing plan & get approval from board	Marketing plan approved, board has more questions.	No	Meet with board, announce marketing plan and send press release	3	0
Freddie Mauer	Africa Office	Finalize selection of new Office CEO	New CEO approved by board	Yes	Finalize contract with new office	3	3

Multiple reports or a dashboard can be created to analyze the data. Below is a dashboard example that first has a table showing tasks started, completed, and an accountability score. Then there is a pie chart on the accountability score, and the bottom graph displays total tasks started versus completed by month.



Budgeting

Budgeting is a topic that is not very popular in most organizations, and it can be a very time-consuming project for many employees. This is why it is important to communicate the importance of a budget to all employees so they take pride and ownership of it. Also, do not make complex templates, as the goal is an estimate for the coming year. If employees cannot have small variances, then they will make decisions that only impact their results against the budget and not what is in the best long-term interest of the organization.

The goal of a budget should be to give an approximate estimation of how the organization will do in the coming year and to provide information on how investment money can be spent, which should be based on the company strategies and initiatives. The goal should not be to budget down to each dollar. As an example, one company budgeted down to an employee cost of \$6.52 per month per employee. The company was asked whether the cost could be estimated as a total for each department, but they claimed they needed it down to the dollar; however, budgeting at the department level and allowing a five percent variance would have had no impact on the decisions that the company made. Another important item to understand is what an acceptable variance for an organization is. As an example, if there is a five percent variance in the revenue, then would this impact the decisions that the company will make in the coming year?

This section will review bottom-up budgeting and provide many examples of these templates. Other sections will discuss templates specific to an industry, tying the budget to the strategic goals, and top-down budgeting.

The one template that has a lot of impact for organizations is personnel budgeting due to the high proportion of costs of an organization. This is the one template that has similarities across all companies, but at the same time, very few can use the exact same template. There are many variables to consider, such as the type of raise, how many raises, overtime, bonuses, commissions, taxes, benefits, and IT costs to name a few. It is also important to know whether to budget by employee or by position.

Budgeting by position allows an organization to ignore employee names, terminations, and having to hire employees to replace a terminated employee. It also allows budgeting by multiple employees. As an example, a template can allow a manager to input how many accountants should be employed, what the average salary is, and what the average raise would be. When budgeting by employees, then each accountant should be listed, the employee's exact salary, each person's expected raise, and all other information specific to each employee. Budgeting by employee will be more accurate if there is little employee turnover, but it also requires more work.

Other items to keep in mind with personnel is how to allocate monthly salary, which impacts tax and benefit calculations. Salary can be allocated evenly, by work days in a month, by calendar days, by pay periods, and in other numerous ways. Another item to consider is separating out full-time and part-time employees, as there may be differences in the benefits that are allocated to part-time employees, such as overtime and 401k. These are all calculations that must be built into the payroll form.

A good first step is creating an assumptions template, which allows an administrator to enter data that will impact the calculations of many templates and therefore does not have to be hardcoded into the templates themselves. This data will flow from the form into all other templates. Below is an example of an assumptions template, which includes payroll tax rates, worker's compensation rate, benefit rate (for health, dental, and vision), and the number of days in each month, which is used for accurate monthly allocation:

Assumption Form for Budget

Payroll Assumption	Account	Period	Rate	Maximum	Medicare
Taxes					
Payroll Taxes - FICA	61500		6.20%	118,500	1.45%
Payroll Taxes - FUTA	61510		6.00%	7,000	
Payroll Taxes - SUTA	61520		0.90%	7,000	
Payroll Taxes - Workers Compensation	61530		5.00%		
Benefits					
Benefits	61540		Monthly \$	400	
Days per Month					
Days per Month	90020	Jan	31		
Days per Month	90020	Feb	28		
Days per Month	90020	Mar	31		
Days per Month	90020	Apr	30		
Days per Month	90020	May	31		
Days per Month	90020	Jun	30		
Days per Month	90020	Jul	31		
Days per Month	90020	Aug	31		
Days per Month	90020	Sep	30		
Days per Month	90020	Oct	31		
Days per Month	90020	Nov	30		
Days per Month	90020	Dec	31		
Total Days			365		

The data from the assumption form will then flow into the payroll form. The print screen below will not be able to show all of the monthly benefits and taxes calculated, as the template has 142 columns. Each tax and benefit will have 13 columns – one for each of the 12 months and one for the subsequent benefit or tax total. In the print screen below, the summary of each tax and benefit will show as a monthly total at the bottom.

Payroll Budget

Employee Name	Title	Hire Date	Est. Months	Annual Salary	Rate	Mths./Yr.	% FTE	FTE	FTE Rate	Salary												Total Salary							
										Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08								
Full Time Employees																													
Sales & Marketing																													
Roy Pioduchuk	Sales Manager	05/09/08	2,080.0	77.00	188,140		Apr	10.7%	84.76	176,176	9,000	Y	13,813	12,289	13,800	14,480	14,961	14,480	14,961	14,960	14,960	14,960	14,960	172,227					
Aranka Johnson	Marketing Director	09/09/08	2,080.0	12.68	161,079				72.68	161,079	10,000	Y	12,851	11,889	12,850	13,417	12,851	12,851	12,851	12,851	12,851	12,851	12,851	12,851	12,851	161,079			
Boeth Young	Marketing Manager	03/02/09	2,080.0	17.75	126,120				17.75	126,120	10,000	Y	10,202	9,273	10,200	10,673	10,200	9,875	0	0	0	0	0	0	0	126,120			
Traci Worthington	Marketing Execut.	06/12/04	2,080.0	15.00	71,800				15.00	71,800	10,000	Y	6,219	5,583	6,215	5,884	6,215	5,884	6,215	6,187	5,884	5,583	5,884	5,583	71,800				
Karen Caut	Salesman	06/09/04	2,080.0	45.30	94,640				45.30	94,640	10,000	Y	8,018	7,380	8,018	7,779	8,018	8,018	8,018	8,018	8,018	8,018	7,779	8,018	94,640				
Kevin Stubbis	Salesman	09/09/08	2,080.0	49.75	101,000				49.75	101,000	10,000	Y	7,329	6,981	7,329	7,329	7,329	7,329	7,329	7,329	7,329	7,329	7,329	7,329	101,000				
Joerg Strauch	Salesman	03/02/09	2,080.0	36.75	76,440				36.75	76,440	10,000	Y	6,412	5,884	6,412	6,203	6,412	6,412	6,412	6,412	6,412	6,412	6,412	6,412	76,440				
Alicia Walker	Salesman	06/12/04	2,080.0	38.75	79,440				38.75	79,440	10,000	Y	6,412	5,884	6,412	6,203	6,412	6,412	6,412	6,412	6,412	6,412	6,412	6,412	79,440				
Adriana Sempster	Salesman	07/15/08	2,080.0	36.01	74,897				36.01	74,897	10,000	Y	6,361	5,748	6,361	6,236	6,361	6,361	6,361	6,361	6,361	6,361	6,361	6,361	74,897				
Total Full Time										71,513	70,869	71,513	71,719	70,791	71,719	71,513	71,513	71,513	71,513	71,513	71,513	71,513	71,513	71,513	71,513				
Part Time Employees																													
Health Care																													
Neilson Gray	Salesman	06/09/04	2,080.0	30.00	62,400				30.00	62,400	10,000	N	3,509	4,787	3,509	3,529	3,509	3,529	3,509	3,509	3,529	3,509	3,529	3,509	62,400				
Pauline Brantley	Salesman	06/09/08	2,080.0	24.00	51,360				0.00	0	10,000	N	4,562	3,910	4,562	4,221	4,562	4,562	4,562	4,562	4,562	4,562	4,562	4,562	51,360				
Total Part Time										6,071	6,726	6,071	6,750	6,071	6,750	6,071	6,071	6,750	6,071	6,750	6,071	6,750	6,071						
80000 Full Time - Salary														71,811	70,869	71,811	71,719	70,791	71,719	71,513	71,513	71,513	71,513	71,513	71,513	71,513	71,513	71,811	
80000 Full Time - Commission														819	787	819	822	819	822	819	819	819	820	819	822	819	822	819	819
80000 Part Time - Bonns														429	384	429	411	429	411	429	429	411	429	411	429	411	429	411	429
80000 Part Time - Salary														6,071	6,726	6,071	6,750	6,071	6,750	6,071	6,071	6,750	6,071	6,750	6,071	6,750	6,071	6,750	
80000 Part Time - Overtime														0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80000 Part Time - Bonus														0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80000 Payroll Taxes - FICA														6,718	6,142	6,718	6,689	6,718	6,689	6,718	6,718	6,718	6,718	6,718	6,718	6,718	6,718	6,718	6,718
80000 Payroll Taxes - FUTA														4,211	404	4,211	4,211	4,211	4,211	4,211	4,211	4,211	4,211	4,211	4,211	4,211	4,211	4,211	4,211
80000 Payroll Taxes - SUTA														612	61	612	612	612	612	612	612	612	612	612	612	612	612	612	612
80000 Payroll Taxes - Worker's Compensation														4,412	4,823	4,412	4,896	4,412	4,896	4,412	4,412	4,412	4,412	4,412	4,412	4,412	4,412	4,412	4,412
80000 Benefits														3,418	3,480	3,418	3,480	3,418	3,480	3,418	3,418	3,418	3,418	3,418	3,418	3,418	3,418	3,418	3,418
80000 PTO														31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
Total Salary and Benefits - Budget														104,551	94,492	104,799	103,961	103,243	104,561	104,918	104,918	104,918	104,918	104,918	104,918	104,918	104,918	104,918	104,918
Total Salary and Benefits - 2007 Forecast														0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Variance														104,551	94,492	104,799	103,961	103,243	104,561	104,918	104,918	104,918	104,918	104,918	104,918	104,918	104,918	104,918	104,918

There may also be a need to allocate an employee across multiple departments. In this case, there are two options: 1) budget everyone to a “dummy” department and then allocate the salaries, taxes,

The other template that is typically used across most organizations is an expense budget, which allows for input for accounts that have not been budgeted already through other templates, such as personnel and capital. There are a few ways of handling other expenses, and below are a few recommendations to make the input more accurate and efficient:

- 1) Show prior year actual and forecast by account. This allows the users to easily compare to the prior year and ensure that they are not under or over budget for each account.
- 2) Allow users to enter detail for each account. As an example, for marketing expenses it will be beneficial to know what makes up the monthly amount rather than having employees keep this information separately.
- 3) Show the accounts that were budgeted in other templates, but lock these accounts down so that the values can't be modified.

Below is a print screen, but note that only one month of the prior year comparison appears due to space limitations, but in the full template all 12 months are available to the budget user. The second print screen is an example of entering line-item detail for the marketing account.

Other Expenses														YTD Total	YTD Percent	Actual Jan	Actual Feb
Act	Description	Budget Jan	Budget Feb	Budget Mar	Budget Apr	Budget May	Budget Jun	Budget Jul	Budget Aug	Budget Sep	Budget Oct	Budget Nov	Budget Dec				
Operating Expenses																	
60000	Advertising	187,188	190,811	188,096	224,247	126,247	192,298	196,764	176,269	162,096	194,231	178,532	208,100	2,004,610	4.2%	167,612	161,207
60000	Conferences and seminars	1,571	1,223	1,959	1,348	1,257	1,632	1,821	1,493	1,988	1,290	1,471	1,037	17,764	0.4%	1,299	1,289
60000	Advertising	413	421	409	443	413	524	508	565	425	462	598	738	6,085	0.7%	427	431
64000	Consulting	3,788	3,423	3,232	3,158	2,872	4,344	4,007	3,989	2,981	3,980	3,381	4,399	41,874	8.5%	3,677	3,435
64000	Audit and Accounting	529	579	518	497	535	749	790	869	622	851	857	785	2,577	0.5%	552	673
64000	Legal	2,966	3,055	2,748	2,532	2,365	3,090	3,921	3,247	2,832	2,827	3,395	4,183	37,291	7.8%	3,610	3,121
69000	Insurance	1,883	1,351	1,584	1,420	1,254	1,823	1,770	1,795	1,613	1,428	1,747	1,890	10,536	2.2%	1,342	1,524
67000	Office Supplies	1,089	1,087	979	1,619	811	1,227	1,238	1,178	1,079	1,068	964	1,538	13,149	2.8%	1,679	1,088
69000	Telephone	3,254	2,717	2,649	2,342	2,587	4,032	3,295	2,929	2,812	2,980	3,502	3,340	36,999	7.8%	3,214	3,083
69000	Telephone - Cellular	1,129	913	895	814	961	1,120	1,096	1,098	1,038	932	1,298	1,461	12,837	2.7%	1,612	962
69000	Rent	1,375	2,789	2,652	2,636	2,805	2,454	3,050	3,018	3,118	3,116	3,628	4,424	38,665	8.4%	3,209	2,845
70000	Dues, Licenses and Permits	3,485	2,483	3,189	2,743	2,518	4,026	3,625	3,151	2,755	3,385	3,324	4,180	38,586	8.4%	3,254	2,924
70040	Books and Subscriptions	297	281	294	295	277	388	409	391	323	290	374	441	4,500	0.9%	288	324
Accounts Budgeted on Other Forms																	
60000	Full Time - Salary	100,749*	90,999	120,749*	97,499	108,749*	97,499	100,749	100,749*	97,499	100,749*	97,499	100,749	1,386,234	29.3%	80,731	72,109
60000	Part Time - Salary	12,366*	11,169	12,366*	11,967	12,366*	11,967	12,366	12,366*	11,967	12,366*	11,967	12,366	147,600	31.4%	7,889	8,137
63000	Travel	2,991	2,991	2,991	2,991	2,991	2,991	2,991	2,991	2,991	2,991	2,991	2,991	35,957	7.7%	803	759
Total Expenses		126,633	126,633	126,633	126,633	126,633	126,633	126,633	126,633	126,633	126,633	126,633	126,633	1,440,666	3.1%	126,633	126,633
Total Expenses Last Year		278,798	283,892	294,007	242,684	214,257	322,658	317,328	317,142	257,948	246,578	281,485	351,893	3,356,948			
Total Expenses Budget		126,633	126,633	126,633	126,633	126,633	126,633	126,633	126,633	126,633	126,633	126,633	126,633	1,440,666			
Variance		-152,165	-157,259	-167,976	-123,951	-92,376	-105,981	-100,305	-90,491	-68,685	-79,055	-104,398	-125,260	-2,915,282			

Data Grid: Actual Forecast													
Description	January	February	March	April	May	June	July	August	September	October	November	December	Total
62010 Marketing	167,612	161,207	157,275	149,686	123,551	194,500	194,115	192,819	162,086	146,857	167,820	210,630	2,028,238
Input Grid: Budget													
Add Line Item		Spreading Method: Even		Value: 75000		Percent Adjustment: 0		Round Up: <input type="checkbox"/>		Decimal: 0			
Description	January	February	March	April	May	June	July	August	September	October	November	December	Total
62010 Marketing	72,917	72,917	72,917	72,917	72,917	72,917	72,917	72,917	72,917	72,917	72,917	72,917	875,000
1 Ads	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	300,000
2 Website	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	41,667	500,000
3 Contractors	6,250	6,250	6,250	6,250	6,250	6,250	6,250	6,250	6,250	6,250	6,250	6,250	75,000

Industry

There may be templates that are more industry specific or built towards the unique specifications of the organization. Typically these templates will be the revenue and cost of sales templates. There are probably many templates that are used today, but it is important to try to use only a handful of templates that can be designed and used across the entire organization. Also, it is good practice to create templates that will auto-calculate many of the revenue accounts and cost of sales accounts.

The first print screen is an example of a healthcare revenue template that is based on units, prices, and increases, and then revenue is calculated and compared to the prior year.

Account	Jan 18	Feb 18	Mar 18	Apr 18	May 18	Jun 18	Jul 18	Aug 18	Sep 18	Oct 18	Nov 18	Dec 18	Total FY	Total PY	Variance
Units/Prices Revenue															
Agreement Revenue															
Change Unit	41000	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1
Unit Increase (%)	41000	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Change Rate	41000	\$ 291.16	\$ 291.16	\$ 291.16	\$ 291.16	\$ 291.16	\$ 291.16	\$ 291.16	\$ 291.16	\$ 291.16	\$ 291.16	\$ 291.16	\$ 291.16	\$ 291.16	\$ 291.16
Price Increase (%)	41000	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
Revenue Change IP	41000	25,277.20	25,277.20	25,277.20	25,277.20	25,277.20	25,277.20	25,277.20	25,277.20	25,277.20	25,277.20	25,277.20	25,277.20	25,277.20	25,277.20
Revenue Calculation IP	41000	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92
IP Revenue Commercial Rate	41000	18,836	18,836	18,836	18,836	18,836	18,836	18,836	18,836	18,836	18,836	18,836	18,836	18,836	18,836
IP Revenue Medicaid Rate	41000	155,795	155,795	155,795	155,795	155,795	155,795	155,795	155,795	155,795	155,795	155,795	155,795	155,795	155,795
IP Revenue Medicare Rate	41000	33,324	33,324	33,324	33,324	33,324	33,324	33,324	33,324	33,324	33,324	33,324	33,324	33,324	33,324
IP Revenue Other Rate	41000	1,864	1,864	1,864	1,864	1,864	1,864	1,864	1,864	1,864	1,864	1,864	1,864	1,864	1,864
Total Agreement IP Revenue	41000	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92	188,955.92
Departmental Revenue															
Change Unit	42000	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1	500.1
Unit Increase (%)	42000	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Change Rate	42000	\$ 291,100.00	\$ 291,100.00	\$ 291,100.00	\$ 291,100.00	\$ 291,100.00	\$ 291,100.00	\$ 291,100.00	\$ 291,100.00	\$ 291,100.00	\$ 291,100.00	\$ 291,100.00	\$ 291,100.00	\$ 291,100.00	\$ 291,100.00
Price Increase (%)	42000	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
Revenue Change OP	42000	23,483.34	23,483.34	23,483.34	23,483.34	23,483.34	23,483.34	23,483.34	23,483.34	23,483.34	23,483.34	23,483.34	23,483.34	23,483.34	23,483.34
Revenue Calculation OP	42000	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05
OP Revenue Commercial Rate	42000	58,099.86	58,099.86	58,099.86	58,099.86	58,099.86	58,099.86	58,099.86	58,099.86	58,099.86	58,099.86	58,099.86	58,099.86	58,099.86	58,099.86
OP Revenue Medicaid Rate	42000	95,981.17	95,981.17	95,981.17	95,981.17	95,981.17	95,981.17	95,981.17	95,981.17	95,981.17	95,981.17	95,981.17	95,981.17	95,981.17	95,981.17
OP Revenue Medicare Rate	42000	70,859.58	70,859.58	70,859.58	70,859.58	70,859.58	70,859.58	70,859.58	70,859.58	70,859.58	70,859.58	70,859.58	70,859.58	70,859.58	70,859.58
OP Revenue Other Rate	42000	22,987.45	22,987.45	22,987.45	22,987.45	22,987.45	22,987.45	22,987.45	22,987.45	22,987.45	22,987.45	22,987.45	22,987.45	22,987.45	22,987.45
OP Revenue	42000	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05	186,962.05
OP Revenue Non-OTIP	42000	3,900.00	3,900.00	3,900.00	3,900.00	3,900.00	3,900.00	3,900.00	3,900.00	3,900.00	3,900.00	3,900.00	3,900.00	3,900.00	3,900.00

The next sample is a public sector expenditures template that displays the prior year's actual and adopted expenses. This template is available after the departmental manager has input their adjustments and comments. The baseline budget and the departmental adjustments calculate the departmental requested amount. Then the other offices, such as the budget office, the executive team, and the board can add or subtract adjustments to the departmental total to determine the final amount, which is the **Board Requested** amount. Also, each inputter has the ability to add comments.

Tie to Goals

As discussed in the Strategy and Goals section, it is important to tie the budget back to the goals finalized for the strategy. If the goals and the budget are not consistent, then what truly are the goals for the organization to achieve? As stated in the prior sections, the goals should also be communicated to the entire organization so that the budget is consistent with the goals and there is no confusion among the staff.

There are a few ways to assist the users in knowing the goals and initiatives while entering their budgets and forecasts. It is one thing to communicate it in meetings and in documentation, but it is much more effective to include the information directly in the template. As an example, the print screen below shows two separate ways to inform the end user of the corporate initiatives and a top-down budget: 1) show the company initiatives at the top of the template and 2) compare to the top-down budget created by the executive team.

Other Expenses		Initiatives																
		Cloud Enablement					ERP Rollouts											
		Expand & improve partner network					Grow internationally											
Acct	Description	Budget Jan	Budget Feb	Budget Mar	Budget Apr	Budget May	Budget Jun	Budget Jul	Budget Aug	Budget Sep	Budget Oct	Budget Nov	Budget Dec	Total	%/Dec Percent	%/Dec % Top	Top Budget	Four Year Total
Operating Expenses																		
52010	Marketing	187,168	150,831	144,956	134,347	124,247	137,268	195,218	176,289	162,085	155,331	171,532	206,500	2,004,432	-1.2%	1.9%	1,967,391	2,038,238
52020	Conferences and seminars	1,571	1,223	1,593	1,948	1,157	1,032	1,813	1,421	1,168	1,290	1,471	2,037	17,764	1.6%	0.0%	17,658	17,488
52030	Advertising	479	471	489	443	413	524	508	565	425	462	396	716	6,885	0.7%	1.8%	5,980	6,048
54010	Consulting	3,768	3,423	3,217	3,158	2,672	4,344	4,007	3,669	3,781	3,580	3,361	4,399	41,870	-1.5%	-4.4%	43,791	43,515
54020	Audit and Accounting	529	526	516	497	536	749	790	860	822	851	857	785	7,577	4.8%	-5.7%	8,037	7,958
54030	Legal	2,986	3,055	2,348	2,522	2,365	3,030	3,913	3,247	2,832	2,627	3,395	4,381	32,292	1.8%	0.2%	37,227	39,987
58010	Insurance	1,863	1,931	1,564	1,420	1,394	1,823	1,732	1,799	1,613	1,476	1,147	3,890	19,336	6.8%	5.3%	17,877	18,176
59010	Office Supplies	1,548	1,087	979	1,019	811	1,277	1,216	1,138	1,073	1,648	964	1,518	13,348	-0.1%	-1.1%	13,393	13,368
59020	Telephone	3,154	2,737	2,640	2,342	2,587	4,022	3,295	2,920	2,822	2,980	1,502	3,840	36,838	-1.8%	-0.8%	37,221	36,382
59030	Telephone - Cellular	1,129	933	963	814	861	1,120	1,086	1,090	1,029	932	1,148	1,421	12,617	0.4%	-2.0%	12,969	12,595
59030	Rent	8,175	7,789	7,651	2,686	2,605	3,454	8,020	3,638	3,328	3,126	1,628	4,414	38,665	-4.4%	-7.2%	41,658	48,844
70030	Dues, Licenses and Permits	3,465	2,483	3,349	2,743	2,518	4,086	3,616	3,161	2,755	3,266	3,124	4,380	38,588	1.7%	-4.6%	45,427	35,249
70040	Books and Subscriptions	297	281	294	295	277	358	419	391	323	290	174	441	4,508	4.8%	6.1%	3,863	3,842
Accounts Budgeted on Other Items																		
60010	Full Time - Salary	305,749	30,199	388,143	91,499	305,749	97,499	305,749	388,143	97,499	305,749	97,499	388,143	3,396,736	26.3%	26.3%	978,168	938,868
60020	Part Time - Salary	12,366	11,148	12,366	11,962	11,366	11,962	12,366	12,366	11,962	12,366	11,962	12,366	101,608	81.7%	21.7%	58,628	100,175
60030	Travel	2,991	2,991	2,991	2,991	2,991	2,991	2,991	2,991	2,991	2,991	2,991	2,991	36,891	237.4%	227.6%	30,957	30,138
Total Expenses		326,638	276,342	281,364	255,843	258,406	336,094	337,913	306,104	295,275	294,225	315,636	352,730	3,646,666	8.6%	10.0%	3,286,236	3,356,246
Total Expenses Last Year		0	0	0	0	0	0	0	0	0	0	0	0	3,296,236	3,316,542			
Total Expenses Budget		326,638	276,342	281,364	255,843	258,406	336,094	337,913	306,104	295,275	294,225	315,636	352,730	3,646,666				
Variance			-276,342	-281,364	-255,843	-258,406	-336,094	-337,913	-306,104	-295,275	-294,225	-315,636	-352,730		-239,776			

Top-Down

Top-down budgeting is a valuable first step in the budgeting or forecasting process because it allows a limited usage of resources to quickly create a budget or forecast early in the process and also allows for a comparison to the bottom-up budget, which may take months to complete. There are disadvantages to a top-down approach as well, but these are eliminated by doing both a bottom-up and top-down budget. If only a top-down budget is created, then it can impact employee morale as they are not invested in the success or failure of the budget as employees will not feel the same ownership in the budget process.

There are many ways to create a top-down budget, but our team has come up with a solution that will enable a top-down budget to be created in minutes. It is called a Breakback template. An entire top-down budget can be created with a single input. In this case, a manager or administrator simply enters the desired net income, and the monthly 12-month budget will be created. The user can make additional assumptions around specific departments, account groups, or individual accounts, such as the desired increase or decrease of that particular department, account group, or account.

As an example, the desired net Income is \$3,000,000. Store the template and now the top-down budget has been created and can be used in variance reporting. Note that only revenue and cost of sales is shown due to the size of the template. This template can be used to create the entire budget (as shown below) or for a forecast, which will be shown in the Forecasting section.

Profit & Loss Breakback - Create Forecast Based on Actual + Budget

Enter Desired Net Income		1,000,000																			
Act	Account Description	Actual YTD	BUD	Forecast	Variance (Decrease)	Calculated	What If Scenario	Est Jan	Est Feb	Est Mar	Est Apr	Est May	Est Jun	Est Jul	Est Aug	Est Sep	Est Oct	Est Nov	Est Dec	Total Budget	
Revenue																					
40000	Product Revenue	7,562,566	2,188,633	20,830,997		10,330,997	10,837,048	903,087	903,087	903,087	903,087	903,087	903,087	903,087	903,087	903,087	903,087	903,087	903,087	903,087	10,837,048
40000	Services Revenue	4,096,731	1,700,346	5,817,677		5,817,677	6,302,019	508,502	508,502	508,502	508,502	508,502	508,502	508,502	508,502	508,502	508,502	508,502	508,502	508,502	6,302,019
40000	Maintenance Revenue	745,818	210,233	1,006,849		1,006,849	1,055,329	87,544	87,544	87,544	87,544	87,544	87,544	87,544	87,544	87,544	87,544	87,544	87,544	87,544	1,055,329
40040	Other Revenue	363,792	154,965	518,755		518,755	544,165	45,347	45,347	45,347	45,347	45,347	45,347	45,347	45,347	45,347	45,347	45,347	45,347	45,347	544,165
Total Revenue		12,768,908	6,054,979	17,672,678		N/A	17,672,678	1,544,880	1,544,880	1,544,880	1,544,880	1,544,880	1,544,880	1,544,880	1,544,880	1,544,880	1,544,880	1,544,880	1,544,880	1,544,880	18,718,963
Cost of Sales																					
50000	COGS - Product Sales	346,052	951,305	1,293,353		1,297,363	1,340,913	113,409	113,409	113,409	113,409	113,409	113,409	113,409	113,409	113,409	113,409	113,409	113,409	113,409	1,340,913
Cost of Sales		346,052	951,305	1,293,353		N/A	1,297,363	113,409	113,409	113,409	113,409	113,409	113,409	113,409	113,409	113,409	113,409	113,409	113,409	113,409	1,340,913
Profit Margin		12,422,856	5,092,674	16,379,325		NA	16,375,315	1,431,471	1,431,471	1,431,471	1,431,471	1,431,471	1,431,471	1,431,471	1,431,471	1,431,471	1,431,471	1,431,471	1,431,471	1,431,471	17,378,050
Profit Margin %		97.3%	88.5%	92.7%		NA	92.7%	92.7%	92.7%	92.7%	92.7%	92.7%	92.7%	92.7%	92.7%	92.7%	92.7%	92.7%	92.7%	92.7%	92.7%
Net Income		2,376,804	2,812,322	2,839,911		3,000,000	2,839,911	230,000	230,000	230,000	230,000	230,000	230,000	230,000	230,000	230,000	230,000	230,000	230,000	230,000	3,000,000
Net Income %		20.2%	4.8%	16.2%		NA	16.2%	16.2%	16.2%	16.2%	16.2%	16.2%	16.2%	16.2%	16.2%	16.2%	16.2%	16.2%	16.2%	16.2%	16.2%

Forecasting

Forecasting is a good practice for all companies. This section will describe why it is important and how it is different than a budget, such as these five points:

- ✓ A forecast is normally a much quicker process and involves fewer employees.
- ✓ Forecasts, in general, are entered at the general ledger account level, while detailed templates, such as personnel templates, are not used.
- ✓ A budget is a company's intention for the coming year, while a forecast is the most up-to-date expectation of what will happen over the remaining months of the year.
- ✓ The budget is finalized prior to the start of the year while a forecast can be created monthly or quarterly once the year has started and actual data can be reviewed.
- ✓ Many companies create multi-year forecasts while budgets are only for the coming year.

The budget is created one to two months prior to the start of the year, so much of the budget is created up to fourteen months prior to the start of the month. As an example, the budget is finalized in November for a company based on a calendar fiscal year, which is a year prior until the next November happens. Much can change in the economy, industry, products, competitors, employees, and leadership of an organization. A forecast can more accurately take this into account and thus will impact decision-making.

Organizations can impact the bottom line by forecasting on a regular basis, whether in good times or bad. An organization will be much more agile by forecasting monthly, and doing so will impact some of the following decisions:

- ✓ Expense reduction and tightening up the authority to spend money.
- ✓ Employee raises, new hires, and terminations.
- ✓ Capital expenditures reductions or increases.
- ✓ Strategic planning and modifying initiatives.

A forecast should contain the current year actual data for the closed months and then allow the departmental managers to modify the amounts for the remaining months. It is a good practice to copy the budget data to the forecast, which will then allow managers to only concentrate on changes in the forecast. Another option is to show the prior year actual data as well. Below is an example of a forecast template, for three months, that is executed for the sales department:

Forecasting														Actual	Actual	Actual	Actual	Actual	
Account	Account Description	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Forecast Oct-17	Forecast Nov-17	Forecast Dec-17	TOTL	Jan-16	Feb-16	Mar-16	Apr-16	Actual May-16
Revenues																			
43010	Product Revenue	843,763	787,830	782,411	796,733	685,943	1,056,434	980,225	892,247	730,880	662,773	741,877	1,017,201	30,604,815	625,900	682,309	655,566	775,262	828,388
43030	Services Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
43040	Maintenance Revenue	75,856	84,414	79,133	76,925	70,812	532,328	68,778	68,090	59,864	69,638	66,795	66,793	878,782	70,908	80,280	68,608	76,920	68,758
43045	Other Revenue	42,274	35,503	38,354	35,894	32,725	64,601	62,294	50,123	51,472	41,421	41,131	53,278	504,612	33,254	36,006	35,517	44,005	31,754
Total Revenues		964,892	943,747	899,888	905,523	789,779	1,653,961	1,112,298	1,040,968	842,212	773,622	854,313	1,183,200	31,487,509	713,162	798,593	766,691	896,626	911,901
Cost of Goods Sold																			
50010	COGS - Product Sales	281,476	245,562	279,758	258,458	235,415	342,409	328,226	346,062	254,515	268,936	288,531	315,247	3,455,452	(254,652)	(280,172)	(228,202)	(251,806)	(243,853)
Total Cost of Goods Sold		281,476	245,562	279,758	258,458	235,415	342,409	328,226	346,062	254,515	268,936	288,531	315,247	3,455,452	(254,652)	(280,172)	(228,202)	(251,806)	(243,853)
Gross Profit		683,416	698,185	619,979	647,065	554,364	1,311,552	784,072	694,906	587,697	504,686	565,782	867,953	27,032,057	967,814	1,078,765	994,893	1,148,432	1,155,754
Gross Profit %		70.7%	73.8%	69.0%	71.6%	70.2%	71.6%	71.1%	66.8%	69.8%	65.2%	66.2%	71.8%	69.3%	135.8%	135.1%	125.7%	128.1%	126.7%
Expenses																			
60010	Full Time - Salary	59,432	52,823	63,318	57,239	46,800	75,130	64,240	79,546	56,415	54,787	55,521	66,371	228,328					
60020	Full Time - Commission	4,540	4,274	4,791	4,375	3,346	4,994	3,300	4,990	4,166	4,659	4,658	5,213	25,838					
60030	Full Time - Bonus	13,979	14,579	14,383	14,175	11,097	19,110	16,812	15,496	15,999	15,762	15,818	18,129	189,129					
60010	Part Time - Salary	6,407	5,583	6,578	5,854	4,736	7,443	7,953	6,820	6,115	5,631	6,247	7,764	26,421					
60340	Part Time - Overtime	1,825	1,527	1,613	1,377	1,254	1,698	1,930	1,936	1,593	1,209	1,431	1,600	18,614					
60350	Part Time - Bonus	2,527	2,403	2,446	2,108	1,720	2,739	2,405	2,904	1,975	2,173	2,442	2,790	28,480					
61300	Payroll Taxes - FICA	11,029	9,872	10,843	10,295	8,203	12,140	11,495	13,221	9,823	10,248	12,949	14,561	136,656					
61310	Payroll Taxes - FUTA	1,442	1,387	1,587	1,463	1,143	1,643	1,804	1,973	1,474	1,617	1,606	1,820	18,758					
61320	Payroll Taxes - SUTA	1,534	1,420	1,587	1,285	1,293	1,689	1,915	1,645	1,320	1,556	1,649	1,826	18,890					
61330	Payroll Taxes - Workers Compens	1,540	1,368	1,591	1,269	1,123	1,897	1,874	1,483	1,413	1,522	1,685	1,804	18,826					
61340	Benefits	286	289	299	299	230	343	337	338	274	325	338	381	3,321					
62010	Marketing	111,835	128,779	125,354	98,279	91,830	130,807	142,773	157,845	125,131	105,938	130,543	161,571	5,292,085					
62030	Conference and seminars	1,039	916	999	879	776	1,226	1,186	1,366	1,064	1,068	1,207	1,311	13,857					
62030	Advertising	324	379	348	355	276	462	421	419	367	368	361	479	4,579					
62040	Gifts and donations	38	32	36	35	29	47	42	40	35	29	44	50	467					
63010	Travel	576	628	725	605	536	858	785	858	824	704	791	902	8,568					
63030	Special events	147	133	147	133	82	161	145	147	125	109	148	170	1,586					
64010	Consulting	2,607	2,423	2,644	2,324	2,128	2,861	3,072	3,205	2,390	2,628	2,794	3,848	32,886					
64020	Audit and Accounting	441	492	495	452	377	582	564	565	457	427	512	512	5,938					
64030	Legal	2,435	2,015	2,217	1,970	1,887	2,968	2,642	2,823	2,022	2,211	2,920	2,796	28,471					
64040	Contractual Services	379	344	367	369	345	416	497	447	389	406	394	512	4,880					
64050	Training	25	26	28	25	24	34	32	33	28	24	31	38	348					
65010	Bad Debt Expense	25	26	29	27	22	33	34	35	26	27	33	41	358					
Total Expenses		234,190	240,977	254,891	223,659	188,976	282,688	280,347	313,564	257,118	224,045	273,442	312,870	3,662,337					

Profit & Loss Breakdown - Create Forecast Based on Actual Annualized

Date Desired Net Income: 5000,000

Income/(Expense) by Department	
Administration	3.00%
Finance & Accounting	
Sales & Marketing	
Human Resources	
Professional Services	

Act. Cont. Description Dept.	Actual YTD	Annualized Actual	Adj. Dept./Act.	Act/12 (Est)	What If Scenario	Actual Jan	Actual Feb	Actual Mar	Actual Apr	Actual May	Actual Jun	Actual Jul	Actual Aug	Actual Sep	Forecast Oct	Forecast Nov	Forecast Dec	Total Forecast	
Revenue																			
40010 Product Revenue 300	7,942,344	30,835,616	0.00%	2,538,853		842,780	780,830	782,421	798,718	848,940	1,036,034	998,226	892,867	780,889	1,227,282	1,214,348	1,403,948	12,888,958	
40020 Service Revenue 300	5,099,731	3,889,368	0.00%	6,121,481		436,808	382,799	417,647	381,234	380,392	508,989	490,340	358,882	340,920	603,175	640,123	761,096	6,123,683	
40030 Maintenance Revenue 300	141,818	1,398,393	0.00%	1,114,740		73,834	86,414	78,153	26,918	70,917	302,306	88,778	98,009	54,844	130,178	120,177	318,826	1,114,740	
40040 Other Revenue 300	381,740	121,026	0.00%	549,748		42,274	35,351	38,504	35,894	51,725	46,821	52,394	50,521	53,877	55,340	58,619	47,858	543,789	
Total Revenue	13,745,644	18,295,914	NA	NA	10,095,948	1,417,206	1,290,558	1,317,245	1,256,627	1,458,111	1,736,950	1,677,837	1,606,649	1,303,145	1,886,240	2,057,587	2,172,346	19,885,998	
Cost of Sales																			
50010 COGS - Product Sales 300	2,562,847	3,073,780	0.00%	3,830,751		281,476	245,562	279,768	258,414	231,415	342,420	328,226	246,262	254,515	378,587	411,942	476,264	3,830,751	
Total Cost of Sales	2,562,847	3,073,780	NA	NA	3,830,751	281,476	245,562	279,768	258,414	231,415	342,420	328,226	246,262	254,515	378,587	411,942	476,264	3,830,751	
Profit Margin	11,182,797	15,222,134	NA	NA	6,265,197	1,135,730	1,044,996	1,037,477	998,213	1,226,696	1,394,530	1,349,611	1,360,387	1,048,630	1,507,653	1,645,645	1,696,082	16,055,247	
Profit Margin %	79.9%	79.9%	NA	79.9%	79.9%	80.1%	81.0%	79.4%	79.8%	79.8%	80.0%	79.8%	78.4%	83.5%	79.9%	79.9%	79.9%	79.9%	
Departmental Expenses																			
60010 Full Time - Salary 300	687,467	984,930	3.00%	1,014,478		88,731	72,158	74,542	64,330	65,587	90,015	87,634	86,864	65,175	97,543	126,508	110,898	1,014,478	
60030 Full Time - Commission 300	50,800	80,378	3.00%	81,811		6,055	6,100	5,856	5,239	5,104	7,800	7,421	7,803	5,568	8,508	8,800	30,151	81,811	
60030 Full Time - Bonus 300	180,778	258,999	3.00%	356,798		28,375	18,383	22,127	36,394	13,922	23,369	21,679	21,477	20,868	25,576	18,008	32,307	269,788	
61030 Part Time - Salary 300	74,032	306,300	3.00%	339,247		7,689	8,137	8,847	6,305	6,878	5,034	4,481	5,325	6,827	30,515	11,479	12,230	189,247	
61040 Part Time - Overtime 300	18,424	26,381	3.00%	27,173		1,268	3,892	2,291	1,803	3,634	2,311	2,344	2,306	3,872	2,145	2,853	2,291	27,173	
62050 Part Time - Bonus 300	27,582	30,327	3.00%	42,700		3,001	2,993	2,952	2,588	2,299	3,294	3,855	3,762	3,813	3,318	4,273	4,320	42,700	
61000 Payroll Taxes - FICA 300	110,855	180,180	3.00%	192,804		14,862	16,948	14,939	21,947	11,479	24,100	25,171	28,243	14,728	38,567	29,242	21,860	192,804	
61030 Payroll Taxes - FUTA 300	18,083	25,908	3.00%	26,483		1,884	2,091	2,027	1,807	1,649	2,032	2,167	2,395	1,987	2,568	2,802	1,282	26,483	
61030 Payroll Taxes - SUTA 300	18,151	26,306	3.00%	26,788		1,807	2,091	2,222	1,897	1,649	2,091	2,282	2,419	2,109	2,578	2,812	1,244	26,788	
61030 Payroll Taxes - Workers Comp 300	18,180	26,317	3.00%	26,798		1,828	2,029	2,191	1,796	1,633	2,076	2,187	2,315	2,084	2,579	2,813	1,245	26,798	
61040 Benefits 300	1,798	5,441	3.00%	5,864		988	406	424	544	381	479	483	489	415	789	588	679	5,864	
62010 Marketing 300	1,501,911	2,350,245	3.00%	2,717,840		187,812	385,207	197,279	349,586	175,551	294,580	194,115	292,819	352,888	235,487	252,848	268,985	2,717,840	
62030 Conference and seminars 300	12,817	18,303	3.00%	18,913		1,099	1,248	1,576	1,210	1,059	1,585	1,791	1,853	1,256	1,820	1,586	2,291	18,913	
6208 Advertising 300	4,546	6,227	3.00%	6,413		427	431	484	421	392	393	329	628	442	617	673	777	6,413	
62040 Gift and donations 300	444	630	3.00%	633		44	50	53	44	35	62	60	54	43	63	69	70	633	

Variance Analysis

The calculation of a variance is the difference between the actual expenses and the budget, the actual expenses and the prior-year expenses, or the actual expenses and the forecast. It is recommended that the budget be subtracted from actual expenses for revenue data, but it is the opposite for expenses. The reason for this is that a positive variance is typically good while a negative variance is typically bad. Ask your staff why variances should be calculated and why they should analyze the variances. The first step is to calculate variances and allow departmental managers to enter comments to document the reasons for the variances.

Below are some examples of variance reports. The first report is a comparison against the budget for both month-to-date and year-to-date data. The middle section allows for comments, and conditional formatting is added to quickly highlight variances that should be reviewed. The second report is an exception report that allows the manager to filter out variances over or under a specific percentage so that the largest variances can be reviewed.

Profit and Loss Variance Report

Account Descriptions	September, 2017				September, 2017 Comment Input	YTD Actual	YTD Bud	Variance
	Actual	Bud	Variance	% Variance				
Revenue								
40010 Product Revenue	730,880	744,401	(13,521)	-1.8%	One big project extended with a change order	7,562,564	7,247,727	314,837
40020 Services Revenue	540,925	421,463	119,462	28.3%		4,096,731	4,406,947	(310,216)
40030 Maintenance Revenue	59,664	60,768	(1,104)	-1.8%		745,818	652,557	93,261
40040 Other Revenue	31,677	40,601	(8,924)	-22.0%		363,792	335,236	28,556
Total Revenue	1,363,145	1,267,233	95,912	7.6%		12,768,904	12,642,467	126,437
Cost of Goods Sold								
50010 COGS - Product Sales	254,515	246,880	7,635	3.1%	(2,562,847)	2,489,849	(5,252,696)	
Total COGS	254,515	246,880	7,635	3.1%	(2,562,847)	2,489,849	(5,252,696)	
Gross Profit	1,108,630	1,020,353	88,277	8.7%	15,331,752	9,952,618	5,379,134	
Gross Profit Margin	81.33%	80.52%	0.81%	1.0%	120.07%	78.72%	12645744.00%	
Expenses								
Administration								
Salaries and Benefits	124,724	130,654	(5,930)	-4.5%	1,233,920	124,724	1,109,196	
62010 Marketing	902,096	902,096	0	0.0%	1,502,931	902,096	1,340,845	
62020 Conference and seminars	1,256	1,368	(112)	-8.2%	12,817	1,256	11,561	
62030 Advertising	442	425	17	4.0%	4,346	442	3,904	
62040 Gift and donations	43	41	2	4.9%	444	43	401	
Sales and Marketing	163,827	163,720	107	-0.1%	1,520,538	163,827	1,356,711	
Travel and Entertainment	1,108	1,132	24	2.1%	9,353	1,108	8,245	
Professional Fees	6,949	6,749	200	2.9%	70,409	6,949	63,460	
Bad Debt	36	36	0	0.0%	350	36	314	
Business Insurance	1,581	1,613	32	2.0%	13,647	1,581	12,066	
Office Supplies	1,711	1,585	126	7.9%	15,207	1,711	13,496	
Telephone and Internet	4,065	3,947	118	3.0%	38,486	4,065	34,422	
Rent and Utilities	3,563	3,645	82	2.3%	33,065	3,563	29,502	
Admin Expenses	3,867	3,740	127	3.4%	38,793	3,867	34,925	
Total Administration Expenses	311,431	316,821	(5,390)	-1.7%	2,973,768	249,448	2,218,391	
Finance & Accounting								
Salaries and Benefits	75,166	74,896	270	0.4%	764,371	75,166	689,205	
Sales and Marketing	90,952	90,901	51	0.1%	892,064	90,952	801,112	
Travel and Entertainment	563	585	22	3.7%	5,754	563	5,191	

Control Report - Exception Discovery

Company	Dept	Account Type	Account	Description	September			
					Actual	Budget	Variance	Variance %
U.S.	100	Expenses	67010	Office Supplies	1,074	954	(120)	-11%
U.S.	100	Expenses	61500	Payroll Taxes - FICA	14,723	13,340	(1,383)	-9%
U.S.	100	Expenses	61530	Payroll Taxes - Workers Compensation	2,065	1,899	(166)	-8%
U.S.	100	Expenses	70020	Postage	489	450	(39)	-8%
U.S.	100	Expenses	75010	Taxes	16,826	13,610	(3,216)	-19%
U.S.	200	Expenses	77020	Depreciation - Equipment	355	326	(29)	-8%
U.S.	200	Expenses	68010	Hosting Fees	71	63	(8)	-11%
U.S.	300	Revenues	40040	Other Revenue	31,677	40,601	(8,924)	-28%
U.S.	300	Expenses	66010	Insurance	1,131	1,011	(120)	-11%
U.S.	300	Expenses	76010	Interest	1,033	950	(83)	-8%
U.S.	300	Expenses	67020	Other Supplies	461	388	(73)	-16%
U.S.	300	Expenses	70020	Postage	448	412	(36)	-8%
U.S.	400	Expenses	65010	Bad Debt Expense	12	10	(2)	-13%
U.S.	500	Expenses	62030	Advertising	181	148	(33)	-18%
U.S.	500	Expenses	60030	Full Time - Bonus	7,578	6,588	(990)	-13%
U.S.	500	Expenses	61050	Part Time - Bonus	1,053	891	(162)	-15%
U.S.	500	Expenses	75010	Taxes	6,006	4,749	(1,257)	-21%

There are many ways of showing variances, but the true key is how management is going to create actionable items to prevent or correct the issues. For some, it is an exercise of going through the variance process and documenting the reasons for variances, but if the same meeting happens the next month and the same comments are entered or stated, then there is no reason for the variance analysis. There are many reasons to analyze the variances, such as spotting trends, opportunities, issues, and successes. Variances should be a precursor to a reforecast, which can impact hiring decisions, marketing spending, and strategy changes.

Below are some best-practice recommendations on variance reporting and analysis processes:

- ✓ Provide variance reports to each department manager.
- ✓ The finance department should meet with each department manager to review the variances and discuss any concerns and successes.
- ✓ Create an input form that stores comments for all departmental material variances.
- ✓ Concentrate on the larger variances and discuss with the executive management of the company.
- ✓ Determine if changes need to be made to the strategy and initiatives of the organization.
- ✓ Continually reforecast and make decisions regarding the forecast. Once a forecast is created, then the variance reports should be off of the forecast first and the budget second.
- ✓ Document the action items and review them at the start of the next meeting.

Reporting & Analysis

While historically, reporting and analysis has mostly been a centralized, corporate activity with an executive audience, leading organizations today are “democratizing” information, making relevant ad-hoc analysis, reports and dashboards available near real-time to rank and file employees to empower them to make world-class decisions compared to competitors that lack modern BI technologies and with policies that limit access to much of their data. According to the research covered in Chapter 1, the difference in performance between companies that enable employees with data versus those that don’t is staggering. So, with that in mind, what are the best tools to empower executives, managers and employees with timely, accurate and clear information?

While the prior sections in this chapter focused on forward-looking analytical activities such as strategy, goals, forecasts and budgets, we are now going to look at the critical functions of reporting and analysis. Let us first look at the type of tools or instruments that are available in best-in-class BI solutions so that we know what capabilities we have available to help drive reporting and analysis processes:

Categories of Reporting and Analysis tools

- Report Writers

Report writers are used to create highly formatted statutory and internal reports such as financial statements or operational reports. After decades of evolution, many report writers are still too technical and require IT personnel or experts to design reports, both

because the user needs knowledge of the underlying database tables and because formulas are composed of proprietary syntax that are not common knowledge. This leads to a deep dependency on a few people in the organization, with the result being a lack of desirable reports, which again leads end users to resort to exporting or manually updating spreadsheets. Therefore, leading organizations now generally implement report writers that either are Excel-based or that emulate Excel formulas and formatting, and they train designated business users to create and maintain corporate reports, all with the capability to deliver the finished reports on-demand with interactive filters and refresh in a web-browser environment or by e-mail.

- Ad-Hoc Query Tools

Sometimes also referred to as data discovery tools, as opposed to report writers, this type of reporting technology is not great for highly rigid, formatted reports. Rather, it is designed to let virtually any type of end user create reports on the fly with simple drag and drop functionality. This reduces the need for large numbers of formatted reports to be designed and maintained by power users. It therefore also solves the classical problem that an organization drowns in too many versions of reports that may only have been used once or twice to answer a particular business question and then have been abandoned. With an ad-hoc query tool, users can get answers to their pressing questions and then they either delete the query or save it for reuse later.

- Scorecards

A number of specialized scorecard applications evolved out of the balanced scorecard wave in the early 2000s. However, these applications were too rigid and specialized, just like many organizations found the balanced scorecard methodology, but what has stuck from that era is the focus on key performance indicators (KPIs) and targets. Most companies just use their report writer or dashboards to calculate and present the KPIs, and many have designed a process with both corporate, departmental and individual KPIs that are measured and discussed on a periodical basis. It tends to be a much more efficient and focused way to zoom in on important information, rather than studying lengthy financial or operational reports, where only a few figures are of strong interest.

- Dashboards

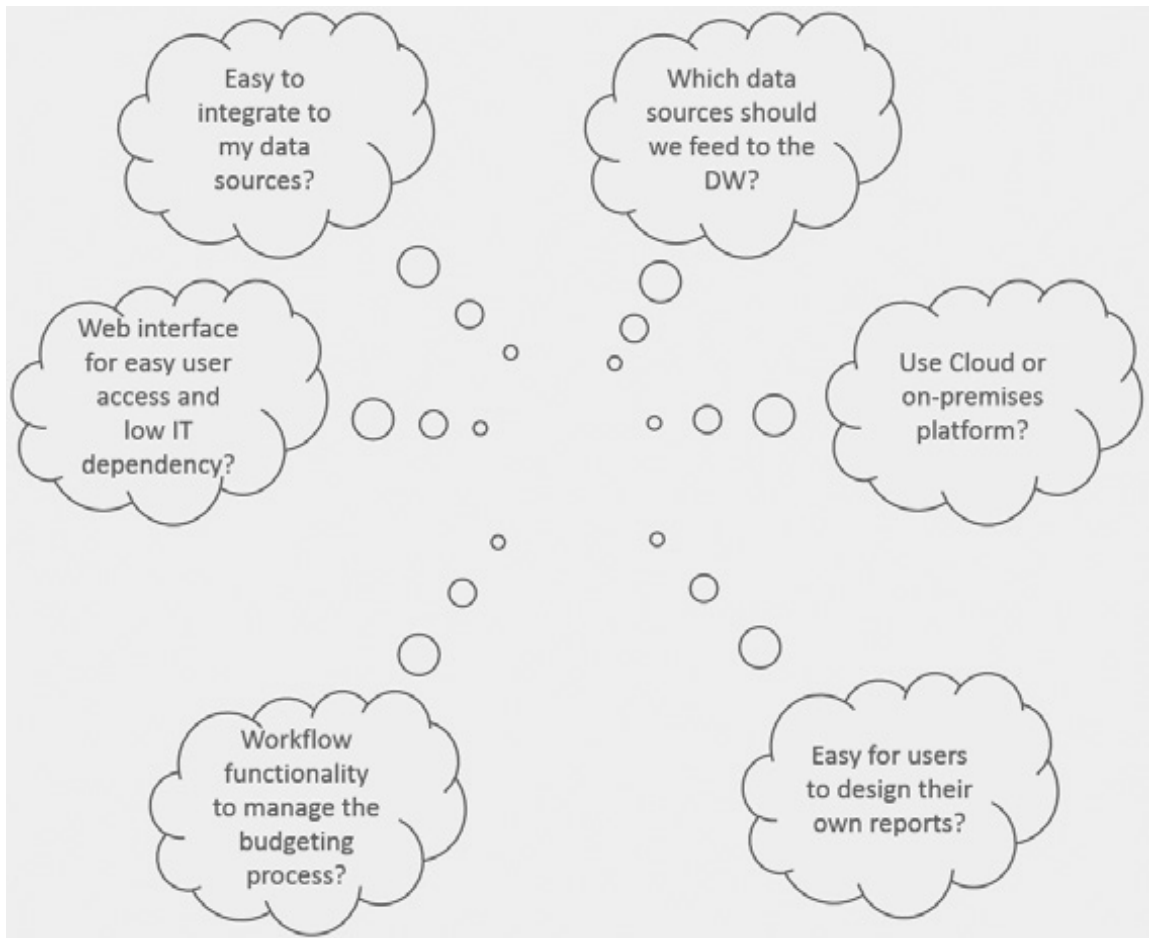
Business dashboards have been around a long time. Early on, they were usually stand-alone applications and they were very rigid and required experts to be designed and maintained. However, modern dashboard technologies are now fully integrated with BI suites that

also offer reporting, ad-hoc queries, budgeting and forecasting, and the dashboards can be designed by business users. A well-designed dashboard makes it easy for a manager to analyze and compare KPIs and other metrics, usually with charts and visual indicators.

- Artificial Intelligence (AI), Internet of Things (IOT), Machine Learning and Data Mining

Most of these technologies are still evolving, and we covered this in Chapter 2. However, modern BI solutions are starting to integrate with these technologies, with the ultimate goal of improving decision-making with better and more automated analysis of internal and external financial, operational and statistical information.

Technology factors that drive world-class reporting and analysis:



An organization's success with a BI solution typically translates into three main categories: 1) Utilization of product functionality, 2) Implementation success, and 3) Employee BI Culture. Below we will discuss core product functionality that a company should look for when evaluating a new BI solution.

- Timeliness as a User Need and Time as a Functionality

Driven by employees' increasing demand for information to support their analysis and decision-making capabilities, it is critical that BI solutions support both timely information and time itself as a dimension. Timely information means that users get the right data at the right time. Some information may be annual or quarterly, like an annual budget or a quarterly forecast, while other information may be monthly, such as financial statements like profit and loss, balance sheet and cash flow reports. Data of a more operational nature such as sales reports and sales pipeline may be weekly, while account journals, inventory reports, etc. may be real time directly from the accounting system database.

When it comes to BI solutions' use of time as a dimension, it defines what detail of information a user can see when he or she looks at a report or drills down to do analysis of underlying data. While monthly and weekly data used to be the lowest time resolution in most BI systems, best-in-class BI solutions today can support any level of detail in data, all the way down to individual transactions from any module in the ERP system or other operational data sources. This ensures that alerts (see next section) have access to all key information, and it also eliminates the need for a user to switch from their BI solution over to their data source system, just to complete their analysis. The latter is very important, as a company that aspires to enable their employees with world-class decision-making needs to provide organization-wide access to the BI solution, and if the same users also needs to be licensed for and learn a transaction source (e.g., an ERP system), it could immediately be cost prohibitive, with increased learning curves and potential access problems.

- On-Demand vs. Push Reporting vs. Alerts

Above, we discussed timeliness of information. In an increasingly fast-paced, competitive climate, it is critical that decision-makers have the right information at their fingertips as soon as it is available. There are three ways that modern BI solutions ensure that this happens: 1) on-demand reporting, 2) push reporting and 3) alerts.

- 1) On-demand reporting and analysis: In the early days of BI, printing and distributing reports was the de facto standard to disseminate information. Today, in the digital age, this has evolved into self-service access for all users, typically through a web browser

interface or a mobile app. This means that an employee can access key information anywhere, anytime on almost any device to consume reports and make decisions.

- 2) Push reporting: While on-demand access is very important, oftentimes an employee is very busy with customers, projects, travel and so on, and it is important that information also can be delivered to them. Typically this occurs by e-mail. Best-in-class BI solutions offer automated e-mail distribution of reports and have features to schedule both the report processing and the distribution. Examples of this are weekly sales and pipeline reports, as well as project status reports. An additional advantage in large organizations is that e-mail distribution of reports typically don't require the purchase of any user licenses of the BI solution.
 - 3) Alerts: Even with on-demand reporting and push-reporting, executives and employees may still be too busy to consume all the information available to them with little time to look for issues or opportunities hidden in that information. This is where *alert* functionality plays an important role. An increasing number of BI suites offer business alerts. This is typically a feature where the user can set up a business rule to have the system send them an e-mail alert if a certain metric breaks the threshold of the rule. An example of this is if sales or inventory levels dips below a pre-specified, critical level. The alert is then sent to the user and he or she can immediately take action without any delays.
- Audit and Control

These features are very important to mid-sized and large organizations in order to trust their key financial and operational data to an enterprise BI solution with users from across the organization. While smaller companies often close their accounting books, including all month-end adjustments, all within their ERP system, larger organizations typically rely on a corporate performance management solution to handle such month-end needs as currency conversion, inter-company eliminations and other adjustments, as well as financial consolidations. Strict audit and control features within the BI solution is therefore critical to ensure “one version of truth,” where figures are an exact match whether reports are coming from the ERP system or the BI solution. Administrative users are typically the only users with access to define and maintain key performance indicators (KPIs) and metadata (organizational roll-up trees, attributes, report definitions, etc.), and in modern BI solutions, these items are therefore centrally maintained and then re-used in reports, dashboards and budget models to simplify design and maintenance of the underlying templates and to ensure high accuracy in reporting.

- Report Management

While world-class organizations have data warehouses that compile and organize all important data so that they can empower users with self-service reporting and analysis, they may have hundreds of users accessing the BI solution every day. Thus, accessing, finding and viewing reports has to be fast and easy. Modern BI solutions enable this with web-based portal interfaces that have features like:

- Report archives to publish, store and retrieve reports.
- Split-screen analysis to compare multiple reports side by side on the screen.
- Search features.
- Favorites/Playlists for users or managers to organize reports and dashboards in various “presentation style” books.
- Workflow for must-read reports, such as month-end reconciliation and control reports.

- Interactivity

A web-based BI portal with easy access to reports, dashboards and budgets is a must have for organizations that want to enable world-class decisions for any user, anywhere at any time; it can also be a huge time saver if the content is interactive. This typically means that users can query and filter the reports and data, drill down to transaction detail from summary figures, and point and click to navigate dashboards.

- Comprehensive Data - ETL and Data Warehousing

It is a known and obvious factor in the world of reporting and analysis that your BI capabilities can only be as good as the data available to the BI tool. Best in class BI solutions therefore provide two essential platform components: 1) a data warehouse where data from virtually any type of data source as well as from the BI tool’s own input forms can be stored in a well-organized and easily retrievable manner and 2) extraction, transformation and loading (ETL) functionality. A modern and powerful ETL tool should not only be relatively easy to configure and use but it should be capable of loading data both from cloud-based data sources and on-premise data sources.

- Actionables (comments, emails, alert)

To help drive world-class decisions in your organization, just providing easy access to powerful reports, analysis and dashboards is not enough. Modern BI solutions should be able to alert users if there is an issue with, e.g., a KPI threshold. For example, if sales of a

particular product dip more than 10% below the same period last year or if the current month's profitability goes below 15% of the budget—or if using predictive functionality—the system should alert you if next month's profitability is likely to be a problem. However, it should not stop there. While alerts or KPI reports can be great ways to quickly and easily detect business issues, the user should then be able to use functionality for ad hoc queries, drill down and trend analysis to find the *how, where, what* and *why* of a problem, and then be able to enter the conclusion and recommended action directly on a relevant report in the BI solution so that other managers can read it and not have to ask a lot of questions or repeat the same analysis themselves. Furthermore, the comments should be saved from the report to the database so that it can be retrieved in comparative reports and for future analysis.

- Easy

The bottom line is that a BI solution can have an incredible amount of functionality and flexibility, but if it is hard to use for the power users that are building most reports and administering the system or the end user interface is clunky so it takes too much navigation to find the relevant information, then it is likely that the system will suffer the fate of many expensive BI deployments; it will end up with a few super users and eventually die a slow death. So, the fact that a new BI solution *must* be easy to use cannot be stressed enough.

- Accessibility

Getting easy access to a BI solution, especially for end users and remote users, is becoming less and less of an issue as modern solutions today provide both web browser interfaces that require no software installation on the end users' computers, as well as access via the internet from anywhere and mobile apps for easy reporting and analysis while the user is on the go. On the other hand, almost all organizations of a certain size in the world use Excel quite a bit for reporting, analysis, budgeting and forecasting, and Excel was never meant to be a multi-user, web- and mobile-friendly BI solution; thus, every time a company has to lean on manual Excel spreadsheets in their budgeting or reporting processes, it reduces their opportunity to enable all users across the organization with world-class decision-making. In summary, the modern BI solution should provide on-demand end-user access through the internet, as well as be able to deliver reports automatically via e-mail.

Examples:

In this final section of the chapter, we will list a number of reports and dashboard examples to provide inspiration for your own BI deployment. Most managers have by now seen most traditional financial and operational dashboards and reports, so in the rest of this chapter we have focused on examples that are somewhat unique or innovative.

Another important factor in order to enable easy and logical analysis is to make sure you set up your BI solution with folders or “playlists,” sometimes referred to as “storyboards,” so that reports and dashboards can be organized in the order that a structured analysis typically takes place. Putting proper thought into the order and content in the logical flow of analysis can be a significant enabler of world-class decisions in a company. Imagine reading a book where chapters do not flow in a logical order versus one where they do. The readers of the properly organized book will walk away with much higher understanding of the subject matter. Now think about a typical company with hundreds of reports, often from different ERP, CRM and data warehouse report writers with different logins and user interfaces and with no logical order or flow to analysis. It is fairly safe to say that the average BI user is far from empowered in this situation, yet it is very common, and the band aid is often manual compilation of the most important data in Excel or PowerPoint presentations, wasting time to find issues and missing the ability to drill down to detail to quickly answer questions.

Now imagine a single web portal accessible from anywhere, with organized playlists for different business areas, starting with big-picture items, then providing reports and dashboards with specific focus areas for detailed analysis of the items that requires attention. For example, for the executive team, the “corporate playlist” could be organized with reports and dashboards in this order:

- 1) Exception Report

The core purpose of this type of report is to quickly give attention to any business issue as represented by a KPI. A key feature is to only show KPIs where a given threshold is breached so that managers quickly can address problems and opportunities. A number of BI tools can also automatically distribute this as an “alert report” so that users don’t need to repetitively log in to a system to look for exceptions.

- 2) KPI Report

This report provides a structured list of *all* the KPIs for a business unit so they can easily monitor these metrics and then, using supporting dashboards and reports such as the examples listed below, deep dive into any KPI of interest for further analysis. There should also be a comment ability in this KPI report so the user can enter the findings (reason for

issue and suggested action) and thereby easily enable their peers to see the commentary whenever needed.

3) Dashboard for KPI 1

This first dashboard follows the KPI report, and the goal is to show graphical analysis with comparative and trend analysis for the first KPI (KPI 1) in the KPI report (see above).

4) Financial Statement or Operational Report for KPI 1

This would be the first detailed report, such as a financial statement or a sales report, and the goal of the report is to provide numerical analysis for the first KPI 1, with drill down to the underlying transactions.

5) Dashboard for KPI 2

This second dashboard follows the KPI report, and the goal is to show graphical analysis with comparative and trend analysis for KPI 2 in the KPI report (see above).

6) Financial statement or Operational Report for KPI 2

This would be the second detailed report, such as a financial statement or a sales report, and the goal of the report is to provide numerical analysis for KPI 2, with drill down to the underlying transactions.

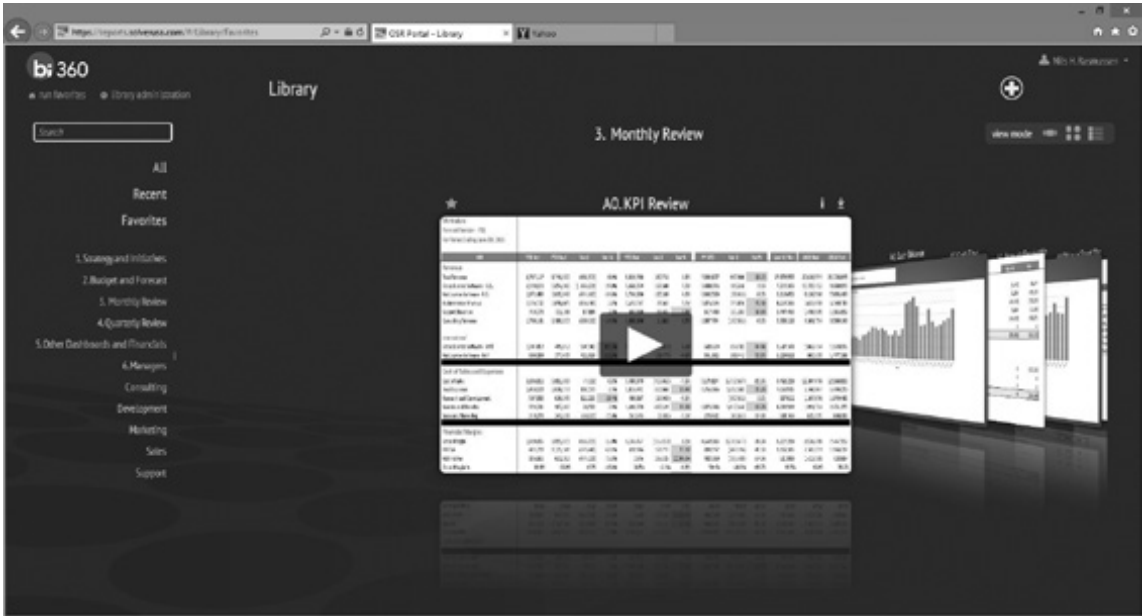
7) Dashboard for KPI 3 (and so on)

This third dashboard follows the KPI report, and the goal is to show graphical analysis with comparative and trend analysis for KPI 3 in the KPI report (see above).

8) Financial Statement or Operational Report for KPI 3 (and so on)

This would be the third detailed report, such as a financial statement or a sales report, and the goal of the report is to provide numerical analysis for KPI 3, with drill down to the underlying transactions.

Here is an example of a BI portal with reports and dashboards organized similarly to how it is described above:



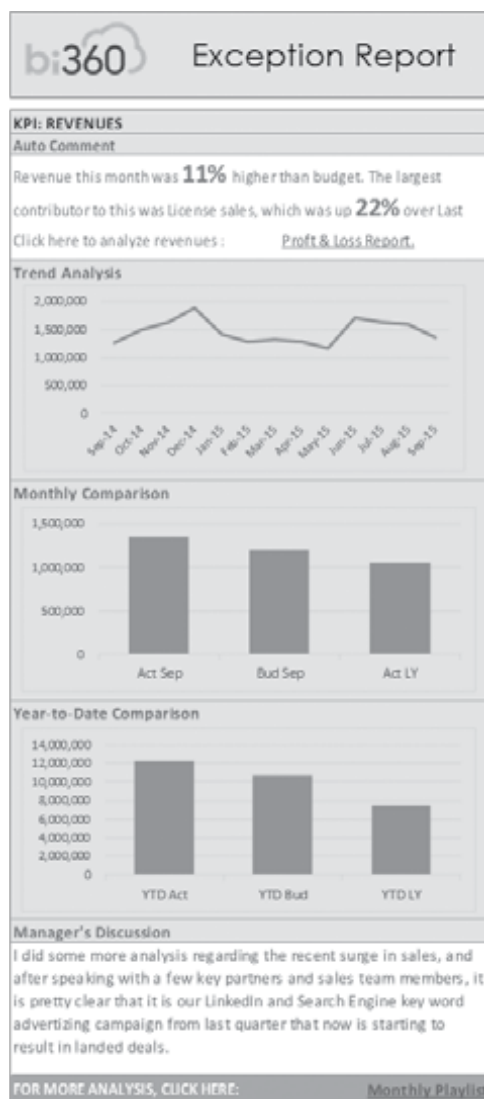
And of course, a user should also be able to navigate the BI portal based on their ad-hoc analysis needs without following the suggested structure above.

The following are examples of different types of reports and dashboards that may provide you with content ideas for your own BI playlists. Note: Instead of focusing on very typical financial statements and dashboards, the goal on the following pages is to provide ideas and examples that you may not already have in mind. First, we will look at some examples at the corporate level and then we will look at a set of operational-level examples for a department:

Corporate Examples

- KPI Exception Report

The idea behind this type of report is that busy executives don't have to remember to log in to a BI solution to actively monitor their most important metrics to look for problems that quickly need their attention. Instead, they use the BI solution to monitor their KPIs and they decide which threshold each KPI should have in order to be triggered on, e.g., a daily exception report that is automatically emailed to them. If any KPIs they monitor are owned by another manager, this manager may already have entered an explanation for the variance that is now visible in the KPI exception report (see bottom of example below).



- KPI Report with Comments

While many organizations have a rich set of reports to provide information to managers, it is often too much information and too little focus on what really matters. This is where KPIs come in. If they are carefully chosen based on each internal audience, they provide a quick way to monitor if each business area is performing well or not. If something important is found in a KPI, it adds a lot of incremental value if the BI solution allows the manager to enter their comment. This comment can then be surfaced in other reports as well, such as shown in the example above and in the comment analysis example shown later in this section.

Trend		September 2015				Variance Comment	August 2015	
		Actual	2014 Actual	Bud	% Var	(This comment is stored to the database)	Actual	% Var
INCOME STATEMENT METRICS								
Product Revenues		730,880	727,797	744,401	98.2%		892,347	122.1%
Services		540,925	422,346	421,463	128.3%		559,682	103.5%
Other/Maintenance		91,341	121,215	101,369	90.1%		148,620	162.7%
Revenue		1,363,145	1,271,357	1,267,233	107.6%		1,600,649	117.4%
Expenses		8,996,417	980,306	8,648,634	104.0%	Due to unexpected hiring of 2 new FTEs	8,066,063	89.7%
Other Expenses		89,671	89,731	84,107	106.6%		106,850	119.2%
Net income [\$]		(7,633,272)	201,320	(7,465,508)	102.2%		(6,572,263)	86.1%
Net income [%]		-560.0%	15.8%	-589.1%	95.1%		-410.6%	73.3%
Return on Assets (ROA)		-731.5%	27.9%	0.0%	0.0%		-632.6%	86.5%
BALANCE SHEET METRICS								
Cash		1,027,218	1,027,218	654,000	157.1%	Due to cancelled LOC.	941,941	91.7%
Current Ratio		2.68	2.68	0.00	0.0%		2.55	95.0%
Accounts Receivable (Current)		151,845	151,845	160,000	94.9%		149,989	98.8%
Accounts Payable (Current)		117,473	117,473		0.0%		115,444	98.3%
Debt to Equity		0.19	0.19	0.00	0.0%		0.20	108.1%
Debt to Assets		0.84	0.84	0.00	0.0%		0.84	100.0%
STATISTICAL METRICS								
Employee Headcount		78	73	76	102.5%		78	100.0%
Avg Revenue per Day		19,199	0	1,906	1007.5%	We budgeted way to low on this.	22,544	117.4%
Gross Revenue/Headcount		17,476	17,416	16,652	104.9%		20,521	117.4%


- PL with Comment Analysis

This is a rare report to see in a company because most organizations don't have BI tools that can save report comments to a database, but it can be very high value. Let us say that a company has a requirement that all actual to budget variances bigger than 10% have to be explained by the responsible manager entering a comment on the report. Later, it is then interesting to have a report that "scoops" up all comments across all departments, as these likely represents important business issues. However, after some months or a year, a second analytical opportunity also presents itself; it becomes interesting to analyze if any issues are recurring problems that have not been fixed, where month after month a manager states that the same problem exists. Below is an example of such a report.

Profit and Loss Variance Report					b:360			
Corporate US					SUS			
Account Descriptions	September, 2015		September, 2015		September, 2015	August, 2015	July, 2015	
	Actual	Bud	Variance	% Variance	Comment Input	Comment Input	Comment Input	
Revenue								
40000 Product Revenue	790,880	744,401	(73,521)	-1.8%	No more staff additions. Will reforecast.	Added 1 more person not in budget	Added 5 more services personnel	
40020 Services Revenue	540,925	421,463	129,462	28.3%				
40090 Maintenance Revenue	59,664	60,798	(1,134)	-1.8%				
40040 Other Revenue	31,677	40,601	(8,924)	-22.0%				
Total Revenue	1,961,146	1,267,238	693,908	7.6%				
Cost of Goods Sold								
30000 COGS - Product Sales	279,372	246,896	32,476	13.2%	Same as prior month. Remember this for budget	Higher gas prices still an issue	High inventory cost due to higher trsp prices	
Total COGS	279,372	246,896	32,476	13.2%				
Gross Profit	1,681,773	1,020,342	661,431	6.2%				
Gross Profit Margin	29.51%	80.52%	-1.01%	-1.4%				
Expenses								
Administration								
60000 Full Time - Salary	60,375	72,751	7,376	10.4%	Due to the additional hires in Aug/Sep			
60020 Full Time - Commission	5,248	4,952	(304)	-6.4%				
60090 Full Time - Bonus	20,068	20,670	602	2.9%				
61000 Part Time - Salary	8,027	7,947	(80)	-1.0%				
61040 Part Time - Overtime	1,872	1,741	(131)	-7.5%				
61060 Part Time - Bonus	8,515	2,892	(5,623)	-6.2%				
61500 Payroll Taxes - FICA	13,902	13,940	(38)	-0.3%				
61510 Payroll Taxes - FUTA	1	2,087	(2,086)	-0.0%				
61520 Payroll Taxes - SUTA	2,300	1,985	(315)	-15.9%				
61530 Payroll Taxes - Workers Comp.	2,065	1,899	(166)	-8.7%				
61540 Benefits	423	420	(3)	-0.7%				
Salaries and Benefits	121,916	139,654	17,738	13.3%				

- Executive Briefing Card


The executive briefing card is an example of a report designed to provide all pertinent information for a certain type of manager (executive, sales, services, etc.) on a single page and in a very easily readable format. The example below shows a combination of automatically generated text summary, mini reports, charts, links to more detailed reports, etc.




CORPORATE FACTS

Headcount	Sep-15	Sep-14
Actual	78.0	73.0
Budget	76.1	72.3

REVENUE TRENDS



PROFIT TRENDS



Executive Briefing Card

Performance Summary for September, 2015

Sales are up this month, with a \$91,788 increase against the same month last year. Net Income has decreased with 243.9% over last year with profits of \$88,605 vs. -\$61,557 last year. The largest contributor to revenues is Product Sales at \$7,562,564, followed by Services at \$4,096,731.

Profit & Loss Summary

In Millions	Current Month					Year-to-Date				
	Act	Act LY	Var	Bud	Var	Act	Act LY	Var	Bud	Var
Revenues	1.36	1.27	0.09	1.27	0.10	12.77	11.56	1.21	12.64	0.13
Profit Margin	1.11	1.01	0.10	1.02	0.09	10.21	9.17	1.03	9.95	0.25
Profit Margin %	0.0%	0.0%	0%	0.0%	0%	0.0%	0.0%	0%	0.0%	0%
Net Income	0.09	(0.05)	0.15	0.01	0.08	0.36	(0.08)	0.44	0.47	(0.11)

Do you have comments to the P&L or need the same report for other months? Log on to Insight: [Here](#)

Balance Sheet Summary

	Monthly Change			Current Balance		
	Act	Act LY	Var	Act	Act LY	Var
Cash	0.00	(0.00)	0.15	1.74	0.60	1.14

- CFO Dashboard

This is an example of a dashboard tailored to a specific role, in this case the CFO. It contains a summary of key financial information related to revenues, liquidity, payables and receivables. Some of the most powerful dashboards have a specific focus that either support the responsibilities of a person or they provide an in-depth focus on a specific business area such as products, customers, projects, etc.



- Benchmark Dashboard

One thing is to have great BI focused on the performance of your own organization, but just as important can be to monitor your business performance as compared to that of competitors or industry averages, when available. The example below shows a benchmark dashboard.



- General Ledger Exception Report

While almost all organizations have a core set of financial statements to monitor and analyze assets, liabilities, revenues, expenses and cash flow for different business units, they often don't have any easy way to see only significant actual to budget variances. The example below produces all variances above a certain threshold and across all departments and subsidiaries in a single report. In other words, it is a very quick way for executives to find important issues across the entire organization.

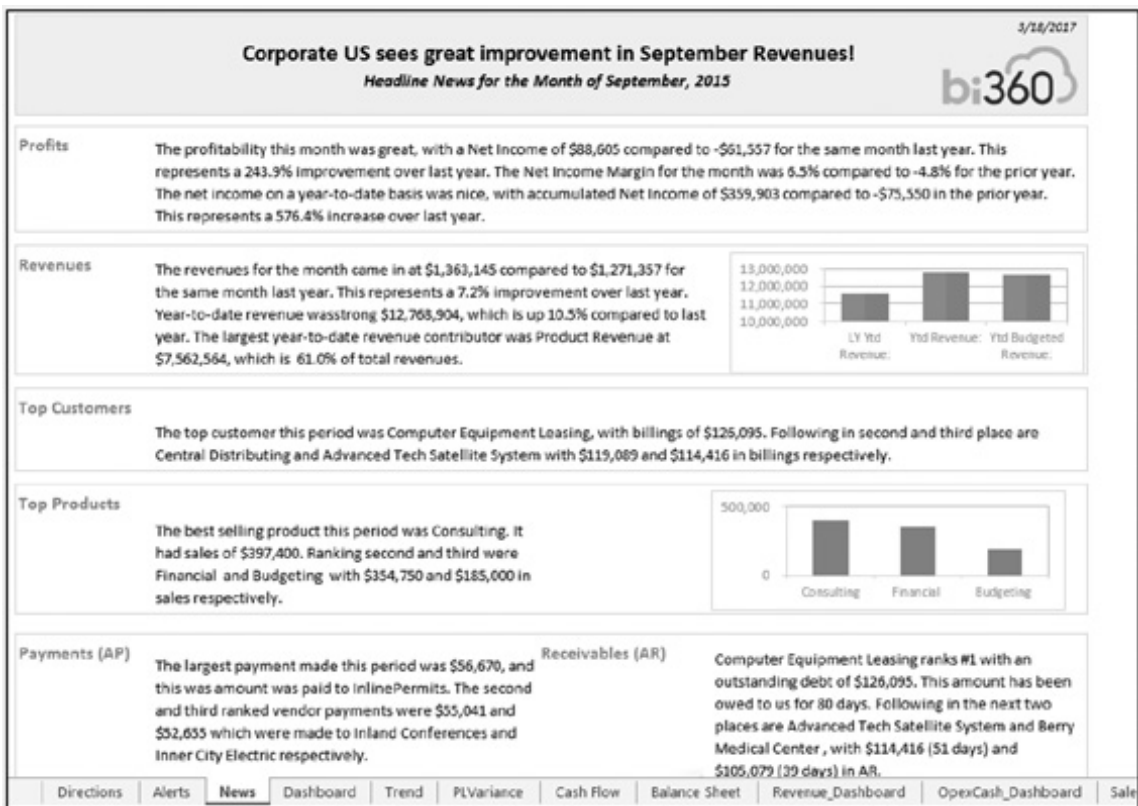
bi360 FR32 - General Ledger Exception Report.xlsx

Control Report - Exception Discovery

					March, 2012			
Company	Dept	Account Ty	Account	Description	Actual	Budget	Variance	Variance %
SAS	300	Revenues	40030	Maintenance Revenue	309,700	303,000	6,700	2%
SAS	300	Revenues	40040	Other Revenue	151,800	150,000	1,800	1%
SAS	300	Revenues	40010	Product Revenue	2,377,800	2,500,000	(122,200)	-5%
SAS	300	Revenues	40020	Service Revenue	1,602,300	1,700,000	(97,700)	-6%
SAS	300	Expenses	68120	Advertising	1,200	1,243	43	4%
SAS	300	Expenses	68190	Bad Debt Expense	42,400	42,400	0	0%
SAS	300	Expenses	68150	Bank charges	600	700	100	17%
SAS	300	Expenses	68050	Conference and seminars	1,700	1,450	(250)	-15%
SAS	300	Expenses	63000	Consulting	5,200	5,400	200	4%
SAS	300	Expenses	63040	Contractual Services	61,800	58,000	(3,800)	-6%
SAS	300	Expenses	66010	Depreciation - Building	74,300	45,320	(28,980)	-39%
SAS	300	Expenses	66040	Depreciation - Computer	600	400	(200)	-33%
SAS	300	Expenses	66030	Depreciation - Equipment	22,900	23,400	500	2%
SAS	300	Expenses	68060	Dues, Licenses and Permits	4,200	5,000	800	19%
SAS	300	Expenses	61540	Educational Reimbursement	600	600	0	0%
SAS	300	Expenses	64030	Electricity	20,800	19,000	(1,800)	-9%
SAS	300	Expenses	63050	Equipment Lease and Rental	1,800	1,800	0	0%
SAS	300	Expenses	60030	Full Time - Bonuses	13,800	17,393	3,593	26%
SAS	300	Expenses	60500	Full Time - FICA	40,600	40,000	(600)	-1%
SAS	300	Expenses	60510	Full Time - FUTA	40,800	40,000	(800)	-2%
SAS	300	Expenses	60020	Full Time - Overtime	1,200	900	(300)	-25%
SAS	300	Expenses	60010	Full Time - Salaries	423,600	416,000	(7,600)	-2%
SAS	300	Expenses	60520	Full Time - SUTA	12,100	12,100	0	0%
SAS	300	Expenses	60530	Full Time - Workers Compensation	15,600	15,600	0	0%
SAS	300	Expenses	68130	Gift and donations	600	600	0	0%
SAS	300	Expenses	65010	Insurance	1,200	1,200	0	0%

- DecisionPack

Oftentimes, managers are busy or they don't have the time, the means or the skills to quickly and easily analyze all important areas for their business unit. In other words, it would help them significantly if they, either by email or within a BI portal, could be presented with all important reports and graphics within a single workbook or presentation. In the example below, appropriately named "DecisionPack," each tab is a report within the self-contained workbook, starting with an automated narrative summary, followed by reports with KPIs, financial statements, charts and supporting sales, payables and receivables. Some CPM solutions can produce these automatically as workbooks in Excel or as storyboards or playlists within web portals.

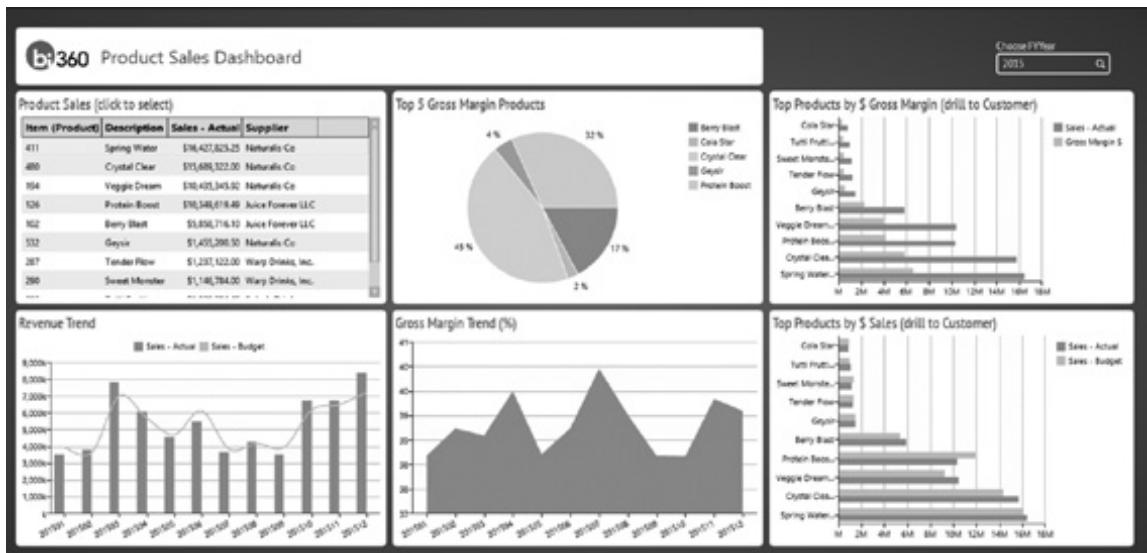


Departmental Examples

Each department in a company has their own unique focus, such as accounting, sales, services, production, IT, and so on. A modern BI solution should provide each of them with their own tailored set of reports, dashboards and planning templates to optimize their decision-making abilities. When organized in the same BI portal as the corporate-level content (refer to examples in the prior section), these departmental-level templates also provide corporate managers with an opportunity to “drill down” into very detailed information to improve the communication and understanding of their individual operational areas. Below are various examples to provide you with some ideas.

- Departmental Dashboard – Product Sales

This is a typical example of a dashboard that targets a single area, such as sales, and within sales it specifically provides a product point of view. The vast majority of BI tools offer interactive dashboards so the user can drill down and filter out any information seen on the screen.



- Transaction report – Product Sales

While transaction reports exist in all ERP systems to review and analyze detailed data, this type of report is particularly powerful within a BI solution and when tied to a KPI report or a dashboard, such as in the prior example. It allows the manager to save time and their company to save software licenses by allowing the manager to stay within the BI portal for all the information they need without having to switch over to, e.g., an ERP system to do transaction-level analysis or, even worse, to have to stop their analysis in order to request this information from the accounting department.



Sales by Product Class

US Distribution Co.

Product Description	December, 2015				Jan-15 Actual	Feb-15 Actual	Mar-15 Actual	Apr-15 Actual
	Actual	Last Year	Variance	Var (%)				
Juices								
Berry Blast	760,121	897,491	(137,370)	-15%	405,152	422,741	617,691	450,000
Protein Boost	1,282,944	1,229,446	53,498	4%	346,964	504,251	1,366,525	997,000
Veggie Dream	1,229,532	1,182,730	46,803	4%	538,012	824,868	1,601,437	1,229,000
Soft Drinks								
Cola Star	126,639	153,922	(27,283)	-18%	36,228	50,074	87,033	72,000
Sweet Monster	125,408	156,946	(31,538)	-20%	101,894	75,418	124,992	94,000
Tender Flow	138,138	154,944	(16,806)	-11%	132,748	91,915	130,572	94,000
Tutti Frutti	118,772	148,971	(30,199)	-20%	54,234	70,891	148,408	116,000
Water								
Crystal Clear	2,360,160	2,003,889	356,271	18%	1,159,488	712,932	1,473,120	1,159,000
Geysir	166,963	226,885	(59,923)	-26%	146,034	79,297	174,933	130,000
Spring Water	2,042,475	1,969,576	72,899	4%	595,391	946,648	2,084,409	1,720,000
Total Revenue	8,351,152	8,124,799	226,353	3%	3,516,145	3,779,034	7,809,121	6,065,000



- Operational P&L Based on Allocations

Profitability is one of the most common and typical metrics tracked in a company. However, while all companies produce corporate-level profit and loss reports with relative ease, it typically requires a lot more work to provide profitability by, e.g., product, customer or project, yet it is incredibly important to know whether you are making or losing money in these areas. The reason is that most companies don't book all or any of their expenses by business area. In other words, in order to get to, e.g., gross margin or net profit, they often have to perform complex allocations of the expenses that should be assigned to each area of operation. Good BI tools can deliver advanced allocations automatically based on rules, and then you can produce profitability reports such as the one below.

Product Profitability Report

Corporate US



Acct Code	Account Description	Pre-Alloc Total	Product A	Product B	Product C
Revenue					
40010	Product Revenue	9,767,792	2,930,337	4,395,506	2,441,948
40020	Services Revenue	6,563,101	1,968,930	2,953,395	1,640,775
40030	Maintenance Revenue	858,019	257,406	386,109	214,505
40040	Other Revenue	469,189	140,757	211,135	117,297
	Total Revenue	17,658,101	5,297,430	7,946,145	4,414,525
Cost of Sales					
50010	COGS - Product Sales	3,496,981	1,049,094	1,573,642	874,245
	Total Cost of Sales	3,496,981	1,049,094	1,573,642	874,245
	Profit Margin	6,270,810	1,881,243	2,821,865	1,567,703
	Profit Margin %	0.0%	0.0%	0.0%	0.0%
Expenses					
50010	Salaries and Benefits	5,085,155	1,525,546	2,288,320	1,271,289
50020	Sales and Marketing	6,086,219	1,825,866	2,738,799	1,521,555
55010	Travel and Entertainment	50,608	15,183	22,774	12,652
56020	Professional Fees	287,167	86,150	129,225	71,792
56035	Bad Debt	1,419	426	639	355
56780	Business Insurance	58,291	17,487	26,231	14,573
59340	Office Supplies	58,429	17,529	26,293	14,607
59600	Telephone and Internet	158,230	47,469	71,204	39,558
61010	Rent and Utilities	132,118	39,635	59,453	33,030
62040	Admin Expenses	158,106	47,432	71,148	39,527

- Cross Drill Transaction Reports

While it is very powerful for any information worker to have a mix of KPIs, dashboards and reports easily available within the same BI tool, sometimes, due to time, skills and access rights, analysis becomes amputated because it stops with a transaction report. But let's say that an employee found an inventory issue in a KPI, then analyzed the trend in a dashboard and moved on to look at individual quantities available by product in an inventory report. However, while finding that there are too many orders to fulfill vs. available inventory for a certain item, the person now needs to see which customers have ordered this item so a decision can be made on which orders to fulfill first (note, the Customer360 report example later in this section can further help to decide which customers to serve first in this situation). Modern CPM tools allow for a cross drill, so in this example, the user can drill from a line item on the inventory report and over to a sales order report to see which specific customers ordered the different quantities.


The screenshot shows the b:360 Inventory Report interface. The main table displays inventory data for various items, including Berry Blast and Protein Boost. A tooltip window titled "Drill-To Sales Orders - Drilldown" is open, showing a list of sales orders with columns for Customer, Description, Qty, Payment Terms, Item/Product, Date, Quantity, Unit Price, and Extended Price.

Center	Item Code	Item Description	Item Class	Supplier	Inventory Value	Qty On Hand	Customer Orders	Qty Available	Min/Max OK?	Inv - Min Notifier	30 day Forecast
100	102	Berry Blast	Juices	Juice Forever LLC	\$ 4,400	98	78	20	OK	19.6	203
110	102	Berry Blast	Juices	Juice Forever LLC	\$ 5,050	122	110	12	OK	12.2	287
130	102	Berry Blast	Juices	Juice Forever LLC	\$ 5,100	113	91	23	OK	22.7	236
150	102	Berry Blast	Juices	Juice Forever LLC	\$ 4,900	109	125	(16)	Low	-16.3	152
160	102	Berry Blast	Juices	Juice Forever LLC	\$ 4,900	109	125	(16)	Low	-16.3	152
170	102	Berry Blast	Juices	Juice Forever LLC	\$ 5,350	122	141	(18)	Low	-18.4	171
180	102	Berry Blast	Juices	Juice Forever LLC	\$ 5,500	118	136	(18)	Low	-17.7	165
190	102	Berry Blast	Juices	Juice Forever LLC	\$ 4,500	120	138	(18)	Low	-18.0	168
100	126	Protein Boost	Juices	Juice Forever LLC	\$ 4,800	107	64	43	OK	42.7	166
130	126	Protein Boost	Juices	Juice Forever LLC	\$ 6,417	143	86	57	OK	57.0	222
180	126	Protein Boost	Juices	Juice Forever LLC	\$ 5,452	121	73	48	OK	48.5	189
190	126	Protein Boost	Juices	Juice Forever LLC	\$ 5,600	126	143	(19)	Low	-18.7	174
100	126	Protein Boost	Juices	Juice Forever LLC	\$ 4,800	107	123	(16)	Low	-16.0	149
210	126	Protein Boost	Juices	Juice Forever LLC	\$ 6,417	143	164	(21)	Low	-21.4	200
220	126	Protein Boost	Juices	Juice Forever LLC	\$ 5,452	121	139	(18)	Low	-18.2	170
230	126	Protein Boost	Juices	Juice Forever LLC	\$ 4,800	107	123	(16)	Low	-16.0	149
Total								26			2,955

Customer	Description	Qty	Payment Terms	Item/Product	Date	Quantity	Unit Price	Extended Price
AARON001	Aaron RZ Electrical	30	NET 30	5/1,0016	41.00	1248	1800.00	
SPH0001	St Mary Hospital	90	NET 30	5/1,0016	21.00	4762	5880.00	
ACT0000	Acton Sales	45	NET 30	5/1,0016	14.00	6429	7800.00	

- Transaction Report with Drill to Scanned Invoice


An increasing number of companies are going paperless in many areas of their operations. This typically includes acquiring a document management system that can manage scanning and filing of receipts and invoices and tie them back to the ERP system. From a BI perspective, these scanned documents often contain detailed information not booked in the ERP system, and they can help users save time and improve analysis by eliminating dependency on their accounting department to find and access scanned documents. In the example below, you see an accounts receivable report with hyperlinks that allow the end user to easily drill from the report and down into the image of the original invoice.



Accounts Receivable Report
Corporate US
September, 2015

10/16/16 11:16 PM

Customer Description	Link to Invoice From BI360	Link to Invoice Smart Name	Sales Person	Document ID	Document Date	Amount
				11080	09/07/15	(7,450.00)
Aaron Fitz Electrical						
		BI360 Link to Invoice		10080	09/03/15	114,415.53
Advanced Tech Satellite System						
		Smart Link to Invoice		19850	09/20/15	(4,850.00)
Aiton Manufacturing						
		BI360 Link to Invoice		Smart Link to Invoice		
Associated Insurance Company						
Astor Suites						
		BI360 Link to Invoice		Smart Link to Invoice		
Berry Medical Center						
Blue Yonder Airlines						
		BI360 Link to Invoice		Smart Link to Invoice		
Castle Inn Resort						
Cellular Express						
		BI360 Link to Invoice		Smart Link to Invoice		
Central Distributina						



Invoice No. 10080

INVOICE

Customer		Bill To	
Name	Advanced Tech Satellite System	Name	
Address	444 Main Street	Date	09/03/2015
City	Milford, NJ 08006	Due	Upon receipt

Qty	Description	Unit Price	TOTAL
4	Budgeting and Forecasting Product	\$ 7,500.00	\$ 45,000.00
1	Customizations	\$ 87,126.00	\$ 87,126.00
4	Desktop and Services Product	\$ 4,000.00	\$ 16,000.00
1	Deep Warehouse Product	\$ 26,000.00	\$ 26,000.00
4	Financial Reporting Product	\$ 3,500.00	\$ 14,000.00

Sub Total \$ 188,126.00

Tax Rate(s) 0.00% \$ -

TOTAL \$ 188,126.00

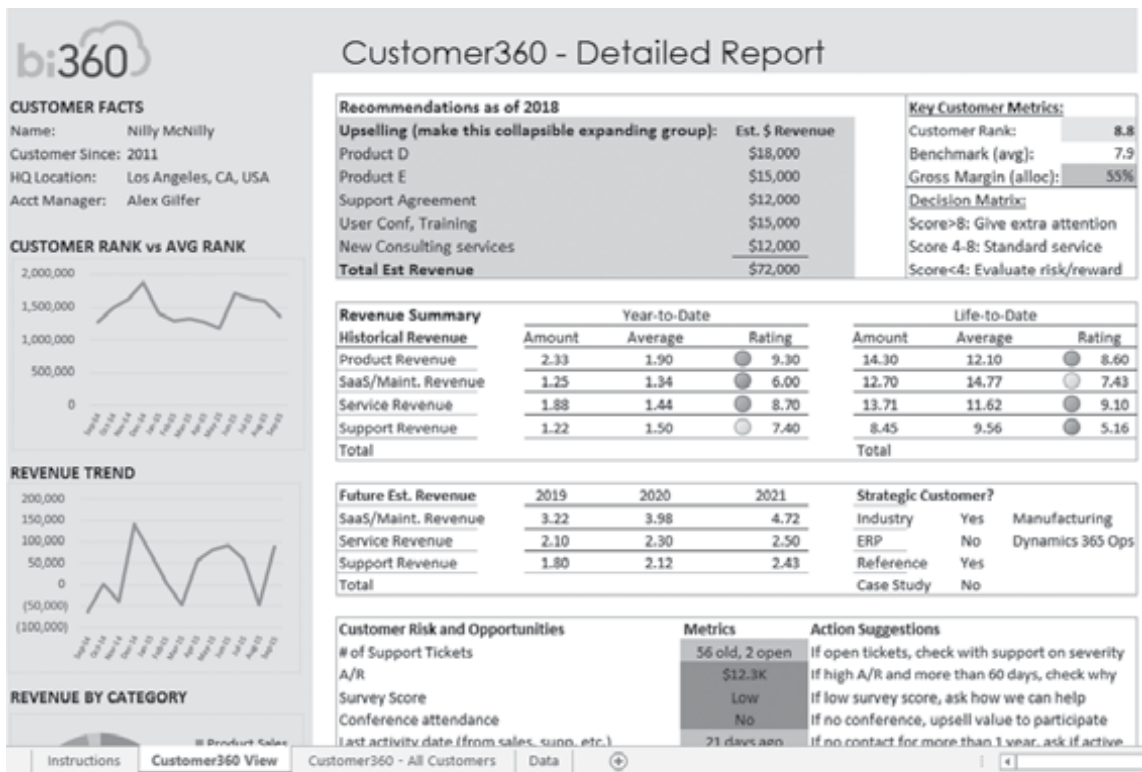
Bank Info

Union Bank of California
13861 San Vicente Blvd
Los Angeles, CA 90049

We can accept your company check or wire

- Customer360 Reports

In the example below, the “Customer360” name refers to a type of report that provides a 360 degree view of a customer. As organizations automate their administrative and operational processes with different cloud or on premise systems, there is an increasing amount of data available for important areas such as customers, products, sales people and so on. The ultimate enabler for world-class decisions is to have all this disparate information collected into a single database, typically a data warehouse supporting a BI solution, and then produce a single report. This report should not only provide the key information about, e.g., a specific customer, but it should also be able to weigh all the data points (such as sales, AR, ongoing support, etc.) and produce a single score so that all the customers can be rated from best to worst. Below, you can see an example of such a report. It includes a drill down to a transaction report that ranks this customer with all other customers.



Customer360 - All Customers

Acct Manager	Cont #	Customer Name	City	State	Country	YTD Revenue	Life Revenue	Revenue Potential	Gross Margin (%)	AR Aging	AR Days	Rank	Risk	Case Study
Alex Gilfer	12712	Stafers, Inc.	New York	NY	USA	\$ 45,938	\$ 118,010	\$ 220,070	45%	\$ 12,574	96	9.3	Low	Yes
Tracy Hill	983	Talbot and Company	Chicago	IL	USA	\$ 35,740	\$ 245,820	\$ 495,440	33%	\$ 141	140	9.0	Low	No
Anastasia Spive	1439	Lilly Software	Seattle	WA	USA	\$ 49,323	\$ 16,244	\$ 126,488	44%	\$ 28,333	22	8.8	Low	No
Gabriela Huckstar	11389	Dream4 All	Seattle	WA	USA	\$ 21,833	\$ 41,982	\$ 81,964	22%	\$ 1,764	22	8.7	Low	Yes

Readiness Checklist

Item	Your Score (1 Lowest – 10 Best)	Notes
Decide who the users of the BI system will be and their responsibilities		
Decide which information and metrics are important for the corporate team and departments		
Decide which information to collect in budgets and forecasts		
Decide which information to present in KPI reports, formatted reports and dashboards		
Create storyboard/playlist for each department and the corporate team		
Mock up layout (e.g. in Excel) for all the templates prior to implementation		
Total		

Chapter 7

Software Selection

“Organizations who win, think deeply, choose wisely, and act decisively.”

–Mark Miller

Purpose

We are constantly making decisions and choices for our organization. We often use a mix of research, good judgment and experience to make the choices we feel are best for the given situation. In some situations, these decisions often result in success and other times not. Unlike picking the wrong coffee machine for your office, the consequences of selecting the wrong enterprise software package are much greater. In this chapter we will cover some of the most common features found in modern BI and CPM solutions, which help organizations become world-class decision-makers. This information will help solidify your road to selecting and deploying a modern corporate performance management solution.

In Chapter 5, you learned the important business areas to focus on when developing your CPM blueprint. The next step is to transpose that knowledge into product capabilities and features. While this chapter will focus on product capabilities, it is important to keep in mind that while the features help facilitate world-class decision-making, you should first formalize your complete BI vision.

Functionality

Once you have started to understand your organization’s business processes and needs, it’s time to dig in and narrow down the features. It’s a good idea to start with the major themes within your CPM blueprint. Start with the critical “must haves” and work down the list to the nice to haves. As you work through the list of features from different CPM vendors, you are likely to discover new features and functionality, which may help support your vision. It is also important

to keep in mind that some features may be conceptually great but are not aligned with your organization's short- or long-term priorities. The following list covers common capabilities found in most CPM solutions.

Primary components of a CPM platform:

- Reporting (Financial and Operational)
- Consolidations & Close Processes
- Budgeting & Forecasting (Financial and Operational)
- Ad-hoc Analysis (Data Discovery)
- Dashboards/Storyboards/KPIs
- Business Data Warehouse
- Data Integrations (ETL: Extract-Transform-Load)

REPORTING

Chances are, your organization already does all kinds of reporting. In talking with department heads, you probably found that staff are commonly using a mix of Excel, internal application reports and reports generated by IT. Formatted reporting is the key component of a modern CPM suite. Depending on your organization's industry and needs, formatted reporting may cover daily, weekly, monthly, quarterly or other grains of time. Formatted reports are typically used to assess the organization's performance with a specific format, controlled by power users helping design the reports. Unlike ad-hoc reporting, formatted reports are often the key reporting deck used to monitor the health of the organization. Below is a list of some of the key reporting features; a full list is available within the appendix.

- ***Design experience:*** You may find that reports from different vendors all appear exactly the same; rest assured, they are not. Super easy drag-and-drop experiences may result in loss of complex capabilities you may need. Very robust tools with many configuration options with lots of bells and whistles may suffer from a steep learning curve and still not meet your requirements. Because Excel is the most popular and well-known application in the finance and accounting world, a report designer experience that is similar to Excel or is Excel, may offer advantages over other design experiences. Ask vendors to show you a simple report design from start to finish and then also ask them to walk you through the design of a very complex report example. Keep in mind that modern BI tools are built to empower business power users to design reports.

- **Business friendly:** Power users should not be database developers; they are typically business users in finance, accounting or other departments who help own the business intelligence tools on the business side of the office. Modern BI and CPM solutions typically offer an abstraction of data from the underlying database tables. Abstraction is often also referred to as metadata because it is a layer that defines the underlying data. For instance, in many accounting systems, the data may be defined by database table names and fields that make no sense to anyone besides the developers who originally made them. An abstraction layer is a way to provide friendly names to the business users. So for instance, if you want to access fields in a general ledger, if the report designer shows the table “Led2001” and fields “NGLA” and “MeasureCredit,” it may be very cryptic, but if the same information shows as “General Ledger” and fields “Natural Account” and “Credit Activity,” there is a great possibility that those names will make sense to you. When reviewing metadata capabilities with the vendor, ask them to show you the source fields. If you recognize the names based on your experience with your ERP, you are on your way to selecting a good report writer.
- **Template driven:** Unlike the days of reporting from Excel in which every report required a specific tab with formulas and replicating tabs for entities, departments, etc., modern reporting tools offer the ability to create parameters to drive the report at run time. So, for instance, if there is a need to create a P&L report for every department, it should require a single template, a tab in Excel terms, that replicates for each department at run time. Templates also help ensure you are looking at valid data because formulas are often entered once and utilized by the template. When discussing with CPM vendors, ask them to show their template capabilities.
- **Hierarchies:** Hierarchies are often referred to as “trees” or “rollup structures” and are essential to financial reporting software. Hierarchies are commonly used to define the structure of a report at runtime. For example, if a P&L report calls for entities to be displayed across the columns, hierarchies can be used to control the display. At first glance, this may seem non-essential, as reports can be hard-coded, but when you consider that the same hierarchy can be used for all reports, easy maintenance begins to shine. If the reporting application allows the entities to be selected at runtime, it also opens up other possibilities to use the same report for statutory and management reporting as well as endless other scenarios in which one report template can be maintained, with the runtime results being many variations depending on the runtime parameters. Hierarchies are often used in the planning process as well. Ask the vendor to show you how hierarchies are created and maintained and how they are applied to report templates. Be sure to have your reporting hierarchies in mind when working with potential vendors so that they can provide specific examples.

- ***Drill-down/Drill-Through:*** Formatted reports help evaluate your organization, but a lot of the analysis and decision making may require you to dig deeper. Formatted reports should offer a data-mining option to drill into the details of any data in the report. Modern BI and CPM solutions should also offer the ability to drill through to other related transactions. As opposed to drill-down, which moves through the data vertically, drill-through will move through the data horizontally.
- ***Live Reporting:*** Modern BI/CPM solutions should utilize some sort of data store/ data warehouse to maintain data from disparate sources (see Business Data Warehouse section). However, some systems connect directly to the source ERP for live reporting. Accessing the ERP directly for real-time reporting certainly has the advantage of a live view into the current state of the business. However, this may come at the expense of scaling and performance because live reporting runs on the ERP, which may cause performance issues for the ERP as well. If your BI blueprint requires access to live ERP data, this may be a critical feature to review. Depending on the source system and the vendor, this option may or may not be available.
- ***Charting:*** Formatted reports offer a great way to review data in a well-organized format. However, modern BI and CPM solutions should offer robust options to display data within the reports. Because Excel has the capability to create worksheets with a mix of numbers and charts, it is likely that while reviewing your organization's reporting needs, you found many flavors of reports, from numbers only to charts only to a mixture of both. When reviewing vendor features, ask for sample reports that meet your organizations needs with a mixture of both plain numbers and a mixture of charting and numbers within formatted reports. Data visualizations help organizations make world-class decisions.

CONSOLIDATIONS & CLOSE PROCESS

Is your organization multi-national? Or do you have multiple entities? If so, you are already familiar with consolidation processes? If not, you may still want to dig into consolidation features. The consolidation process varies depending on the size and complexity of the organization. At the basic level, a small single-entity company may run a consolidation process to aggregate the departments for month-end reporting. As the organization scales, consolidation features within a business intelligence solution become increasingly important. When reviewing the consolidation features, the ideal solution should include a workflow capability to track the close process. While reviewing vendors, compare some of the following key features.

- **Currency Conversion:** Essential to reporting and consolidations for multi-national organizations, currency conversion can be handled a few different ways. The most popular method is an internal process that translates the data and stores the translated values. The translation process should be robust enough to cover simple to complex rules. For instance, a rule based on the GL account, the type of data and the entity. It should be possible to import monthly rates from a file, external server or manually enter the rates. It is also important to evaluate if the conversion process accommodates varying financial rules such as US generally accepted accounting principles (US GAAP), and the International Financial Reporting Standards (IFRS). Further analyze if these rules are available by default or if they need to be custom built for your organization. The latter may equate to longer implementation times, so it is ideal to find a vendor that offers a currency conversion process built in with the ability to customize as requisite.
- **Intercompany matching & eliminations:** Similar to currency conversion, matching and eliminations should be a process built into modern CPM solutions. Some ERPs have the capacity to store the details of the intercompany transaction, e.g. to and from entity. However, this information is not always readily available when the data moves into the system. Review the blueprint you started in Chapter 5 and ensure you cover any details needed to fully understand intercompany and elimination requirements. Once you have this information documented, ask the vendor to provide details on how your requirements will be handled.
- **Tracking journal adjustments from the ERP:** As part of the close process, dynamically tracking adjustments is key to consolidating data. This is especially important when closing the books each month, year, etc. The CPM solution should have a feature for the end users to easily reload the updated financials from the ERP as journal adjustments are posted within the ERP. It is important that this procedure be simple, quick and available for the end users. See more on this topic in the integrations section.
- **Consolidated reporting:** Once the previous steps in the consolidation process are completed, the final step is to run the consolidated reports. Your organization may want to look at consolidated or consolidating reports. Ensure the reporting engine can handle your consolidated reporting needs. Most consolidated reports require the use of hierarchies for easy management. This should include the ability to report on minority interest at different levels of the hierarchy. Provide some examples to the vendors you are reviewing to ensure the report writer can generate the reports in the required formats. If you have very complex requirements or have a large number of entities, ask the vendor to show the process and provide some details on performance running the consolidated reports.

FINANCIAL & OPERATIONAL PLANNING

Every organization has some sort of planning process. For small organizations it may be very simplistic in nature. As the organization grows, the complexities of the planning (budgeting and forecasting) process morph into a more complex system. With this growth, the requirements for a tool to help facilitate the process become more important. In Chapter 4, the planning process was discussed in detail, and in Chapter 5 we walked through designing a world-class CPM process. Understanding your organization's planning blueprint will help identify the specific planning feature needs. Spend extra time evaluating examples from your organization. Compare some of the following standard features found in modern BI and CPM solutions when reviewing vendor planning capabilities.

- ***Planning Designer:*** The planning templates should be fully integrated into and utilize the same design experience as the reporting templates. Utilizing the report writer to design the input templates will help ensure a consistent experience and lower the learning curve. The design experience is also critical to user adoption throughout the organization. Provide a few examples of your current budget templates to vendors and ask them to provide samples within their system. Even better, ask them to walk through creating a simple input template. This will help you evaluate how they go from start to finish. Compare and contrast that process to creating a report.
- ***Types of data:*** Creating planning forms is typically a more complex process than creating reports because you have to consider how the data is stored and how multiple input forms and the related data interact with one another. Most organizations start their planning process focused on the basics of revenue and expense budgeting. This is typically general ledger data. However, as the organization matures, there are many other areas of both financial and operational data to include in the planning process. The planning application should accommodate both financial and operational data. It should also accommodate multiple dimensions and members of dimensions that may not be found within the ERP. Many planning models call for the creation of “dummy” fields to help build the model. For instance, a typical requirement is a payroll budget. A payroll budget often contains information not found in the general ledger, e.g. employees with related compensation information such as healthcare benefits as well as other costs, such as the taxes associated with each employee. A payroll template will contain lots of details that rollup into GL accounts. Modern BI and CPM solutions provides the flexibility to create data at different grains to help model the final budget/forecast. When evaluating the data capabilities within the planning product, ensure the system can accommodate your planning model needs.

- **Assignment & Approval Workflow:** Assignment workflow is essential to helping organize the planning process. Assignments are a method of associating an input template with specific dimensionality to users in the organization. For example an assignment may associate a revenue budget template to one or many users based on their department. The assignment status should be trackable based on the templates and users. Approval workflow extends the assignment concept to include a linear approval path. For instance, once the user submits the budget, the department manager is notified to review and approve the budget. Once the approving user approves the budget, it moves to the next approving user in the approval workflow. Each organization handles workflow differently, so ensure the assignment and approval workflow feature is robust enough to handle your specific requirements. Additionally, world-class organizations are discovering that incorporating a collaborative approach into the workflow helps ensure transparency and accuracy of the budget. A modern BI and CPM solution should provide a method to discuss the planning data within the assignment and approval workflow. Take some time to review your planning blueprint to align your requirements with the vendor's workflow capabilities.

AD-HOC ANALYSIS/ DATA DISCOVERY

Most BI solutions offer some sort of ad-hoc reporting. Unlike formatted financial reports and dashboards, ad-hoc reporting should empower the end users to select sources and easily analyze data by dragging and dropping attributes and measures to generate a report. Some solutions will take this a step further and allow the users to apply data visualization, such as charts, to the results. This is a powerful method to give the users the ability to design and manage their own reports and graphical representations of the data. Data visualization is a great method of finding patterns as well as outliers in your data. Do you currently have ad-hoc reporting capabilities? We often see users that extract large 'data dumps' from source systems and then build their own reports in Excel. This can be a form of ad-hoc analysis but is a bit clunky and is often reserved for those that are technically inclined to extract and transform the data in a tool like Excel. Modern BI and CPM solutions offer ad-hoc analysis with a friendly user experience. While it should not take a data scientist to use an ad-hoc reporting tool, the users should understand the data they are looking at. Evaluate the different types of users in your organization to determine if ad-hoc reporting is important for your users. In future sections we will cover other options to view data.

DASHBOARDS & OTHER VISUALIZATIONS

Data visualizations have been around for many decades. The roots of the modern dashboard go back to the decision support systems of the 1970s. These days, dashboards can be found in almost

every modern enterprise software to provide a graphical representation of key information. Using graphical objects like charts and gauges are a great way to represent data within your organization. Unlike ad-hoc reporting or data discovery, dashboards are a great way to create visualizations to share across the organization. In building your BI blueprint, you may have already created your vision for dashboards in your organization. This may be key metrics (KPIs) for financial information or operational information. Most modern BI solutions offer dashboard capabilities. Some have a strong focus on dashboards and other visualizations and others focus on the basics, which may be found in tools like Excel. For instance, most financial charts are fundamentally basic and involve bar charts, pie charts, heat maps, geographic maps, etc., while organizations that have more complex operational data such as scientific statistics may need much more advanced visualization capabilities. Evaluate your organization's needs for data visualizations and ensure it is covered in the BI blueprint.

Organization & Search: As the user base grows, it is likely that the number of dashboards, reports and other BI information will grow as well. Having the ability to organize and search for these objects will help prevent chaos from breaking out. Modern BI and CPM solutions offer various methods to keep things tidy. For instance, based on your BI blueprint review from Chapter 5, you may find that you will need to organize reports, dashboards and other BI information based the 'type' of data. You may have operational data organized by different departments as well as monthly financials for consolidated reporting. That is a simple method of organization by the type of information contained in the dashboards. However, perhaps you also want to search or organize dashboards based on dashboards that have a parameter for your entity dimension or all dashboards. Or you may have a set of dashboards and reports that you want to package together as a "monthly reporting book" so that users know exactly which reports to review each month. You may also find that some of these groupings should be visible to only certain members of the organization (we will cover security in a later section). Modern BI and CPM solutions should offer multiple ways of organizing and searching for content. Ask the BI vendors to show you the different ways to organize dashboards and reports to ensure they match your needs.

Drill-Down: In the reporting section we covered the importance of drill-down and drill-through capabilities. We covered why world-class decisions are made when the top to bottom analysis is at your fingertips. The same applies for dashboards. Drill-down may manifest as a linkage to another dashboard widget, it may be a link to a formatted report or it may be some other method of exposing the underlying data. The bottom line is that the details are almost always needed for deeper analysis.

Widgets: Dashboards are typically made up of multiple elements. We refer to them as widgets. In order to ensure continuity across the dashboard, widgets should be independently designed and available in multiple dashboards, but you should also be able to connect together within a single dashboard. For

instance, if you click on the 2017 bar within a bar chart on widget one, widget two should update based on that selection. This interconnectivity ensures a seamless experience exploring data.

Charting types: Many BI solutions offer dozens and dozens of chart types. This is often needed when analyzing many types of data from, financial to scientific. However, CPM solutions often focus more on financial and operational business data, and thus the need for a vast number of charting types is not necessarily important. Consider your specific charting needs when analyzing the dashboard capabilities and compare to the chart types, gauges and other options available to design dashboards in the BI tools you review.

- **Storyboarding/Report Books**: Reports and dashboards are great methods to view and analyze data. However, in the boardroom we are usually telling a story about the performance of the organization. This story is not told by clicking around on different reports and dashboards; it is told by creating a story to visually explain the information. Modern BI and CPM solutions provide storyboarding or report book functionality. This is essentially the ability to mash up multiple types of information into a single presentation. So, for instance, we could start with a few dashboards, move to a few formatted reports and then end with a manually compiled PDF. Combining multiple types of reports and documents into a single experience is also beneficial to users within the organization who may not necessarily understand which reports or dashboards to review. Providing these users with a storyboard will help walk them through the important information. Review your BI blueprint and determine if storyboards will help your organization. If so, be sure to cover this topic when reviewing CPM products.

BUSINESS DATA WAREHOUSE

All of the features above require access to data. We will get to the “how” in the next section, with data integrations. But let’s start by assessing “what” to use to contain the data. Business intelligence products use a plethora of methods to store data. This includes both proprietary data stores developed by BI and CPM vendors as well as commercially available options such as Microsoft SQL Server, Oracle, IBM DB2 and MySQL to name a few. They also come in flavors of storage types, such as OLTP (online transaction processing) and OLAP (online analytical processing) as well as in-memory solutions such as SAP HANA and Microsoft SQL Server. In more recent years, we have seen the rise of cloud-based databases such as Microsoft Azure Data Warehouse and Amazon Redshift. All of these databases fall into two categories: SQL based and not SQL based. But what does all of this really mean? And what is really needed for a best in class BI/CPM solution? Well, it depends. Almost every flavor of database engine will potentially work. They all offer levels of performance, scalability, security and redundancy. So to assess the capabilities of

the total suite, you will want determine what types of data can be stored first. While the database engine may be capable of storing anything in any format, the business applications sitting on the underlying engine must be able to consume the information.

So what is the ideal business data warehouse?

- ***Configurable:*** Gone are the times of months and months of custom data warehouse development. Today's modern data stores should offer configuration options available to administrators and power users alike. This should include the ability to add fact tables and dimensions as needed to meet the reporting and planning requirements, as well as accommodate the needs of the data sources you plan to load into the system. The users should be able to create, edit and delete dimension information, for instance, the natural accounts within the account dimension or the employees within the employee dimension. Much of this information will more than likely come from an integration process, discussed in the next section. But it is also important for the power users to have access to manage this information as needed. As discussed in the planning section, many complex planning models require information that may not exist in a source system, so the data warehouse should be able to accommodate data that does not exist anywhere but within the data warehouse itself. Configuring the data warehouse should be done using a front-end application designed for power users managing the BI platform. The configuration capabilities are key to supporting the features we discussed in previous sections. The goal is to ensure the system can be managed by the power users and require minimal interaction with the information technology department or other IT experts.
- ***Multi-dimensional:*** The most popular method to store large volumes of information is in the format commonly known as the "star-schema." Basically what this means is that you have a set of data with lots of data points, called a "fact table," with related "dimensions," which help define the data in a fact table. So, for instance, if your house contains the facts "number of bedrooms," "number of bathrooms" and "square feet," the dimensions would be the street number, city, state and country. A multi-dimensional model is best used within data warehouses because it is designed to simplify the queries. The star schema is very different from your operational databases, like an ERP, because it is designed specifically for storing large volumes of data for reporting consumption.
- ***Big Data:*** What about big data? The term was probably been thrown around the office while going through Chapter 3: Assessing Your Organizations Decision-Making Ability, and it may even have popped up when you put together your BI blueprint, covered in Chapter 5. Big data is defined as "Extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human

behavior and interactions.”¹ Do you have big data in your organization? Big data can come from both structured and unstructured data. For instance, sales order processing systems or manufacturing and metering equipment can generate a large volume of structured data. Social media, images, videos, etc. produce a large volume of unstructured data. You may have already factored big data into your BI blueprint. By and large, big data is outside the bounds of a typical CPM model platform. If we looked at BI as pure analytics and CPM as financially focused reporting and planning, big data would usually fall on the far left side of BI. Now there are many cases in which big data information makes a lot of sense to bring into the CPM model. For example, Google Analytics information contains critical information about web traffic. If your organization depends on traffic to your website, this is important information to track. The good news is that many big data sources have handled the heavy lifting and provide aggregated data, which can reasonably apply to your CPM suite. This information, mashed up with other sales information, can be very powerful. There are other tools available to reduce big data to information consumable within a CPM platform. If you have identified big data within your organization, discuss the requirements with the CPM vendors to determine how they can accommodate the data needs. Most modern BI and CPM solutions will have options to incorporate big data.

Review your blueprint for reporting, planning and analysis and spend time exploring the data needed within your organization. Ask the vendors to show how you can manage the data warehouse. See it in action with information that makes sense to you. Keep in mind your organizations data, reporting, planning and dashboard needs.

DATA INTEGRATIONS

Access to data is critical to enabling world-class decision-making. Most business intelligence systems are independent of the ERP, and thus loading data is essential to BI solutions. Getting data into your shiny new BI system can be managed in many different ways. Depending on the number of disparate systems and the frequency of refreshing the data, importing data may occur as a manual process or as an automated process. The data may be structured information such as data found in a database or it may be unstructured data found in systems like Google Analytics. The most common method is to automate importing the data. Data specialists refer to this process as extracting, transforming and loading (ETL). There are a vast number of dedicated ETL solutions available. But many modern BI and CPM solutions offer data integration features built into the product suite.

As you continue to evolve your BI blueprint, covered in Chapter 5 and continue to dig into your organizational data needs, you may find that there are many sources of data key to your organization’s planning, reporting and analysis needs. Understanding your data needs is important

because it will help provide the questions to ask when evaluating the different ETL feature requirements. Depending on the requirements, CPM solutions with integrated ETL features may offer a shorter timeline to configure because they are designed for a specific purpose of extracting data from disparate systems and loading into a known central CPM database. However, the advantages that come with an integrated solution may result in fewer enterprise-grade ETL features. One of the most popular options for ETL is using a Microsoft product called SQL Server Integration Services (SSIS). This product is popular for organizations already using the Microsoft SQL Server database because it is included with the SQL Server license. The product is designed to be implemented by database developer professionals and is a very robust solution. However, with the very robust feature set comes a steep learning curve and implementation time. Many other popular standalone ETL tools replicate the features of SSIS but attempt to provide a more user-friendly experience to creating integrations. These robust tools are typically able to extract data from almost any data source and write back to almost any data source. The other class of ETL tools integrated into the business intelligence suites are designed with a specific purpose in mind. While these tools typically have a narrow scope of capabilities, they are typically designed for power users to configure as compared to database experts. The following are a few key features available with modern BI and CPM tools. Keep in mind that data is at the core of enabling world-class decisions because without data, there are no decisions to make.

- **Connectors:** Pre-built “connectors” are designed to access many popular data sources on-premises as well as cloud-based applications. Pre-built integrations will greatly speed up the time to implement your BI/CPM solution because much of the logic has already been applied to read from that source system. Gather your known data sources so that you can review them with CPM vendors. Ensure the integration capabilities will cover critical data sources. Additionally, evaluate if the connectors function without customization or if they require custom work to extract data from your key data sources.
- **User friendly interface:** Most ETL tools such as SQL Server Integration Services (SSIS) require database experts and often developers to create and manage. These types of tools are very robust and can usually handle very complex ETL requirements. However, they are not easy to learn and manage because they are designed to handle a vast spectrum of requirements. Integrated ETL features are typically easier to use because they have a narrow purpose. When evaluating integration features, try it out. You should be able to test out integrating with your data. If it does not take hours and volumes of documentation, you are on the path to enabling world-class decisions within your organization.
- **Processing data:** As we discussed in the consolidations section above, users often need to refresh data on demand. So it’s important that integrations are accessible by certain end users to refresh data from the source systems. Ideally, this is something that can happen

at a defined grain. For instance, Joe can update data for his entity and Jane can update data for her entity, within the organization. Scheduling is another basic requirement for an integration process. Most organizations run integrations monthly, weekly, daily and often by minutes. The frequency of the updates will depend on the amount of data moving each time the integration runs. If the integration process only loads changed data, it will often run within seconds versus refreshing an entire month's worth of data. Evaluate your data needs and ensure the options are available within the ETL features you review.

- **Notifications:** Email and in-application notifications are an important part of an integration solution. When a failure occurs, notifications should be sent out to warn the system administrators of the error. As the number of data sources increases or the complexity of the integration increases, notifications play an important role in managing the CPM solution.

Access to data is a critical component of modern BI and CPM solutions. With cloud solutions and API (application programming interfaces) becoming more and more pervasive, it is important to select a solution that can easily access data of all types in all places.

SECURITY

As more and more data flows into BI and CPM platforms, the security and privacy of that data becomes increasingly important. Exposing Google Analytics information may not be very harmful if it is leaked internally or externally, but payroll data is exponentially more sensitive. Modern BI and CPM solutions offer robust security features. One of the major advantages of selecting a CPM suite which encompasses all components we have discussed in previous sections (reporting, planning, analysis, data warehouse, integrations), is that the security model is controlled in one place and affects all components. If you piecemeal a CPM solution, there is a higher probability of errors because it is likely that you will need to maintain separate security models within each product. So what should you look out for when evaluating the security of a modern BI and CPM suite?

- **Application security:** The interface used by administrators, power users, and general users should have fine-grain controls to limit users to specific features and menus within the application as well as limit the options available within each menu (e.g., “Create,” “Read,” “Update” and “Delete” data. Think of it as a simple hierarchy of controls from the top feature down to actions possible within that feature group.
- **Data Access:** Locking down features and menu/sub-menu items is the first-level defense against unwanted usage of the application. Controlling access to data is the next level of

control. So, for instance, if you integrate with your general ledger data, payroll system and CRM, you may have some users that should see everything, others that should only see one source of data, e.g. CRM data and others that see sub-sets of the data. For instance, Frank can see GL data for his department but no other department and Ann can see sales data for her customers but no other customers from CRM. Having fine-grain controls are imperative to ensuring data security. Think about the different users in your organization and match them to the data you discovered when going through your own organization's data needs. Compile a matrix of who should see specific data across the CPM solution. This will be important information to discuss with the CPM vendor. Ensure the security model can handle the requirements of your organization.

- **Regulatory Compliance:** Depending on your organization, you may have strict regulatory compliance that you must follow when implementing a BI or CPM solution. There are many compliance standards around the world, and it is important to understand which are required within your organization to match with the vendor's accreditations. For instance, HIPPA is prevalent in the medical industry to ensure strict privacy guidelines for patient data. It's important to note that although your organization requires HIPPA compliance, the BI solution may not fall under that compliance if it does not contain HIPPA regulated data. The same may apply for other regulations. Review the compliance requirements and discuss with the BI vendors you evaluate.

Security is an extremely important component of modern BI and CPM suites. Depending on the size and complexity of your organization, consider the functionality needed to ensure your organization complies with regulations and effectively manages user access.

Deployment Options

For decades, enterprise software has been designed for local installs located within the corporate building. However, over the past several years, new options have been emerging. Cloud computing promises to revolutionize the software industry by offloading many of the dependencies tied to on-premises installations. And, more recently, a new hybrid model has grown in popularity. Choosing the deployment option best for your organization depends on many factors. But before we get into the details, let's start by defining the different options.

- **On-Premises:** On-premise deployments are when software and technology is installed and managed within the physical confines of the organization. Typically, with this option, the organization purchases the enterprise software to install locally.

- **Hosted:** Many organizations prefer to retain data centers outside their physical locations. The infrastructure (e.g., servers, etc.) can be managed by the information technology department within the organization or managed by the hosting provider. Like on-premise deployments, the organization typically purchases the enterprise software to install within the data center.
- **SaaS:** Software as a service, often referred to as the cloud, has been growing in popularity over the past several years. Unlike on premise and hosted options, SaaS is a lease of both infrastructure and software. The cloud company, Salesforce, helped innovate and the march towards enterprise SaaS solutions.
- **Hybrid:** The hybrid option has been growing in popularity over the past few years. This option is a mix of both on premise deployments and SaaS. For instance, global access may be handled via a portal within the SaaS environment but, components of the suite are installed locally on premise for live analysis on a data source.

Technology

Modern BI and CPM tools offer a mix of technologies. Many current CPM solutions were built as desktop applications with a database to hold data. Over the past decade, many of the mature BI and CPM vendors started moving their applications to web front ends with the same backend technology. This transition enabled further user adoption with lower costs of deployment. In more recent years, the same vendors have started to move their products to cloud services, or SaaS. Additionally, many new vendors have started as cloud-first products. SaaS solutions offer some advantages over the more traditional on-premises model, but not always. Read more about SaaS vs. on-premises services in Chapter 7.

- **Plugins:** Software vendors often leverage other applications to build out BI and CPM suites. In fact, most software created these days utilizes open-source components to provide best-in-class experiences as quickly as possible. For instance, some vendors utilize Microsoft Excel as the design experience for building reporting and budgeting templates. Imagine the work involved to replicate Excel! Utilizing that technology would provide an experience a large majority of users already know and it would enable the software vendor to focus efforts on other critical components within the suite. This approach does not come without disadvantages though. For instance, utilizing Excel may mean that the users may need to have an Excel license. Additionally, some functionality may not be possible when utilizing third-party plugins. Ask the vendors what, if any, plugins they depend on to run their products and review the impact of such dependencies.

- **Browsers:** Similar to technology in general, browser technology is rapidly changing. Most vendors prefer to take advantage of the newest capabilities found in the latest browsers. For instance, many vendors utilize the latest version of HTML, HTML 5, and JavaScript to run their applications. But not all browsers are created equally. Some are faster than others and some display content differently from browser to browser and version to version. The newer versions of the browsers will support the latest technologies, the older ones won't. Software vendors attempt to provide a consistent experience, but it's not always possible. Additionally, as mentioned above, plugins and other dependencies are common. For instance, in the last decade, many software vendors utilized Flash as well as Microsoft Silverlight technologies, both browser plugins, to run their applications. However, several of the top browser companies announced dropping these plugins several years ago, effectively leaving the software vendors searching for new technologies to replace the old. Assess your internal browser policies to determine which browser versions are used within your organization. If your organization has compliance regulations preventing you from using the latest and greatest browser technologies, discuss with the CPM vendors to ensure the minimum technology requirements can be deployed within your organization.
- **Apps Market:** In 2003, Apple announced the iTunes Store, and in 2008 they launched the app Store to provide a marketplace for musicians and software providers to showcase their products in one place for all Apple users to see, try and buy. It was a genius move that changed the industry. This concept continues to be very popular and is starting to show within modern BI and CPM products. Think of the potential of offering apps, such as ETL "connectors" from many different providers in one place or budgeting experts from around the world sharing their best budget templates to use within the vendors ecosystem. This approach provides great value and advantages to the users of the CPM suite. Chances are that if the vendors you review do not yet offer this technology, it's on their roadmap.
- **Application Programming Interface (API):** You may have heard the term API, web services or other terms like OData. An API is a method to programmatically interact with a software application. Most modern software applications offer a way for other applications to interact with data within the solution. APIs are often used by integration tools to pull or push data to and from the BI and CPM solutions. This is especially important for cloud-based solutions because the data is somewhat "locked" into that vendor's environment. Review your blueprint covered in Chapter 5 to determine the data within your organization. If you are using a third-party tool, for instance Power BI or Tableau, ask the vendor to demo an example of utilizing their API to connect to their data from an external tool. Or if you have other external systems that need to interact with the CPM system, review the requirements with the vendors.

Executive Summary

World-class decision making does not happen because a feature makes the decision for you, at least not yet. But together with world-class processes, modern BI and CPM tools are increasingly enabling organizations to make better decisions. This section outlined the most common features as well as covered some of the questions to ask vendors when reviewing BI and CPM products. Before continuing on your BI and CPM journey, it is important to stop and assess your BI blueprint. Which technologies are used today in your organization? Which technologies should be added to help facilitate world-class decisions, and which ones may slow the process? The BI and CPM landscape is constantly changing, so staying on top of this quickly changing space will help you leverage the new technologies. Keep in mind the old saying adopted from John Heywood by James Clear, “Rome wasn’t built in a day, but they were laying bricks every hour.” Establish your roadmap, start simple and focus on constant adjustments to match your organization’s BI goals.

Readiness checklist

Item	Your Score (1 lowest – 10 best)	Your Notes
Understanding of features and how they apply to your organization		
Feature requirements documented and built into organizational BI Blueprint		
Feature questions list to provide to vendors during demos and discussions.		
Total Score		

Chapter 8

Implementation Strategy: Cloud vs. On Premises

Selecting the correct implementation strategy for a particular new application you are considering can be daunting. Many organizations today are adopting a “cloud first” strategy when deploying new applications. In this chapter, we will discuss some of the kinds of systems that make up the cloud and how to start thinking about what approach makes sense for your business. One may reasonably ask some of the following questions: “Does this approach work in all cases for all of my applications?” “What are the security and infrastructure considerations faced when deciding how to implement a new system or product?” Answering these questions will be key to helping you set a strategy for your future application placement and your organization’s evolution in the era of the cloud. Our goal in this chapter is to help you understand what the cloud means, how organizations are taking advantage of its benefits, and to also outline some of the key questions you will need to ask yourself as you plan this journey.

What is the Cloud?

What is the cloud? Where is it and who owns it? How do you “move to the cloud”? What does the cloud mean in the context of my business? These may be some of the questions that you have asked in the process of discovering how the landscape of cloud-based offerings available may fit into your business strategy. The Cloud is really a phenomenally complicated and ever-changing ecosystem of services and service providers that allow different business to change the way they create, develop, organize, and run their businesses. The cloud may mean different things to different organizations and industries, but regardless of where you stand, it will have tremendous impact on the future of your business.

Let’s start with some definitions and a little history. The cloud today is a generic term to describe an offsite service provided by a specialized expert organization that has several key characteristics. To be a true Cloud service, a product or service must be geographically agnostic, fully resilient to infrastructure and software failures, and typically be delivered as a rented service to end-users. Cloud-based companies deliver services as diverse as ride hailing (Uber, Lyft), telecommunications

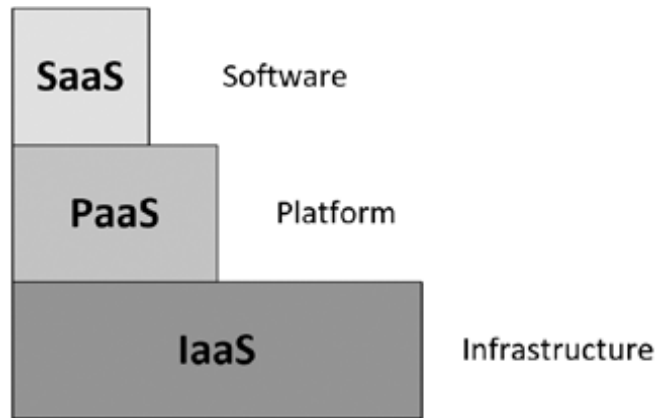
(Vonage, Ring Central, Ooma), eCommerce (Amazon, Alibaba) or enterprise software (SalesForce, Dynamics365, NetSuite). Cloud-based service delivery differs significantly from a traditional hosted or web-delivered interface in that the entirety of the end-user's experience is completely divorced from reliance on data being in any one place at one time. Many companies offer services hosted in one or two data centers and label them as "cloud," but until they are truly geographically agnostic, including having real-time site failure resiliency, they cannot be considered a true cloud offering.

The information technology landscape is changing quickly, and not all companies and organizations are adopting these changes at the same rate. One of the largest technology trends that has reshaped IT over the past 30+ years is the gradual movement of systems and infrastructure from traditional on-premise IT departments towards outsourced, hosted applications and infrastructure. There has been a long-term evolution of what hosting means in the past several decades, as the available technology and deployment methodologies have changed and improved.

In the mid 1990s, the concept of server colocation started to gain prominence with the rise of retail colocation, where a host company would build and operate space for other companies to house their servers. This was a highly capital-intensive business, as building and maintaining the infrastructure required to safely and securely operate servers required deep expertise in many technical areas. Over time, these skills gradually became more widespread within the IT workforce, allowing many competing firms to enter the marketplace, and what had been a specialized service rapidly evolved into a commodity service. This had the benefit of driving down costs and broadening access to server hosting capacity across the globe.

Many of these early providers of server hosting, also known as colocation, were eventually acquired by larger firms, as is common in a maturing industry. By the peak of the dot-com era, many, if not most of the internet service providers competing for retail internet customers also had robust colocation offerings.

Today, as the technology sector has matured, many of the systems and complexities involved in building and maintaining large-scale infrastructure are offered as a service to companies that do not want to manage and maintain them on their own. The advantages and efficiencies gained when scaling to medium or large enterprise size are hard to realize without significant investment in human and financial capital, and a number of service categories have arisen in the previous decade to address the different needs of the broader economy, not just technology companies. Three main service categories exist today: so called infrastructure-as-a-service (IaaS), platform-as-a-service (Paas), and software-as-a-service (SaaS). Each one plays a different role in the technology lifecycle of today's organizations, whether or not they are explicitly engaged in a technology-related industry.



Service stack hierarchy

IaaS is the spiritual successor to the hosting and colocation companies of the early internet era. IaaS allows a company to deploy nearly all of the traditional IT infrastructure in a managed environment, typically through a web-based graphical user interface (GUI) as well as through application program interfaces (APIs). Most of the IaaS vendors allow billing by the hour or the minute, allowing granular control over their spending of IT resources. As of 2017, there are really now only three major IaaS providers (although new service providers do arise from time to time): Amazon Web Services (AWS), Google Compute Cloud (GCC), and Microsoft's Azure Services (AS). Each has their particular specialties and strengths, but generally speaking, they provide nearly equivalent services for the basic service components. Examples of services that exist at the IaaS layer are things like virtual servers, virtual networks, firewall services, and block storage services. The big three IaaS vendors do offer many other services beyond these basic-level building blocks, but strictly Infrastructure items would be the large CAPEX hardware that doesn't see a rapid refresh in a traditional IT department.

PaaS abstracts the basic building blocks of IT systems to a higher level, creating services that are no longer really thought of as server hosting in the traditional sense. A PaaS vendor may have an offering where the primary user is more of a software developer than an IT system administrator and they work more in terms of managing applications that automatically scale out over the underlying servers without having to explicitly build them. PaaS offerings can be thought of as the tools used to build the cloud. Again, here the big three IaaS vendors have robust PaaS offerings as well and have become rather vertically integrated in terms of the cloud infrastructure they deliver to software developers. Database services that auto-scale and do not have manageable server nodes, scalable application services that are not manageable as discrete server nodes but accept code and auto-scale as demand requires, scalable file services that auto-grow and replicate across regions on demand, managed domain name services (DNS) that provide internet addressing, and specialized

computing platforms that are built for large-scale parallel processing are some of the examples of PaaS offerings available from AWS, GCC, AS and others.

SaaS products are yet another level of abstraction above the PaaS and IaaS worlds. If IaaS is the raw material, and PaaS the tools, then SaaS truly is the finished goods of the cloud ecosystem. This is really what most people think of when they think of the cloud, and it is what most end-users interact with if they are not in the development arena. The popularity of SaaS-based systems arose in the IT world from the desire to reduce costs, simplify maintenance and updating of software, and remove or reduce the need for in-house software development for in-house IT departments. Some early popular applications delivered under an SaaS model were applications such as customer relationship management (CRM), payroll processing, and enterprise resource planning.

Public Cloud vs. Private Cloud vs. Hybrid Cloud

Some organizations that have long histories of application deployment in a traditional company-owned datacenter are somewhat hesitant to move everything to cloud-based solutions. There may be legitimate security, compliance, risk, or statutory reasons that prevent some of these workloads from transitioning smoothly to a cloud provider. These concerns have given rise to a category of hosting called “private cloud,” in contrast to the so-called “public cloud” offerings we have discussed so far. Private Clouds are not in very high demand to-date, as they carry a tremendous expense, comparable to running and managing one’s own infrastructure on dedicated hardware. Currently, as of early 2017, of the big three cloud providers, only Microsoft has a generally available private cloud platform available or on its roadmap, with their first general release of Azure Stack³.

The private cloud has two variations in meaning that are commonly discussed. In one, a section of a public cloud vendor’s resources are segmented off into a separate offering that is dedicated to a specific client. These are typically only available for a high price, long-term contract, as it requires separate physical infrastructure to be built and maintained. Generally, in typical public cloud offerings, when you are running a server in a particular provider’s region, you do not have any control over which actual hardware your server is running on. The virtualization software that abstracts the host computer hardware and presents it to the virtual server you are using allows for many parallel virtual machines to run at once on a single physical computer. Each virtual server may get a sliver of the underlying hardware resources, allocated per the requested size of the virtual machine. Consequentially, you also do not have control over who else is running virtual machines on the hardware your server is running on. The cloud host manages the allocation of workloads automatically without the “guests” having to pay attention to where they are placed. Although the virtualization is very robust and reliable, there are possible security concerns related to running sensitive workloads on a shared infrastructure. So-called

³ Azure Stack: <https://azure.microsoft.com/en-us/overview/azure-stack/>

“side channel attacks” or “virtualization escapes” can leak sensitive information from a target virtual machine (VM) to an attacker’s VM if they are on the same hardware. Although these are very rare and difficult to implement, they are not completely unheard of, especially in the realm of financial institutions and government services, where the data held or processed can be extremely valuable to an attacker. In early 2017, a computer security competition sponsored by the security software company Trend Micro called Pwn2Own⁴, was won by a team that used a combination of vulnerabilities in the VMWare Virtualization system, Windows 10, and Microsoft’s Edge Browser to compromise a host operating system from a website accessed by a guest virtual machine. This combination of exploits, while highly sophisticated and difficult to utilize, demonstrate that even the security barriers imposed by virtualizing an operating system are not 100% perfect. To be sure, exploit combinations like this are rare, but they exist and are a serious risk if systems are left unpatched. To help mitigate these and other similar attack methods, the idea of a private cloud has gained popularity, especially for large enterprises and government entities, as it allows a greater measure of control over the infrastructure and companion workloads.

In practice, true private clouds hosted by large public providers are rather limited. One of the main advantages of using a cloud service in the first place is a high degree of redundancy available by having many locations where data or services reside to allow for resiliency in the case of site failure. When this book went to press, the Azure Government Cloud only had two locations for federal, state, and local government customers (Virginia and Iowa⁵) and AWS only has one region with at least two data centers, located in the northwestern United States⁶. Currently, Google does not have a true Private Cloud offering at all, but has a wide SaaS offering called G-Suite⁷ which is comprised of a wide variety of office productivity tools similar to Google Docs. This comparative lack of geodiversity highlights a key limitation of building a private cloud: it is extremely expensive and even the largest clients cannot drive demand large enough to influence the private cloud providers to create high levels of redundancy and geodiversity seen in the public cloud offerings.

So, what does the private cloud mean in practice for the commercial sector? Realistically, true private clouds are pretty rare as a commercial offering and are mostly the domain of large enterprises who refactor their infrastructure to separate the application developers from infrastructure maintainers. There are many vendors that “private cloud” offer products, but they are more accurately called “managed hosting” with a robust PaaS interface. What this typically means is that there are actual discrete physical or virtual servers allocated to a user, who can choose to place those dedicated servers in one of many data centers that the vendor controls. Building a cloud out of this infrastructure still requires considerable design and engineering capability on the part of the end-user. This is not necessarily a bad way to design a large-scale global infrastructure, but the

⁴ <http://blog.trendmicro.com/pwn2own-2017-event-ages/>

⁵ Azure Products by Region/Locations <https://azure.microsoft.com/en-us/regions/services/>

⁶ AWS Global Infrastructure: <https://aws.amazon.com/about-aws/global-infrastructure/>

⁷ G-Suite: <https://gsuite.google.com/industries/government/>

organization's goals and resources available may not be a good match to direct management of servers at this level of detail.

At the end of the day, deciding between a public cloud, private cloud, or on-premises hosting for solution infrastructure comes down to balancing the needs of the organization against the resources available to address that need, just like any other major decision. The key to deciding how to architect a particular solution lies in getting a full picture of the costs and benefits of a particular solution, which are sometimes obscured in the early discovery/design phase of a project. Unfortunately, what this means is that we cannot tell you a simple rule for how to make this decision. You cannot say, "cloud is good" or "cloud is bad" and design your systems from this statement. Some organizations, due to the nature of their business and age in their organizational life, will find that cloud-based solutions are a great fit for them as they start to scale up. For others, they may determine that the risks and roadblocks are sufficiently high that they don't see a large benefit from re-creating all their infrastructure in the cloud. It is our belief that for most organizations, the "best" path will typically lie somewhere in the middle with a so-called "hybrid" approach to cloud adoption. Some applications are extremely successful in an external hosted environment, and others struggle, especially when there are numerous and complex system integrations and interdependencies to manage.

The term "hybrid cloud" describes the situation where an organization may utilize cloud vendors for some applications but retain other applications or functions in an on premise facility. Different business functions will find more or less success in a cloud environment depending on how difficult they are to migrate, how critical to their business their supporting applications are, an organization's overall risk tolerance, and many other considerations. Some questions to ask yourself when considering where (cloud vs. self-hosted) to place an application may include:

- 1) Does the application in question require extensive customization to be useful to your organization?
- 2) Does the application in question have many dependencies on other applications you use or are planning to use?
- 3) Could your organization continue to conduct business if the cloud service were to be discontinued, or can you describe an effective mitigation/migration strategy once you start using it?
- 4) Is the application a consumer or producer of large volumes of data that need to be transferred to or from another application in your environment?

There are many other considerations to take into account, and getting a full picture of the impact of choosing one path over another requires performing a detailed assessment of how the application will fit into the overall context of your organization's system architecture. This assessment will

include details about how the application will interact with other applications, cost assessments, user count and placement analysis, business continuity and disaster recovery planning, data dependencies, business process planning, and many others.

Microsoft in particular is one of the biggest proponents of the hybrid cloud approach solution to architecture. They designed their Azure platform to naturally integrate with their traditional on-premises solutions and are slowly pushing their on-premises customers to embrace cloud-based technologies through their hybrid cloud strategy. In a white paper⁸ on the Azure Stack platform released early in 2016, Microsoft articulated the following vision in a summary statement for the hybrid cloud:

“Ultimately, we want organizations to be able to embrace the notion of cloud-first on their terms – every journey to cloud computing is different and we want to support all of them. In this way, we believe customers can realize the value of the cloud paradigm across their organization, regardless of location, and thereby refocus their resources on the investments that competitively differentiate them in the marketplace.”

Given that we are still in the very early days of the “transition of paradigms” that cloud computing is promising, it is safe to say that for the typical organization, the transition will be a gradual one. Microsoft is betting that, at least for the foreseeable future, most organizations that have already a heavy capital and knowledge investment in Microsoft-based technologies will be more comfortable deploying cloud-based resources on their own timelines. We feel that this is a reasonable approach that respects the huge diversity in organizational complexity, flexibility, appetite for change, and technical capabilities that most companies have today.

Readiness checklist

Item	Your Score (1 lowest – 10 best)	Your Notes
Do you have a current service catalog of your financial institution’s applications?		
Do you have a roadmap for the lifecycle of each application in your service catalog?		

⁸ <http://download.microsoft.com/download/3/F/3/3F3811C0-969D-422C-9EDA-42CB79BABA96/Bring-the-cloud-to-your-datacenter-Microsoft-Azure-Stack.pdf>

Do you have a defined strategy for cloud adoption on an organization-wide or service level basis?		
Have you discussed the challenges that each application owner experiences and considered how these challenges could be addressed by thoughtful system placement?		
Total Score		

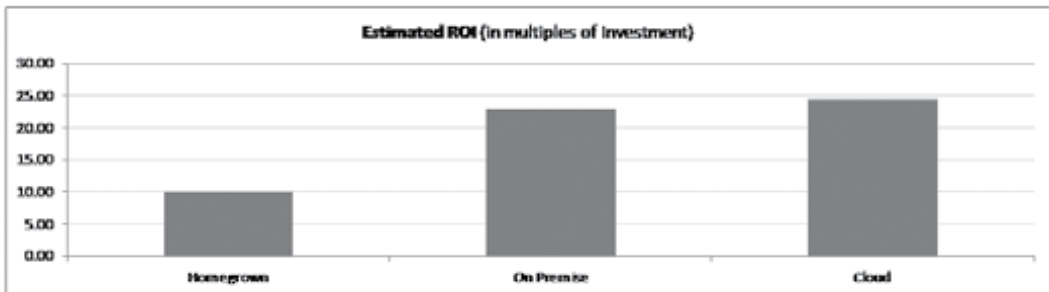
Appendix 1

ROI Calculator

Many organizations like to analyze the estimated return on investment (ROI) for a software purchase or subscription. Due to all the variables involved and the difficulties in translating the projected benefits into financial terms, ROI calculations are often skipped. Below, you will find an example of an ROI calculator populated with sample figures and assumptions of potential benefits and investment costs.

ROI Calculator - Corporate Performance Management Solution

Estimated Number of Users:		50		
Enter est. hourly cost of internal IT resources :		\$45		
		25	2,000	5,000
ESTIMATED BENEFITS / INVESTMENTS (based on 5 Year Period)		SOLUTION		
Benefits	Comments	Homegrown	On Premise	Cloud
Improved Decision-making	As a result of faster, better, more accurate information	\$ 2,000,000	\$ 4,000,000	\$ 4,000,000
Improved User Satisfaction	Lower turnover and higher productivity	\$ 250,000	\$ 1,250,000	\$ 1,350,000
Total Benefit Value		\$ 2,250,000	\$ 5,250,000	\$ 5,350,000
Investments	Comments			
Hardware	Hardware cost	\$ 20,000	\$ 20,000	\$ -
Software	All software/SaaS cost	\$ 5,000	\$ 75,000	\$ 130,000
Implementation/Development Cost	Estimated labor cost	\$ 45,000	\$ 65,000	\$ 60,000
Opportunity Cost	Productivity loss of not having professional CPM solution	\$ 75,000	\$ -	\$ -
Ongoing Support Cost	Cost of ongoing model support/assistance	\$ 22,500	\$ 26,250	\$ 21,000
Ongoing Upgrade Cost	Labor cost of installing new versions and bug fixes	\$ 36,000	\$ 33,750	\$ -
Total Investments		\$ 203,500	\$ 220,000	\$ 211,000
Benefit Value less Investment Cost		\$ 2,046,500	\$ 5,030,000	\$ 5,139,000
ROI	Based on 5 years Deployment Period	10.06	22.86	24.36



Appendix 2

Integrating 3rd Party Applications to your CPM Solution

As modern BI and CPM solutions mature and the age of open connectivity continues to grow, third party applications or “apps” will continue to play an important role within the industry. Chances are that as you continue to evolve your BI vision and blueprint, you will find gaps in the product offerings, so additional software may need to be selected to fill those gaps. In the past, connecting the puzzle pieces together was a daunting exercise. Nowadays it is becoming easier to tie niche features into the BI and CPM platform, utilizing API's. Modern BI and CPM platforms are starting to offer an environment to integrate and even build niche solutions to plug into the solution. This helps ensure continuity with user security and user experience within one platform.

3rd party apps may be fully integrated or may be separate applications which fills a gap and or enhances the suite. For instance Microsoft's Power BI can utilize data from other providers like Solver's BI360 or Anaplan and be used as a plugin for those platforms. Some 3rd party apps may fill other needs like “r” analysis for data scientists or running simulations on data. While other 3rd party apps may fill deeper niche needs like special features for the healthcare or manufacturing industry.

Much like the open source plugins many software engineers utilize to provide specific functionality, modern BI and CPM solutions will continue to evolve the 3rd party capabilities to help ensure an ecosystem is available to meet the constantly changing requirements of organizations with world class decisions makers.

Appendix 3

How CPA & Consulting Firms can Deliver World-Class CPM to Their Clients

Market Trends

Companies are increasingly outsourcing accounting and corporate performance management (CPM) activities because of technology progress, globalization market trends and popularity of outsourcing non-core business processes.

In recent decades, outsourcing services have grown in popularity as globalization has increased competition and driven many firms to maximize focus on core business activities. At the same time, progress in technology enablers such as internet, cloud services, etc. have also made it easier and more affordable for CPAs and other financial services firms to deliver remote services to clients.

While CPA firms have been handling accounting for their clients for a number of years, modern BI solutions with web interfaces and cloud platforms now also provide them with a solution to deliver sophisticated reporting, planning and analysis services to clients interested in outsourcing these types of activities. When the services firm is hosting all their clients in a private cloud or using a vendor's public cloud solution, and thus has easy access to their data, these offerings will increasingly also include benchmarking services, where a client's KPIs are compared to industry averages.

How does it work?

For a number of years, CPAs and other consulting firms have built custom, manually updated, client-facing web portals using technologies like Microsoft SharePoint, and each month they post their clients' reports there and provide each user with a log in for remote access. Some also email the reports to their clients. The trend, however, is for these outsourcing firms to use automated integration tools to load their clients' data into a centrally hosted, multi-tenant BI solution, where they typically provide high quality, pre-built templates for reporting and budgeting that

are available on a self-service basis through the CPM tool's web interface. Their clients can log in and use the templates any time they want or they receive an email notification that their data (e.g., presented in monthly financial reports) is ready for analysis. Some BI tools also offer built-in commentary, where the CPAs and analysts can enter their narrative to support clients in their analysis. And some BI solutions have web-portal administration functionality to make it very quick and easy to manage each client, share templates across clients, customize reports where requested, etc.

Appendix 4

Hardware/Software/Performance Considerations

Generally speaking, application system performance is difficult to quantify. The simplest and best way to think about whether or not you have a “well performing” system is to compare it to your users’ expectations. In absolute terms, there is no single universal benchmark that can be applied to a system as a whole to measure if it is performing well outside of what is typically defined in a service-level agreement (SLA) between the users and the provider of the service. When determining if a cloud-based system is operating within its designed performance tolerances, most services will only report on and manage system availability and will only agree to be held to the definition of uptime expressed in the associated SLA. This is a key consideration when planning where to place a system or application, namely concerning how much control you wish to have over the service provider in question. In very rare cases, a cloud provider will agree to alter general terms and conditions to provide expanded uptime above and beyond a general SLA. Additionally, the liability is typically limited to the fees paid for the services in the billing during which an outage occurred. While most professional service providers have generally good track records, even Amazon, Microsoft, and Google have had major system outages from time to time. This lack of control over the underlying vendor needs to be taken into account when considering the criticality of a given outsourced service.

While there are measurements that can be done on various underlying systems which an internal IT department or cloud infrastructure operations team will monitor to verify that a server or service is responding in a way that meets design expectations, these lower-level measurements are not typically helpful for executive-level management. Internally, they may be used to contribute to an overall health dashboard for a system. In a cloud environment, one of the major metrics that are typically tracked is system uptime, which falls more under a system resiliency discussion, rather than performance. Software developers who design the cloud applications need to take into account the fact that users may be connecting to the services from anywhere and pay special attention to optimizing the network performance and making sure the application is resilient to temporary disconnects or slowdowns. Frequently, the largest source of system problems comes from either loading too many users on a system or from some type of network connectivity problem. The responsibility of managing the internal performance of a cloud application is one of the defining characteristic benefits of choosing such a system.

Appendix 5

Security Considerations

What does security mean in the context of cloud applications? A comprehensive discussion of what it means to be secure is beyond the scope of this book; however, we will outline a few key questions that should stay at the top of your mind when discussing security with your organization's stakeholders and vendors. In a way, the traditional model of tactical security management has changed completely now that cloud applications have become commonplace. The biggest shift is that there is a much greater reliance on vendor security management of your new distributed infrastructure. In this context, the role of a chief information security officer (CISO) evolves from focusing on developing an organization's internal security strategy, policies, and response plans into one that is highly driven by examining, managing, and auditing an increasing number of policies and practices of 3rd-party organizations. For example, once you move a given user-facing application to an external vendor you now have to consider how your users will authenticate themselves, how you manage access control, and a host of other user-facing issues that can be more easily addressed in a single organization. This is not to say that there are no solutions to the issues that a distributed vendor-centric approach to security management will surface, only that the types of challenges change.

One thing to always remember: Moving your applications to a cloud-based system is not a situation where you can “fire and forget” the application, especially from a security perspective. If you are using a 3rd-party hosted or outsourced system for a critical business process, it is also critical to have a plan for business continuity if there is a security or technical related interruption to the service. One side effect of a large number of business critical systems being outsourced to cloud vendors is that the collective value of the data these vendors provide increases geometrically. Thus, the data in question becomes much more attractive for criminal actors to attempt to access and filtrate. Data breaches that make the news are disturbingly common, and their frequency will increase as more and more applications gain large numbers of customers.

Fortunately, most of the companies hosting sensitive data are aware of the risks and work vigorously to mitigate threats before they cause large losses. Depending on the type of data held, hosting organizations will be required to show compliance with one or more compliance standards, such as the payment card industry (PCI) compliance standard, parts of the Health Insurance Portability

and Accountability Act (HIPAA), ISO/IEC 27001:2013 – Information technology – Security techniques – Information security management systems – Requirements (ISO 27001/27002), and potentially others. These policy standards offer guidelines that, depending on the industry served, hosting organizations need to be aware of and show compliance with. As a potential customer of an organization hosting or processing sensitive data, you have the right, and in many cases the obligation, to review audit details of vendor organizational compliance with these standards.

Below are some questions to get you started on your conversation with the security professionals in your organization:

- 1) As the number of cloud-based systems that our organization uses grows, how will we manage user logins and password resets?
- 2) Do we have the capability to assess if a given cloud vendor is applying current security best practices in their operational policies?
- 3) Do we have a strategy for managing our exposure to data breach or loss in the context of outsourcing critical parts of our infrastructure?
- 4) Do we have an effective audit partner who can help us examine the security practices of the vendor organizations we are considering partnering with?

Appendix 6

Terminology and Definitions

Application Programming Interface (API) - In general terms, it is a set of clearly defined methods of communication between various software components

Artificial Intelligence (AI) - Any device that perceives its environment and takes actions that maximize its chance of success at some goal

Balanced Scorecard – A strategy performance management tool

Big Data – A term for data sets that are so large or complex that traditional data processing application software is inadequate to deal with them

Bottom-Up Budget - Each department determines their individual budget and then that is rolled-up to the company's overall budget.

Breakback Template- A template that will create an entire budget or forecast with as little as a single number. More amounts can be entered for more accuracy.

Business Intelligence (BI) - Comprises the set of strategies, processes, applications, data, technologies and technical architectures which are used companies to support the collection, data analysis, presentation and dissemination of business information.

Business Requirements Document (BRD) – A document details the business solution for a project including the documentation of customer needs and expectations.

Closing the Loop - Tying the planning, reporting, analysis, and strategy together.

Cloud Computing - A type of Internet-based computing that provides shared computer processing resources and data to computers and other devices on demand.

Colocation - The practice of placing servers from multiple tenants in a single physical data center operated by a 3rd party. Tenants rent space, power capacity, network connectivity and typically basic “remote hands” services from the operator of the data center.

Corporate Performance Management (CPM) – An umbrella term that describes the methodologies, metrics, processes and systems used to monitor and manage the business performance of an enterprise.

Data Center - A secure space where organizations can place servers, networking, data storage, and other equipment for their safe and efficient operation. Some data centers are owned and operated by the same organizations that place equipment in them, and other data centers rent their capacity to 3rd parties. “Colocation” refers to the practice of placing and operating one’s servers and other equipment in a datacenter operated by another organization. Data centers are where “the cloud” is operated from.

Dashboard - Visualization tool that will display Key Performance Indicators and can be customized to individual users.

Data Warehouse (DW) - DWs are central repositories of integrated data from one or more disparate sources. They store current and historical data in one single place and are used for creating analytical reports for knowledge workers throughout the enterprise.

Data Mart - A subset of the data warehouse and is usually oriented to a specific business line or team

Deep Learning - Part of a broader family of machine learning methods based on learning representations of data.

Dimension – A structure that categorizes facts and measures in order to enable users to answer business questions. Commonly used dimensions are people, products, place and time. In a data warehouse, dimensions provide structured labeling information to otherwise unordered numeric measures.

Enterprise Performance Management (EPM) – Used interchangeably with the term Corporate Performance Management (see definition above).

Extract Transform Load (ETL) - The process of extraction, transformation and loading data from a source system, such as an ERP. It includes the following sub-processes. 1. Extracting data from external data storage or transmission sources. 2. Transforming data into an understandable

format, where data is typically stored together with an error detection and correction code to meet operational needs. 3. Loading data to the receiving end.

Fact Table - Consists of the measurements, metrics or facts of a business process. It is located at the center of a star schema or a snowflake schema surrounded by dimension tables.

Full-Time Equivalent (FTE) - Takes the hours worked by an employee divided by 2,080, which is a full-time employee.

Hybrid-Cloud - A Hybrid-Cloud type deployment is one where certain aspects or components of a system reside on a customer-managed on-premise environment and certain components reside in a cloud delivered system. One example of a Hybrid-Cloud system is Microsoft's flagship email software, Microsoft Exchange Server. Some organizations have Exchange Server deployments that interface with Microsoft's Office 365 Exchange Servers to allow certain features and functions to be managed in the Azure environment while retaining some components "in-house".

Infrastructure-as-a-Service (IaaS) - A service delivery model where lower level technology functions that are typically very capital intensive for a single organization to procure are provided on a per-hour or per-minute "rental" basis. Typical Services delivered under an IaaS model include, but are not limited to Servers, Networks, Firewalls, Load Balancing, and File Storage services.

Key Performance Indicator (KPI) - a measurable value that demonstrates how effectively a company is achieving key business objectives.

Machine Learning – Construction and study of systems that can learn from data.

Metadata - Metadata describes other data. It provides information about a certain item's content or acts as an abstraction layer from the underlying data. For example, in an accounting system, a field may have an encrypted name. The metadata can provide a means of showing a friendly name to the end user.

Metric - A system or standard of measurement.

On Premise Deployment – Installation of a software solution in an organization's local IT environment.

Platform-as-a-Service (PaaS) - A service delivery model where the lower level building blocks of IT infrastructure are abstracted to higher level systems and then provided as a rented service on a per-hour or per-minute basis. Typical services delivered under a PaaS model are Auto-Scaling

Service platforms that run managed software code, Scalable Database Services, Domain Name Services and geographically agnostic replicating file services.

Playlist - In a BI or CPM context, a playlist can be a list of reports, forms or dashboards organized in a specific order.

Private Cloud - The term “Private Cloud” most commonly refers to a private instance of one or more IT-related services provided to an organization. The services offered in a Private Cloud Solution may be IaaS, PaaS, or SaaS in nature, but the defining characteristic is that the infrastructure they are running on is owned, or managed by one organization.

Public Cloud - The Public Cloud consists of services provided to any customer who rents services on an IaaS, PaaS, or SaaS solution. They are called “Public” because there are no organizational restrictions on who can sign up for and use them, and are open to all paying customers.

Software-as-a-Service (SaaS) - A service delivery model where an application is delivered to an organization as a rented service, usually on a monthly or annual basis. SaaS products generally differ in their audiences from IaaS and PaaS in that they are targeted to the non-technical end-users of an application rather than the software developer type consumer. Examples of SaaS applications are nearly any application that is sold as a “cloud” based application. The entire technology stack is hidden from the end-user, who only interacts with the product through a well-defined user interface.

SQL Server Integration Services (SSIS) – A Microsoft platform for data integration and workflow applications. It features a data warehousing tool used for data extraction, transformation, and loading (ETL).

Star-Schema - the simplest style of data mart schema and is the approach most widely used to develop data warehouses and dimensional data marts. The star schema consists of one or more fact tables referencing any number of dimension tables.

Storyboard – In a BI or CPM context this term has the same meaning as a Playlist (see definition above)

Strategic Initiatives - Using resources, both employee and financially, committed to accomplish objectives of the organization.

SWOT Analysis - An analytical structure that evaluates an organization for elements both internal, strengths and weaknesses, as well as external, the opportunities and threats.

Top-Down Budget - Management comes up with a budget and then apportions out amounts to each department, which is then used to budget against.

Variance Analysis - Calculates the difference between the actual and the planned dollars and then investigate the differences and determine the causes.

Virtual Machine - An instance of a computer operating system running on emulated or “virtual” hardware. “Virtualizing” hardware allows efficient use of large servers by slicing up computing power to be used by many copies of an operating system which can run in parallel.

About the Authors

Michael Buehner, Michael Applegate, Corey Barak, Hadrian Knotz, and Nils Rasmussen are technology executives with more than 120 years of combined experience with corporate performance management, business intelligence software, and industry verticals. They share a common passion for improvement and automation of business processes as it relates to reporting, budgeting/forecasting, and data analysis.

The world is a fast-changing, technology-driven marketplace where trends ripple across the globe at blazing speed.

That means slow-moving organizations fall behind, which is why companies must arm managers and employees with modern, integrated corporate performance management tools to set and track goals, adjust plans and budgets, and monitor performance.

In this book, three technology executives with more than 120 years of combined experience with corporate performance management, business intelligence software, and industry verticals, explain the importance of good planning, reporting, and analysis solutions to enable fast, efficient decision-making.

They walk you through how to assess the decision-making capabilities of your organization today versus those of a best-in-class business. By evaluating the ability of employees to make optimal decisions versus where you want them to be, you'll identify where you can improve.

Even if the future is not here today, you can prepare for it by cleaning up the data in your systems, getting organized, and connecting planning, reporting, and analysis processes.

World-class decision making does not happen because a feature makes the decision for you, at least not yet. But together with world-class processes and the latest business intelligence tools, you can make better decisions.

