

# [A Guide to Enterprise Reporting](#)

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## Introduction ...

## How Can I Use This Guide?

This is a brief guide to enterprise reporting. It is intended to help people who have to rapidly come to grips with concepts in enterprise reporting. Target roles include project managers, business analysts and system architects. Whether you're managing business and functional requirements, evaluating tools or running formal vendor selection process, there are three ways to use this guide:

- **Glossary** - Basic definitions for the key ideas in reporting, with links to further reading.
- **Checklist** - Report design elements and business and functional requirements you need to consider.
- **Tutorial** - Anticipating and grappling with the difficult organisational issues in delivering enterprise reporting.

The emphasis here is on the *effective delivery of information to managers*. This guide will not help you with specific content ie what your organisation should be reporting on (finances, operations etc). Nor does it review reporting and BI vendors and consultancies.

## Definition . . .

## What is Enterprise Reporting?

I define enterprise reporting (or management reporting) as the regular provision of information to decision-makers within an organisation to support them in their work. These reports can take the form of graphs, text and tables and, typically, are disseminated through an intranet as a set of regularly updated web pages (or "enterprise portal"). Alternatively, they may be emailed directly to users or simply printed out and handed around, in the time-honoured fashion.

## Types of Enterprise Reports

- **Metric Management** - In many organisation, business performance is managed through outcome-oriented metrics. For external groups, these are [Service Level Agreements](#) (SLAs). For internal management, they are [Key Performance Indicators](#) (KPIs). Typically, there are agreed targets to be tracked against over a period of time. They may be used as part of other management strategies such as [Six Sigma](#) or [Total Quality Management](#) (TQM).
- **Dashboards** - A popular idea is to present a range of different indicators on the one page, like a dashboard in a car. Typically, vendors will sell you "canned reports" (pre-defined reports with static elements and fixed structure). However, this approach should allow users to customise their dashboard view, and set targets for various metrics. It's common to have traffic-lights defined for performance (red, orange, green) to draw management attention to particular areas.
- **Balanced Scorecards** - A method developed by [Kaplan and Norton](#) that attempts to present an integrated view of success in an organisation. In addition to financial performance, they also include customer, business process and learning and growth perspectives. (You should read about this if you're not sure what kinds of things to report on.)

## Out of Scope

- **Ad Hoc Analyses** - Typically undertaken once to deal with a specific initiative, and then never revisited. They often involve building a model in a spreadsheet to allow exploration of "what-if" scenarios. Alternatively, they may take the form of a written brief or one-off report for management.
- **Interactive Querying** - Best exemplified by [OLAP](#), this refers to specific technology that allows an analyst (or savvy manager) to manipulate directly the presentation of data. The analyst can select dimensions (eg. time, location, department, employee etc) and "drill-down" (expand) and "roll-up" (collapse) the data.
- **Data Mining (and Advanced Statistics)** - Here, techniques such as neural networks and machine learning are used to discover novel, interesting and useful patterns in the data. This is best suited for analyses such as classification, segmentation, clustering and prediction.

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## Rationale . . .

### Why Are We Doing This Project?

It's important to understand the rationale for the reports in the first place. If your organisation has a formal business case - great! Chances are, you won't, so you will need to appreciate why the sponsor (or client, or stakeholders) have forked out cash to make it happen. Here are some possible scenarios, grouped by rationale:

#### Scenarios

Cost Reduction	Benefit Increase	Change in Environment	Political Considerations
<ul style="list-style-type: none"> <li>• Legacy system too expensive to run</li> </ul>	<ul style="list-style-type: none"> <li>• Users need new features</li> <li>• More users or reports than before</li> </ul>	<ul style="list-style-type: none"> <li>• Mergers, acquisitions and spin-offs</li> </ul>	<ul style="list-style-type: none"> <li>• Sponsor needs sexy project</li> <li>• Someone needs to keep you busy</li> </ul>

- Legacy system too slow and clunky
- Employees waste too much time
- Reports are flaky or old-fashioned
- Incomplete or unintegrated data
- Increase reliability and quality of reports
- Source systems shutting down
- New systems employed
- Training requirements of staff changed
- Legal or regulatory shifts
- Showcasing your organisation's prowess
- Part of program to drive cultural change

## Project Factors

You should be sensitive to the relative importance of the following factors, as trade-offs between these must be made continually throughout your project:

- **Time** - Remember to consider both elapsed time and effort (staff-hours). Project Management methods will help you with this aspect.
- **Cost** - Don't forget to include risks, opportunity costs, labour, the cost of capital and the time value of money. You should think about employing [Total Cost of Ownership](#) (TCO) methods here.
- **Quality** - You need to wear different hats for understanding quality, ranging from "meeting the users' expectations", to "conformance to specifications".
- **Scope** - Not all features for everyone can be delivered straight away. You might want to look at pilots, phased roll-outs and vendor trials to lower your time, cost or quality risks.

## Design Levels

In addition, each of these plays out at different levels of your project:

- **Project** - Development of overall reporting system. The project manager or vendor delivering the system will be most concerned about trade-offs here.
- **Report** - Design and deployment of each report. This is the realm of report designers and business analysts.
- **Delivery** - Regular publication and distribution of report set. The person responsible for the day-to-day publishing of reports will make these decisions.
- **Usage** - Browsing and access of reports by users. Here, report users who experience the system first-hand should have primary consideration.

For example, you may decide to deliver the entire reporting system in a way that is very quick and cheap, but makes it clunky and expensive to add new reports. Or you may deliver a system that is an absolute pleasure for users to view their reports - on those occasions when it works. The inherent tension between sponsors, developers and users will be played out in the trade-offs the requirements analyst makes. Understanding what has been before - and why it is no longer - will help.

The flow of information through an organisation is extremely political. In addition to turf wars and ownership disputes, changes will be resisted and have unpredictable consequences. You should anticipate grief and hassle when it comes to defining even basic concepts such as *customer*, *employee*, *sale* and *order* as they will mean different things to different people in your organisation.

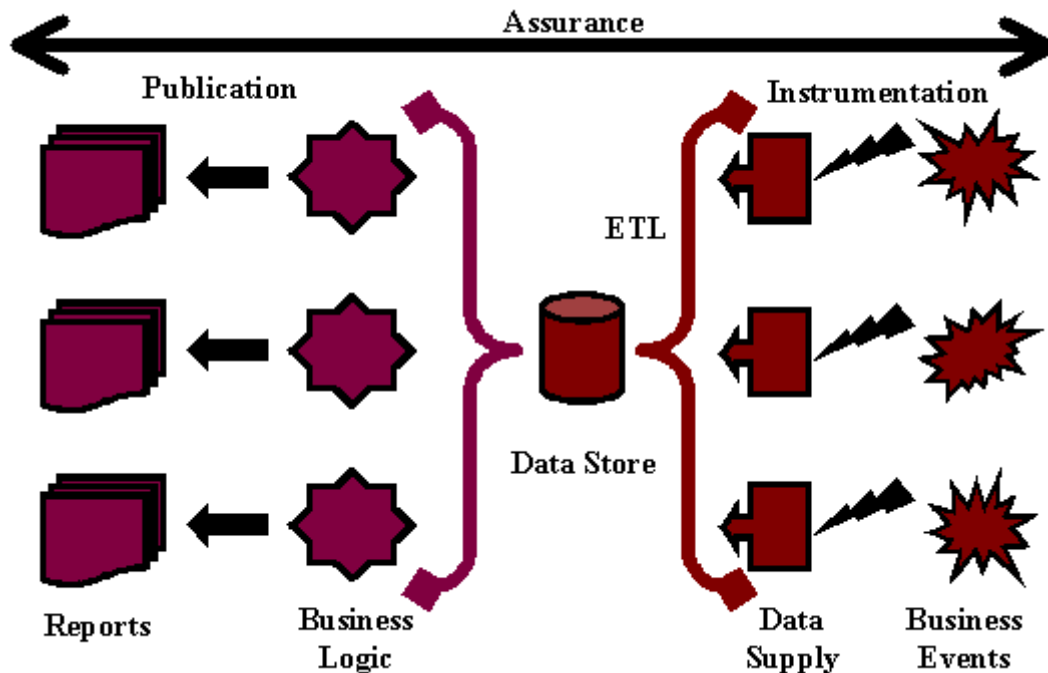
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## Components . . .

### What Makes Up An Enterprise Reporting System?

While no two environments are going to be the same, there is a generic pattern that is common across organisations and technology architectures. A map or overview is provided here:

## Overview of Reporting System



Note that report user needs (or business requirements) go from left to right, while data flows back from right to left. As such, the assurance process covers the entire value chain and moves back and forth, ensuring that reporting requirements and information delivery are properly aligned.

## Components of Reporting System

These enterprise reporting components are described below:

- **Instrumentation** - A device that measures some aspect of the real-world as events and records them.  
*Examples:* Cash register, web server, handheld GPS, thermometer, card reader.
- **Data Supply** - A system that takes recorded events and delivers them reliably to another system. The data supply can be "push" or "pull", depending on whether or not it is responsible for initiating delivery. It can also be "polled" (or batched) if the data are transferred periodically, or "triggered" (or online) if data are transferred in case of a specific event.  
*Examples:* Logfile FTP script, SQL process, EDI, web service.
- **ETL** - [Extract, Transform and Load](#). The step where these recorded events are checked for quality, put into the appropriate format and inserted into the data store.  
*Examples:* Most [datawarehouse](#) and [Enterprise Application Integration](#) (EAI) vendors sell this as part of their suite.
- **Data Store** - The repository for the data and metadata. Could be a flat file or spreadsheet, but usually a [relational database management system](#) (RDBMS) setup as a datamart, datawarehouse, [operational datastore](#) (ODS), sometimes employing cubes (OLAP).  
*Examples:* MySQL, MS SQL, Oracle, Lotus Notes.
- **Business Logic** - The explicit steps for how the recorded events are to be converted into metrics, often implemented in a script (eg Perl) or query (eg. SQL).  
*Examples:* Minute-by-minute temperature readings yield the "monthly average daily maximum" by adding and dividing in the correct sequence.
- **Publication** - The system that builds the various reports and hosts them (for users) or disseminates them (to users). Users may also require notification, annotation, collaboration and other services.  
*Examples:* PHP, Crystal Decisions, Lotus Domino.
- **Assurance** - Any enterprise reporting system must offer a quality service to its userbase. This includes determining if and when the right information is delivered to the right people in the right way.

*Examples:* Service monitoring and alarming, user surveys, audits, focus groups, change requests and fault management.

## Interfaces

Note that usually most of these systems are already in place (in some form or other) and controlled by other parts of the organisation. For example, [Enterprise Resource Planning](#) (ERP) and [Customer Relationship Management](#) (CRM) could be *source systems* responsible for instrumentation, data supply and ETL. Also, the data store is likely used for *transaction processing* too by Finance, Sales and Marketing and HR. Similarly, whoever is responsible for [IT Governance](#) may also take a strong interest in the assurance aspects of enterprise reporting.

The extent to which these established components are a help or a hinderance will be a key determinant in the success or otherwise of your project.

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## Elements . . .

### What Goes Into Enterprise Reports?

Well, the actual tables, graphs and other elements are up to you. But I can give some pointers on the kinds of things that are generic:

#### Elements of Reports

- **Title** - You need both a long (descriptive) and short (simple) title for each report.
- **Report ID** - Should be short and unique, and allows users to specify exactly what report they're looking at. These IDs, titles and other labels may need to apply to sub-reports and report elements too (eg. graphs and tables). Working out a sensible scheme can be very demanding.
- **Appearance** - Ideally, the reports should fit with your organisational colour scheme, fonts and layout and be badged appropriately. Make sure the colours are [websafe](#), printer-friendly and acceptable to the colour-blind.
- **Sources** - You need to specify the source systems for each report.
- **Dates** - Include the date of the business events, data collection, report production and report presentation. Most likely, they will all be different dates and will help users assess the timeliness of it.
- **Report Owner** - What is the name of the person who owns this report? (That is, the person responsible for getting value out of it.)
- **Report Description** - A few sentences describing the report, who should use it and for what purposes will be very helpful.
- **Definitions** - This is where you explain what events or entities are being counted, and what calculations are used to derive new figures. For example, for "New Accounts per Month" you would need to specify whether that includes eg test accounts, re-activated accounts etc. Also, is that per calendar month, or every four weeks?
- **Legal Notices** - You should put in any copyright notices, disclaimers. Also, specify the level of confidentiality - is this report secret or commercial-in-confidence?
- **Quality Status** - You should flag whether a report is draft, provisional, accepted, amended etc.
- **Contact Details** - Put the name, telephone number and email address of the person for queries about the contents of this specific report (usually the subject matter expert in your organisation).

#### Element Usage

Wondering when to use pie charts, when to use column graphs and when to use tables? If you're serious about presenting high-quality reports to sophisticated information consumers, then you have no recourse but to read [Edward Tufte's](#) book: [The Visual Display of Quantitative Information](#)

## Publishing . . .

### What Do I Need to Consider When Publishing Reports?

Most knowledge-workers can knock together a spreadsheet and automate it to spit out neat-looking reports. What turns a chart or table into a high-quality management report is the *publication process*. This has little to do with technology and a lot to do with effective management. What follows are some items to consider and discuss with key stakeholders, broken down by *Technical Architecture, Publishing Environment and User Experience*:

#### Technical Architecture

- **Platform** - It's important to be clear what platforms will be used to access the reporting application. What needs to be supported in terms of network bandwidth, response time, screen-size, colours, operating systems and other software, processing grunt, memory and so on? People will be most unhappy when they discover they can't get the whizz-bang new Flash-based reports on their Blackberry.
- **Delivery Method** - You've still got to deliver the file to a user's machine. Broadly speaking, you can employ "push" methods (where the reports are pushed out to users via eg email) or, more commonly, "pull" approaches (where users initiate the request). Various methods are employed including HTTP, FTP, RSS and SQL. Depending on your IT environment, reports can be accessed by sharing hard disks. And don't forget SneakerNet - copying the reports onto a CD, floppy disk or flash disk and physically carrying it around.
- **File Format** - In a similar vein, specify the acceptable file formats for reports. This will determine what applications can read the reports and what functionality can be incorporated. Common types include plain text (everything), csv (spreadsheets), HTML (web browsers), XML (specialised software), PDF (Adobe Acrobat) and XLS (Excel).
- **Availability** - In terms of internet publishing, it's natural to think about 24/7/365 ie reports are available all the time. However, talk to any engineer and they'll tell you that 99% (of that time) is definitely doable, but that "five nines" 99.999% is unachievable - and unwarranted - without a NASA-type effort. Since we're talking about management reports, it is reasonable to restrict the uptime to normal business hours (say, 8am to 6pm, Monday to Friday), and downtime (planned or unplanned) of even half a day or more should not be a calamity for your organisation. If delays or outages like that are not acceptable, it's a sign you're instead dealing with *operational* reporting.
- **Dimensioning** - Chances are your reports have to reside on a computer somewhere. This means you need to think about network connectivity and storage space. Before you rush out and buy something, think carefully about (a) How many reports are we talking about? (b) How many users can we expect? and (c) How much growth are we expecting? You'll need to get out an envelope and work out how much disk space to purchase (allow for storing various logs, datasets, reports, plus archives). Next, for network connectivity (bandwidth) you'll need to gauge the peak throughput - start by estimating the maximum number of simultaneous users and then multiply by the maximum individual download speed. I'd suggest that a particular management report shouldn't take more than 30 seconds to view (including query time, network latency and rendering delay). You can do more fancy things with queuing analysis, but this should suffice for most purposes.
- **Business Continuity** - While there's a range of backup and fail-over hosting solutions on offer, the tricky bit with business continuity planning is get a handle on how serious outages really are. For management reporting, it's unlikely that an hour or two of downtime will send the business broke. Rather than pumping cash into hosting your reports in converted ICBM missile silos on three continents, you're better off following sound backup practices (store them off-site and regularly test your backups!) and having a "Plan B" for production of critical reports (by hand, if required) and delivery (email or - if desperate - hard copy mail outs).

## Publishing . . .

### What Do I Need to Consider When Publishing Reports?

We continue to suggest reporting requirements, broken down by *Technical Architecture*, *Publishing Environment* and *User Experience*:

#### Publishing Environment

- **Archiving** - This is where you preserve a "snapshot" of the reports at a specific point in time. While everyone wants this, you need to ask them: Why? Is it for auditing purposes? Business continuity or disaster recovery? Performance reviews? Billing and legal disputes? Corporate history or biography? Understanding this will help determine what your archival needs are (eg source data, access logs or just reports?). This will also help work out the duration of different reports and datasets. You'll also need to check what your local laws are, and, if you're working for a tobacco company, your \*ahem\* "[document retention policy](#)". Burning CDs may not be acceptable if you need to keep data for seven years. And remember to regularly test your archives - the time you need to use them is the wrong time to find out the disk is bad.
- **Data Quality** - This is the hardest bit to get right, principally because no one wants to take responsibility for it. Worse, it means different things to different people! Best practice in this area involves getting people to accept roles like business owner and data custodian (or data steward). Most report users have a very unsophisticated view of the data supply process and are unable to distinguish between problems with the data and problems with the report. This can be very damaging to the credibility of the reports, especially when starting out. In turn, many people responsible for day-to-day operational (source) systems are uninterested in providing high-quality data for management reporting. Brokering agreements between these parties requires a blend of technical acumen and business savvy. Specifying the agreements in a contractual form (eg service level agreement or project dependency agreement) is next to impossible owing to the measurement problem. But, as a starting point, pick *complete*, *accurate* and *timely*, then go add your own - there are well [over a hundred data quality dimensions here](#)!
- **Security** - The point of security in this context is to ensure that the right reports are only seen by the right people. The three goals are *confidentiality* (no eavesdropping), *authentication* (no unauthorised access) and *integrity* (no manipulation). Typically, this is achieved with username/password login and access control lists (ie specifying whether each account allowed or denied access to a resource). You need to decide whether to do this on an application-level, report-level or dataset-level. Also, it is worthwhile doing a risk assessment to rate the different likelihood/severity of security breaches, for each report.
- **Auditing** - In general, the auditing requirements of management reporting are moderate. This is because they are not transactive: customers (and suppliers) usually aren't billed (or paid) based on management reporting numbers. However, depending on your organisation, management may attract bonuses and penalties based on the information and hence, the figures may be in dispute. As a starting point, you should store source data (eg log files) and business logic (eg perl scripts) separately, not just the results. This is because the way that certain statistics or metrics is derived may change over time. Also, continuous disclosure to managers will help get them comfortable with the figures, rather than getting an unexpected rude shock at the end of the reporting period. Another important link in the audit trail is user access logs (either web, email, PC etc) - who has seen what reports when? These may prove crucial during blamestorming.
- **User Administration** - Any reporting system worth its salt must allow for users to be added and removed and their permissions (to reports or data sets) updated. There are (broadly-speaking) two different ways of doing this: bureau and delegation. In the first model, a central authority takes applications, assigns accounts, handles user requests and queries and is generally responsible for the seamless matching users to reports. The other model has a root "super user" who then delegates certain permissions to other users - including permissions to create other user accounts. The limitation with the first method is that you really need to designate an admin person to run it all. The limitation with the second method is that it only works for very hierarchical organisations.

- **Usage Monitoring** - There's little point in rolling out a reporting system without any idea of whether or not its being used. Further, you may have security and audit requirements that mean report generation and accesses have to be logged. In any case, the best approach is to begin by defining success (or failure) criteria linked to the business case, and then looking for recordable events. Example events include report publication, report views (and other interactions), user account creation, logins and session times. Examples of relevant metrics might be total report count, total user accounts, views per report, views per account, time between logins and report views per session.
- **Privacy** - Clearly, the specific privacy requirements depend on your jurisdiction. But, broadly speaking, personally identifying information (such as names, phone numbers, credit card numbers, social security and other government IDs) needs to be handled with extreme care. This applies to both customers, staff, suppliers and other parties. Since most reports deal with aggregated data, it is probably only exceptional reports that include this. In fact, you really need to consider whether or not management needs to see this type of information *as reports* at all. For example, in some cases it is not lawful to use government identifiers as keys in your information systems. To manage these risks properly, you need to understand the implications of privacy breaches: loss of reputation, legal expenses, fines and penalties and possibly jail-time for senior managers! Regardless of where you are, the [National Privacy Principles](#) (in Australia) are an excellent framework to follow.
- **System Support** - Given the complexity of typical enterprise reporting environments, comprising of many interacting sub-systems, with data feeds and reports linking different parts of your organisation, someone needs to take responsibility for making sure it all happens each day. This might not be a full-time job, but report users and data suppliers need to have someone they can contact to handle enquiries, problems, change requests, troubleshooting and other issues as they arise. Getting management support to recognise the need for (and hence fund) such ongoing work is an important part of the business case for reporting projects. It's tempting to outsource this function to a commercial IT helpdesk, but given the organisational-specific nature of enterprise reporting, it's hard to see how this could be done with the required efficiency and effectiveness. A better option may be to have a central person/unit responsible who can call upon your in-house IT resources and subject-matter experts in the relevant units as required.

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## Publishing . . .

### What Do I Need to Consider When Publishing Reports?

We continue to suggest reporting requirements, broken down by *Technical Architecture, Publishing Environment and User Experience*:

#### User Experience

- **Navigation** - Report users need to be able to select one report out of a larger set. If you have more than, say, ten reports it is not sufficient to just present a great big list of titles and invite users to click on one. You will need to implement a navigation mechanism, such as a nested heirarchy. Figuring out a sensible way of doing this (eg. grouping by function, department, report type, user type) is an art in itself. Also, you may need to provide some sort of search facility, since users may have access to more reports than they can really comprehend. This leads to the question: search by what? Title? Subject? Date?
- **Report Parameters** - Depending on the contents, users may expect to be able to select different parameters of the same report. For example, they may wish to modify start and end dates, or include/exclude certain regions. When allowing users this functionality it is important to ensure that all possible combinations of parameters are valid (won't break the system) and meaningful (won't mislead users). Also, at some point parameterisation and navigation can become blurred and confusing for novice users.
- **Preferences** - Sometimes users may require the ability to modify how information is presented to them for a particular report. For example, changing the column order in a table, or the colour of line on a chart. While this empowers users, it can also be abused by report designers by absolving them of the



responsibility to find out about the underlying user needs. In understanding why a user wants to reverse-sort a certain table by date, a report designer can better support them in their work.

- **Fault Reporting** - Let's face it: any real-world system of even modest complexity is going to have faults or failure. You need to have mechanisms in place to capture these events and track them over time. This will help prioritise repairs or changes, gauge the impact (extent and severity) on users and, ultimately, the success of the initiative. In addition to the usual system-level logging and exceptions that modern IT environments provide, you also need to consider those failure events which, by their nature, cannot be logged. Depending on scale, automated "user-experience" monitoring by bots may be a good idea. But there's no substitute for keeping your ear close to the ground and listening to their concerns directly. Hence, formal (or informal) user surveys are the way to go.
- **Change Request** - It would be overly optimistic to assume that the reports will be perfect on the first go. Or that reporting requirements won't change over time. To recognise this reality, you need to have a process to allow report users, data suppliers and other stakeholders to lodge change requests. This should include (at least) the following elements: reason for change, impact analysis, agreement on who's going to pay for it, cost estimate, priority, roll-back plan, notification/approval plan. Changes can be politically fraught when multiple users access the same report eg Making subtle changes to the business rules used to derive a key business metric. In this case, a clear understanding of who owns (and pays for) the reports is paramount. Remember, he who pays the piper, picks the tune.
- **User Training** - An often overlooked element. Users need to be explicitly told - or even better shown - how to access their reports and use the navigation and other features to get the most out of the reporting application. It would be a travesty to waste a large amount of your organisation's time and money on a project only to see it fail for the sake of a few hours of instruction to the people meant to use the reports. Beware project managers or vendors who deny the need for training on the grounds that the interface is "intuitive" or "just like the last system". The correct response in this situation is "oh good - then the user training will be a breeze."
- **Usability** - Many people, especially in the finance and accounting community, neglect the usability of their reports. This may be because they have "standard" ways of preparing and disseminating information that is so in-grained that any problems outsiders have interpreting it is regarded as "their problem". The danger is that important information is misunderstood or its significance is lost on a wide-range of decision-makers. Hence, there's no substitute for a properly conducted usability study. Ensuring that subsequent reports comply with usability guidelines and standards is the best way to monetise this investment.

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## Value . . .

### How Can I Use Reporting to Create and Deliver Value?

In this section, we address a few topics that keep coming up as being the hardest - yet most important - ones in implementing reporting projects. They've been organised into two parts: those concerning *value* and those concerning *quality*. In each case, there is a general discussion about the "textbook theory" of how this stuff should work, and then practical considerations of actually doing this in the organisation. These are not particular technological or project issues, but rather those dealing with the human and organisational dimensions of a reporting project.

#### Economies of Scale

Getting an initiative for enterprising report off the ground is a challenge because many people will not see the value in it. Simply put, people will not regard the cost (including time, risk, hassle) as worth it. To be fair, reporting projects can be expensive, disruptive, prone to failure and likely to inconvenience stakeholders (report users and data suppliers) - especially when displacing legacy systems.

The best reason (in fact, the only reason) to deliver a reporting solution is that the alternative is worse. Of course, coming up with a reasonable set of alternatives is no mean feat in itself; the list mentioned earlier under Rationales is a good starting point. In order to understand (and convince others) of the benefits of a

central enterprise reporting function within your organisation, you might wish to consider the twin "[economies of scale](#)" of report *production* and *consumption*. Here, we understand "economies of scale" to mean that the *average* unit cost is lower (ie cost of producing each report, cost of publishing each day/week, cost of viewing a report or cost per user). Further, the *marginal* unit cost is lowered too: in other words, the cost of the  $n+1$ th report (or user) is lower than for the preceding one. Also, as we add users and reports to the system, the benefits realised increase due to synergies of the [network effect](#). Hence, consolidation is the name of the game.

## Report Production

Broadly speaking, a case can be made for rationalising the various reports in your organisation under one organisational unit. Given that you're already producing a set of reports anyway, the benefits of producing them through the one reporting environment (as opposed to a piecemeal, scattered or ad hoc approach) are given here:

- **Platforms** - Using one platform for all your reporting means that you will get better utilisation of existing hardware, software and networking assets. You will also better manage the uncertainty in forecasting demand and dimensioning. And, you'll get better rates on future purchases through "buying in bulk" (volume discounts). Operating costs become more visible, and hence have a better prospect of being reduced. You can make savings through reducing the number of interfaces (if your systems share data at all!), sourcing data once and once only, stopping repetition or redundancy of components and driving up the reliability of your system.
- **Processes** - You can expect large productivity gains if you have a unified process for building, generating and publishing reports. Rather than having multiple report builders operating in isolation, requesting the same data from different suppliers (or the same supplier), dithering about how to do things or from whom to seek approval and badgering management for decisions and sign-off, a tight, well-defined process allows subsequent reports to be rapidly defined, prototyped, deployed and monitored. Additionally, the organisation will be able to see synergies, overlaps and conflicts if all reporting is handled by a single unit.
- **People** - Getting the right mix of skills and knowledge to deliver a quality reporting function can be difficult. Once you have those people in place, you want to get the maximum out of them. Whereas a diffused, ad hoc approach means that corporate knowledge about reporting is dissipated, fractured and likely to be lost as staff move on, a designated reporting person/unit means that each new project, data set or report adds to the knowledge base. Being a specialised function, you want to concentrate your reporting skills and knowledge, not spread it thinly throughout the firm.

## Report Consumption

On the flip side, their gains to be had for report users in have a single, consolidated reporting function - beyond not having to remember multiple usernames and passwords! Here, we list some arguments for these benefits:

- **Sharing** - The primary benefit for report users is that information can be shared. Rather than just having one reporting application for sales, another for service, another for marketing and so on, by unifying these into a single reporting environment, users from the different departments can access reports across the whole enterprise. Not only does this reduce the silo-mentality in larger organisations, it also allows for the creation of cross-functional metrics and reports: instead of just focusing on marketing numbers, the marketing department can be aware of how their metrics impact on, eg, sales (perhaps using cost per lead and conversion rates). Breaking down these barriers allows for much better alignment of individual manager's goals with the organisation's goals.
- **Standards** - Centralised reports means standardised reports. Not only does this make for faster more reliable development, but it also helps report users come to grips more quickly. For example, standardising report navigation, naming, layout, formatting and other reporting elements will help users who are familiar with their area's reports when they come across unfamiliar reports. Rather than having to spend time learning how to use a new system, users can straight-away absorb the information and act accordingly. Similarly, standardising on the business logic (eg definitions of tricky

concepts like "customer", "average holding time" or "month") means that users won't run the risk of making a mistake by misinterpreting a (seemingly) familiar term.

- **Support** - Lastly, report users will invariably have questions, suggestions and objections that need to go somewhere. By dealing with a single person or group who handles *all* of their reporting needs, significant improvements can be made over having each report user chasing down multiple providers. You can expect streamlining, elimination of redundancy and gains to quality and reliability from making one entity responsible for reporting. If nothing else, it gets rid of "wobble room" and buck-passing if there is no one else to blame!

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## Value . . .

# How Can I Use Reporting to Create and Deliver Value?

## Motivating Stakeholders

OK, this makes a pretty compelling case for consolidating your organisations existing reports. But what about initiating new reports? More fundamentally, why do we even have enterprise reporting at all? Perhaps the simplest "textbook" answer I can give is: it helps solve the [\*Principal-Agent Problem\*](#). The idea here is that one group of people (the Principals, or owners of your firm) get another group of people (the Agents, or managers in your firm) to do work on their behalf ie run the business. Naturally, the Principals want this done in a way that best suits their interests (most likely: maximising profits and minimising risks, subject to legal and ethical requirements). How do the owners motivate the managers to do this? Well, they use incentives like share options, commissions, bonuses, the (veiled) threat of sacking, references and a host of other methods. Most of these methods require the owners to monitor the performance of management to make sure they're doing a good job, making the right decisions and generally doing well. Enterprise reporting is a crucial ingredient in ensuring the managers' behaviour is aligned with the owners' interests.

## The Owners' Perspective

Enterprise Reporting can help owners (or perhaps external stakeholders like taxpayers or regulators) by lowering the monitoring costs associated with aligning management's interests with the owners'. For example, suppose a hot-shot new manager on a generous profit-share scheme is considering opening a new product line. Over the three years of her tenure, it may boost sales and help her get promoted and earn hefty bonuses. On the other hand, it may cannibalise sales from other products, so over a five or ten year view, it's a bad idea. (This is sometimes called the investment time horizon problem.) So, during business case formulation, she has an incentive to downplay the longer-term loss of sales, perhaps through making unrealistic assumptions and burying negative sales figures. Enterprise Reporting is essential here to *test the business case*, that is, track the assumptions (inputs) and predictions (outputs) of new initiatives. If the owners piped up and insist on regular ongoing reporting linked to performance bonuses, the hot-shot manager will not try to hoodwink the owners in this way.

## The Managers' Perspective

Many senior managers and contracted labour have a portion of their remuneration "at risk" or contingent on performance. Sometimes, this is hidden (for example, if sufficiently bad performance means the firm folds and you're out of a job). Enterprise Reporting - especially with leading indicators - can help them perform well and "make their numbers". Another observation: management is often competitive even within an organisation and fraught with office politics. If managers are held accountable for their decisions by having their results published internally (to their rivals), then it becomes much harder to hide consistent under-performance. Up-and-coming managers will see that weakness as an opportunity to "make their mark".

## Lessons for Enterprise Reporting

- **Test the Business Case** - Ensure that the assumptions and predictions of all major decisions are tracked. Owners would be foolhardy to approve an investment plan that lacked any real means of effective monitoring. So make sure that the reports can be used to keep management honest.
- **Give Reports Teeth** - Don't just report on the figures; report on how whether or not the figures are where they are supposed to be. For example, if a proposal or plan promises that a product will have 10% penetration after 6 months, then set that as a target (or threshold) on the report and tie it to a person. Also, making that mean something to the decision-maker's remuneration.
- **Don't Be Shy** - While it may not be possible - or even desirable - to link KPIs and bonuses to everything the firm reports on, don't discount the power of pride and shame. By opening up the reports to a wide readership (with business owners' names and targets clearly displayed), managers' reputations are put on the line. This is a less crude instrument than bonuses and can help motivate managers to think like owners.

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## Quality . . .

### How Can I Manage My Suppliers and Delight My Users?

It's the role of an organisation's leadership team to understand how Enterprise Reporting contributes to the *value* of the firm. As we've seen, they are acting on behalf of owners (or stakeholders), who expect their investment to be managed in their interests. The next level is those managers responsible for implementing the Enterprise Reporting environment, and their focus is on *quality*.

#### Adoption, Usage and Success

Understanding, defining and measuring the quality of the entire Enterprise Reporting function is a very difficult undertaking. The primary difficulty is getting agreement from the various parties as to what "quality" means. The second difficulty is determining whether Enterprise Reporting is a product or a service. The best tactic is to get a handle on these different perspectives, so that arguments can be couched in terms that relate to each stakeholder's view.

First of all, let's introduce a model of how quality and value interact in an Enterprise Reporting system. (Here, we use system in the broadest possible sense, spanning platforms, processes and people.) The following diagram encapsulates a well-known and widely-deployed model, known as the Delone and Maclean Information Systems Success Model:

 IS Success Model

Source: [ISWorld](#) - [IS Effectiveness](#)

In a nutshell, quality is conceived as having two parts: information quality (content) and system quality (delivery). Quality has a bearing on impact (value-creation) through usage, which in turn is limited by user satisfaction. Now, the key determinant here is *discretion*: to what extent are users actually opting to use the Enterprise Reporting system? This is the crucial but often unasked question in most organisations.

Users of some Enterprise Systems enjoy very little discretion, for example people working in call centres simply have to use the contact management or CRM systems they're given. Similarly for people processing invoices and the like through ERP systems. Reporting, though, is quite different in that it is typically highly discretionary. Let's look at some of the obstacles to using the designated system.

#### Obstacles to Success

- **Ignorance** - Users are simply not aware of the reporting system, the reports or information it contains, or that they are meant to be accessing reports.

- **Apathy** - Users are aware of the reporting system, but choose to not access the reports. They believe any benefits they derive from doing so will not offset the costs. This belief might not be explicit, and might not be true.
- **Delegation** - Users may rely on others to monitor their reports for them, and notify them if anything important or interesting crops up.
- **Substitution** - Users are consuming reports, but from another source - typically the old reporting system that was meant to be decommissioned, or perhaps an underground "skunkworks" system comprising a mishmash of spreadsheets, desktop databases and emails.

The astute reader might have noticed that these obstacles constitute a ladder - problems at the top of the list are potentially easier to diagnose and solve, while the ones at the bottom become more intractable. Typically, users might be at the different levels for different aspects of the reporting system. An important part of the quality function is to assess users' position on this obstacle ladder, and implement strategies to migrate them off it and into getting the most out of Enterprise Reporting.

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## Quality . . .

### How Can I Manage My Suppliers and Delight My Users?

#### Diverse Perspectives

Before deciding that failure to use your firm's expensive new reporting environment is a disciplinary matter, it's worth remembering that users may have good reason for avoiding the reporting system. After all, the highly discretionary nature means that their perceptions of quality matter! So, let's look at two different views on what quality means.

The first definition is *Conformance to Specifications*, which takes the view that reports and the reporting environment are specified (with tolerances). The actual reports are compared against the specs and any differences are deemed *deficiencies*. Assessment tends towards objective measures such as defect rates and uptime. This view seems to fit well in work cultures with a strong technical focus, such as that found amongst people with a background in engineering and accountancy.

The second definition is *Meeting (or Exceeding) Customer Expectations*. Here, the referent (ie yard stick for comparison) is not an ideal report, but what the actual information consumers are expecting before they access their reports. Under this view, quality problems aren't as much defects as they are disappointments. Here, quality is better assessed through focus groups and interviews, and perhaps subjective measures such as surveys using [Likert scales](#). As a crude generalisation, this view is prevalent in work cultures where people have a background in marketing, hospitality, education and other "people-oriented" disciplines.

As a practical note, it is easier to strike agreements with data suppliers and tool vendors using the first perspective (objective measures of deficiency). This is because the contracts and other agreements require objectivity. (They may not measure the right thing, but an independent third party can agree on the measures!) On the other hand, when assessing the usability or otherwise of reporting systems and features, the second view (subjective perceptions of disappointments) is far more likely to strike a chord with end-users and the developers actually building the interfaces.

Now, the other perspective to consider is: How do report users understand the reporting function? Do they see it as a product or a service? This will frame their quality assessment, and hence propensity to use the reports. Typically, users in larger organisations will see it as *reporting* - that is, a service. Consequently, their expectations are different: if they forget their password, or dispute the source data, or don't understand a trend line, they want to be able to speak to a person to resolve their query. Users in smaller organisations are more inclined to see the reporting function as a factory for producing a product: a set of reports. Consequently, they take responsibility for getting value out the information. The difference is like that between the phone book (a product) and directory lookup (a service).

## Quality . . .

# How Can I Manage My Suppliers and Delight My Users?

## Quality Assessment

Note that the "spec/defect" quality view of quality can fit with both information-as-a-product and information-as-a-service, as can the "disappointment" view. This is made explicit in the PSP/IQ model, developed for understanding Information Quality:

	<b>Conforms to Specifications</b>	<b>Meets or Exceeds Customer Expectations</b>
	<i>Sound Information</i>	<i>Useful Information</i>
<b>Product Quality</b>	<ul style="list-style-type: none"> <li>• Free of Error</li> <li>• Concise Representation</li> <li>• Completeness</li> <li>• Consistent Representation</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate Amount</li> <li>• Relevancy</li> <li>• Understandability</li> <li>• Interpretability</li> <li>• Objectivity</li> </ul>
	<i>Dependable Information</i>	<i>Usable Information</i>
<b>Service Quality</b>	<ul style="list-style-type: none"> <li>• Timeliness</li> <li>• Security</li> </ul>	<ul style="list-style-type: none"> <li>• Believability</li> <li>• Accessibility</li> <li>• Ease of Operation</li> <li>• Reputation</li> </ul>

Source: [Information Quality Benchmarks: Product and Service Performance](#)

All items here should be assessed. Items in the first column lend themselves to objective measures, either continuously (automated systems) or during periodic audits. The units are often reported as percentages (ie defect rates) and thresholds can be set by reference to the formally agreed specification (or service level). Items in the second column cannot typically be measured objectively, and so must be assessed through surveys, feedback (such as complaints/compliments) or user interviews/observation. Setting thresholds for these less-tangible elements often requires benchmarking against best-practice. It's an unfortunate fact that this second column tends to get ignored due its difficulty, while it is an absolutely vital part of the process.

The final quality assessment - and one that is especially important for high-discretion systems like Enterprise Reporting - is usage monitoring. As is often said, people vote with their feet ie their true preferences are revealed through their behaviour. It is imperative that any quality assurance function includes detailed monitoring, tracking and analysis of which users, reports and features are being used. Ideally, this should be compared against (known) user alternatives, such as legacy reporting systems and external information sources.

## Lessons for Enterprise Reporting

- **Understand and Appreciate Users' Views** - The different report users will have different views on whether reporting is a product or a service. Some will assess quality as conformance to specifications

while others will see it in terms of meeting their expectations. You need to be able appreciate all perspectives to meet their needs.

- **Assess Quality of Content and Delivery** - Be prepared to measure aspects of system and information quality using a variety of techniques - quantitative and qualitative, objective and subjective. The breadth and depth of this understanding will limit your ability to implement improvements.
- **Monitor, Analyse and Report on Usage** - In your rush to monitor the reporting system itself, don't forget that it's actual usage that creates value. You need to gather statistics and anecdotes on how users adopt the system. Like any enterprise initiative, the Enterprise Reporting function itself needs to have a well-thought through set of reports linked to accountable managers.
- **Remove Obstacles to Take-Up** - Armed with this insight, identify the key obstacles for adoption and try to move users down the ladder. If you can link quality assessments with usage monitoring, you can evaluate the success of initiatives for driving take-up (eg. awareness, training, incentives). This means you can target and prioritise the initiatives accordingly.



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