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Data governance — Protecting and unleashing the value of your customer data assets

Stage 2: Fixing the priorities: Increase revenues and profits by raising your data quality IQ

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Abstract

Many organizations are waking up to the fact that customer data are a valuable corporate asset that needs careful protection and its value actively managed or 'governed'. In the last edition of the *IDM's Journal of Direct, Data and Digital Marketing Practice*, I made the case for investing in your customer data and outlined an effective approach for assessing your data capability and maximizing the long-term value of your customer data assets. With the case made for data governance and treating customer data as a key business asset, this second paper (in a series of three) focuses on how organizations of any size can significantly improve their data quality and begin to use their data for greater intelligence to drive successful business strategies. It focuses on fixing the key priorities that are likely to be closely associated with data quality and are likely to deliver the greatest returns. Without accuracy, an organization's key asset, its customer data, could become a major liability. This paper explains the strong links between data quality and business performance.

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The need for this paper — Introduction

Customer data is a valuable business asset that have received less management attention, resources and business process than are applied to other value-driving parts of the organization.

Make the most of your data assets. Continually improving data quality and upping the intelligence of your business information will have a profoundly positive impact on the performance of your organization.

Data quality efforts are, by and large, focused on ensuring data within systems meets the system specifications. If this is your only approach, your organization may be suffering from a lack of

information, even though there is a lot of data in your databases and the majority of that data meets the requirements of the systems that were built to utilize it. Without taking a more intelligent approach to data quality, you will overlook the major component when making improvements — the business.

The data in those databases belongs to the business. It is created by them, acted upon by them and, ultimately, its quality, or the lack of it, is determined by them. Trying to cleanse data using software alone, without consulting the business about what makes good quality information, could be a waste of time and money. To build a successful programme of continual quality improvement, you need to involve all three key elements of data governance — people, process and technology. Missing out on one of these could lead to failure.

The aim of this paper is to help you understand

- the difference between data, information, knowledge and wisdom;
- the impact of inadequate data quality in terms of direct costs, brand damage and missed opportunity, as well as why data quality is important to your organization;
- fully understand your organizations' current capability to deliver high data quality. This paper details the data quality IQ maturity model, which enables you to plot your position and monitor your progress as you strive towards 'managed' and even 'optimal' quality.

The paper starts by distinguishing between data, information, knowledge and wisdom.

The difference between data and information

Wise up — What can be done with the right information?

The right information can enable your company to be truly wise. A wise company is one that has clear understanding of the importance of their data. They will see that data forms the building blocks enabling them to meet their business goals and to make the right decisions, based on clear, reliable information and the knowledge gained through experience and investigation.

A wise organization acts with confidence and is rarely found lacking in credibility. Customers will learn to trust a company that prides itself on creating and maintaining high-quality knowledge about them. They will stick with that trusted brand, even when times get tough.

To become wise, an organization needs to understand the basics about data and how that data becomes information that then becomes knowledge and ultimately wisdom.

This is a natural progression that is described in the following illustration (Figure 1).

The journey to wisdom

Data⇒

Information⇒

Knowledge⇒

Wisdom⇒

Actions and Decisions

Figure 1: The journey from data to wisdom

As you can see, as a company moves from data to wisdom, the data value increases greatly until the organization is able to maximize the value through intelligent decisions and actions.

Clarifying the steps along the way

Data

Data: The raw materials

For the most part, data is simply the raw material that might become information once its definitions have been understood and once it has been interpreted according to those definitions.

Examples of data would be

- numbers in a spreadsheet;
- words on a piece of paper;
- musical notes.

The uses for raw data are quite limited without definitions and further contextual details. When it comes to customer data, its main purpose is as a starting point for learning more about your customers and your business.

Information

Information: Data defined and interpreted

Information is data in context, defined and then interpreted according to the agreed definitions and business rules. When speaking about customer information, the definitions should be those that reflect the business needs of an organization and should be discussed and agreed by subject matter experts within the various business areas involved.

Our data examples, above, when progressed to form information might become

- results in a report;
- paragraphs in a chapter;
- sheet music.

The uses for information are vast and are critical to the success of any business endeavour. The main purpose of customer information is to represent reality in a reusable format, a digitized version of that customer, so to speak.

Knowledge

Knowledge: Information analysed and understood

Knowledge is information that has been analysed and thoroughly understood by the business. To create good quality knowledge, you will want to combine and enrich the information you already have. You will make it readily accessible to those who need it, with the correct controls to ensure privacy. At every step between information and knowledge, the subject matter experts should be included in all key decisions and knowledge processes.

When our data examples become knowledge, they could now be

- analysis published within a journal;
- chapters in a best-selling novel;
- a score arranged for a concert.

The uses of knowledge are much deeper and far more valuable than those for information alone. The main purpose of knowledge is the expanded learning, understanding and interpretation of all available information.

Wisdom

Wisdom: Knowledge, fully optimized

Wisdom is knowledge that has been fully optimized, ready to enable the business to make crucial decisions and to take effective actions. Wisdom is the ability to execute marketing campaigns, determine policies concerning your customers, develop new products and services to take to market and, ultimately, to realize the true potential of an organization.

Wisdom is shared knowledge, mixed with external intelligence and business experience. It includes both qualitative and quantitative research and has the power to dramatically change a business.

When our data examples reach the deeper status of wisdom, their progression might include

- taking the knowledge gleaned from various journals to change the direction of your business;
- changing the views of a book's reader;
- an award-winning musical concert.

The uses of wisdom are limited only by an organization's reach and underlying culture. Companies that become wise become highly successful. They are also the types of organizations that have devoted employees as they tend to be stimulating and enjoyable places to work.

Actions and decisions

Actions and decisions: The keys to maximized data value

Actions and decisions are the end results of the journey from data to wisdom. They are the products of the efforts involved and are evidence that data value has been maximized.

Here are some practical examples of the actions and decisions that an organization can take when wisdom has been created.

- Ensure high levels of customer satisfaction by providing consistent messages to the right customers at the right time.
- Anticipate customer needs and offer proactive communications that are geared to meet those needs.
- Identify the warning signs of customer churn and develop policies to avoid customers leaving.

The importance of quality in the progression from data to wisdom

According to Kuan-Tsai Huang, Yang W. Lee and Richard Y. Wang in their book *Quality Information and Knowledge*

“A firm’s information represents the firm’s collection and services to consumers. Quality information is increasingly recognised as the most valuable asset of the firm. Firms are grappling with how to capitalise on information and knowledge. Companies are striving, more often silently, to remedy business impacts rooted in poor quality information and knowledge.¹”

When embarking on the journey from data to wisdom, there is one essential element that must never be overlooked — quality. It is not possible to create information from your data if the data definitions are non-existent or do not reflect business rules. Without quality information, you cannot have knowledge or wisdom. Your decisions will be flawed and actions could be costly mistakes. Data and information quality are the keys to wisdom — something called intelligent quality.

You need to bring intelligence when addressing data quality

What is intelligent quality?

The concept of intelligent quality is a new idea that reflects the end state of the well-known data, information, knowledge, wisdom hierarchy. It goes beyond how well the data fits the system specifications; it concentrates on how well the data provides for the business information needs of the organization. By looking at data from a business point of view, applying business rules and acknowledging the impact of business processes on the quality of data, information and knowledge, intelligent quality can be achieved.

Intelligent quality will form the information foundation that can then be analysed and interpreted, and on which you can add business experience and external intelligence to form wisdom.

Achieving intelligent quality — Find a senior sponsor from within the business

As with all aspects of data governance, intelligent quality relies on people, process and technology. All too often, it is the technology that

Intelligent quality: Data from a business point of view that form the information foundation for wisdom

gets all the attention and the people and process are overlooked. This, unfortunately, may result in some tentative ‘cleansed data’ but it will not provide the right business information to take an organization to a state of wisdom. Intelligent quality combines data quality and business process improvements to achieve this.

Above all, it must be stated that intelligent quality is not an IT activity. It may start in IT but it must include the business in order to be successful. All business areas that create, utilize or report on business information need to be involved. Subject matter experts need to be found and engaged in the intelligent quality programme. This is very important.

People:
Senior managers alone
can provide the right
sponsorship

Even more important is finding the right sponsorship. You may be able to get funding for an intelligent quality initiative without a sponsor. However, you will struggle to get everything implemented and to build a long-term intelligent quality environment without one. So, who would be the right sponsor?

Your sponsor must be a senior manager. Improvement processes will require changes to business processes and systems. It will also require financial, system and human resources. In fact, most initiatives will have an impact on job roles and may even require changes to entire departments. Senior managers alone can enable these to happen.

To find the right sponsor, you need to find a senior manager who is in *pain!* Unless you find at least one person, at a very high level in the company, terribly worried due to a problem associated with data, you will not get the right backing to ensure success. The worry may be about missed sales, runaway costs or may be due to an awkward mistake that has come to light in a very embarrassing way.

Finding and measuring the pain — Identifying problem areas

People:
Find the key knowledge
workers

Even if your senior sponsor is really worried, you will need to highlight the connection between his or her pain and poor quality information. If you can relate the pain back to an information quality problem, you will have the keys to getting an intelligent quality initiative underway and valuable input into that all-important business case.

In order to back up your assertions that the pain is due to quality problems, other people are needed. You may not know who these people might be and you do not really know all the problems they are experiencing. It is important to gather evidence from the key knowledge workers within the business to make the connections between pain and poor quality clear to all.

Here are some suggested ways of finding the right people and getting that evidence.

- Advertise on your intranet that you are looking for information quality problems and ask people to contact you to discuss their issues.

- Conduct lunchtime forums in individual departments asking people to come and tell you about problems they are having. Record everything that is said and keep in touch with the people involved.
- Send out questionnaires to managers within the business asking them to answer questions about information quality problems and suggest that they pass the questionnaires around to people who work for them.

Once you have accumulated all the problems, prioritize them according to the impact they are having on the business, identify the data involved in the top priority areas and then profile the data to get valuable insight. This step involves the first use of technology for your intelligent quality programme.

Preliminary data profiling

Technology:
Profile the data using tools, MS Access or SQL

If you have profiling tools, use them. If you do not yet have profiling tools, this can be achieved using MS Access or SQL queries of the appropriate databases. You do not need to profile very deeply at this point, just enough to gather evidence for your business case.

Typical queries would involve uniqueness checks, counts of nulls and duplicates, lists and distributions of values within key fields.

Assessing the intelligent quality data maturity of your organization

To do this, you will need to compare your organization against the following model (Figure 2).

As you can see, this model defines the various levels of data maturity and statements that reflect the way an organization might be acting at each level. It is based on a variety of different quality models that have existed over the past 40 years, starting with Philip Crosby's Quality Management Maturity Grid.²

Figure 2: The intelligent quality data maturity model

By measuring the data maturity of an organization, one is able to benchmark their company against others and draw conclusions on the effects the maturity level is having on the company's ability to react and make reliable decisions and the costs being experienced as a result of poor data quality.

The levels provided reflect years of research done by Larry English³ looking at thousands of companies. These levels produce an accurate picture of an organization's current and future states and also provide logical next steps to foster improvement.

A few examples are provided here.

- *To move from Level 1, aware to Level 2, reactive*
Help management feel the pain by identifying and measuring poor quality information costs
- *To move from Level 3, proactive to Level 4, managed*
Formally initiate and roll-out information stewardship.⁴

Different business areas could have different levels of maturity

It is possible to have some areas of a business at different levels so that all areas are measured separately and evaluated according to their own results. The results should also be broken by key information stream to help with prioritizing the areas in need of attention. An example of an assessment of customer information by various business areas is provided here (Figure 3).

Three things you will need to gain buy-in

To achieve long-term buy-in from the myriad people you will need to attain success, you will need three things — a vision, the visualization of that vision and the roadmap that will get you there.

A vision

You will first need to establish a vision for your intelligent quality programme. This vision should focus on the benefits that will be gained by realizing wisdom in the organization and should also highlight the relief of whatever pain your sponsor and the business are

Figure 3: Example spider diagram of customer information maturity

Process:
The vision, the
visualization, the
roadmap

experiencing. This is why it is so important to find and measure the pain as it will help to develop the vision.

Visualization of the vision

Once you have established a vision, you need to help people visualize that vision, and to do that you need to understand it fully yourself. Review the situation and walk your way through to your solution. Draw yourself a picture of this solution — literally. On the basis of the problems you have discovered and the pain they are experiencing, ask yourself the following questions:

- What systems have problems?
- What business areas are experiencing issues?
- How is it impacting the customer?
- After the improvements you will undertake, what will be different?
- What will the business area be able to do to capitalize on the improvements?

Graphically depict the answers to these questions. Keep your visualization simple so that people can hold onto it and take it away with them. Once this is complete, review it with several people in the business to ensure that your ideas are as clear to them as it is to you.

This vision will form part of a ‘roadshow’ pack that will form the basis of your campaign to get your intelligent quality initiative off the ground once you get the go-ahead.

The roadmap

It is not enough to have a vision. If you cannot show people that you can get them to that vision, you will not get the backing you will certainly need. A roadmap, including milestones with deliverables, is required to engender confidence in your ability to accomplish your improvement goals.

It is here that you must make it crystal clear that this is an improvement programme, not a ‘quick fix’ solution. It takes time to get everything under control and will need a continuing effort to ensure that the quality remains for the long term. However, good planning will reap rewards in short order. Prioritize the milestones so that the biggest problems get relief first. Include easy wins along with big problems so that you can prove return on investment quickly.

Getting started in intelligent quality — Making the case

Before you can improve quality, you need to institute an improvement programme. To get this programme started, you will need to build a business case that should focus on the problems you have seen and the methods you propose to deal with them; however, it also needs to prove its worth to the business as a whole. This means capturing the

costs of poor quality. It also means countering the claim often made that quality is expensive.

To quote Philip Crosby in his 1979 book, 'Quality is Free' —

"Quality is Free.

It is not a gift, but it is free. What costs money are the unquality things — all the actions that involve not doing jobs right the first time. Quality is not only free, but it is an honest-to-everything profit maker. Every penny you don't spend on doing things wrong, over, or instead, becomes half a penny right on the bottom line'.⁵"

Companies have created whole departments dedicated to correcting poorly captured data. In fact, these departments have become part of the very fabric of most organizations and require and receive substantial funds to make this happen. If quality principles were used at all points where data are created, altered or utilized for business purposes, the need for the 'scrap and re-work' undertaken by these departments would be greatly reduced, saving large amounts of money.

I hear you saying that it costs money to set up a quality improvement programme and that is true. However, the returns are far greater than any costs. I have yet to find an organization that did not get more than a 200 per cent return on investment from intelligent data quality that is focused on enabling the business with high-quality information that will help them to become wise.

Data quality will impact the bottom line — Whether it is good or bad

Risk of poor quality data

Poor data quality is a common problem that often has a significant impact on an organization's efficiencies and consequently its performance.

According to Gartner Group, over 50 per cent of customer relationship management and data warehouse programmes fail or do not achieve business case benefits due to poor quality data. This is costing organizations tens of millions of pounds in direct investment, management time and lost opportunities.

The benefits of good data quality

Good data quality is not just about reducing business risk. It often delivers substantial benefits in its own right.

Instead of seeing data quality as an extra cost of business, however, it should be recognized that brand values and perceptions can be positively impacted. Not least, it should be seen as an investment in an important asset, which should have a significantly positive impact on business profits and growth.

Significant consumer trust can be built through a clear, fair and positive approach to the collection and management of their data, as will proactive data quality measures and a clearly demonstrated

Poor data quality has a significant impact on the bottom line

Good data management enhances an organization's ability to cross-sell and up-sell

20–35 per cent of a company's revenue is lost due to poor information quality

commitment to improving data accuracy. An instance of incorrect data will often have a negative impact on consumer trust and can cause irreparable damage in the consumers mind.

Good data management enhances an organization's ability to cross-sell and up-sell to its customers. According to 2006 sales figures, 35 per cent of Amazon's sales are done through its recommendation system, which automatically suggests products to customers based on their previous purchases.

A major insurance company successfully reduced errors in application from 34 to 4 per cent of policies by reviewing and simplifying its data error process, leading to savings in data entry costs estimated at over £1.5 m. The organization also significantly reduced policy cancellations and cut claim overpayments by over £2 m through better data management.

There are many other examples that make the case for investing in good data quality.

According to Larry English, the costs of poor information quality could be as high as 20–35 per cent of a company's revenue. In some cases, it is as much as 40 per cent.⁶ Larry has spent most of his career gathering the background figures to support this claim. In his most recent book, he has quantified over US\$1 trillion in unnecessary costs. In some cases, quality issues have meant complete business failure.

Quantifying the costs of poor quality data

This is where your subject matter experts and knowledge workers come in. Draw on their experiences to identify costs and back this up with evidence and take measures where possible. You could find costs through structured interviews or questionnaires. You then may need to do additional queries of the data to back up the costs with quantities.

When looking for costs, there are two types — direct and indirect.

Direct costs

Some of the costs associated with poor data quality can be directly applied. They have a clear link with information quality issues. These may include

- operational inefficiencies due to incomplete, disparate data in various formats that cannot be used to meet the information needs of the business;
- wasted direct marketing communications that are the result of duplicates and inaccurate addresses in marketing databases, and, most critically, efforts involved in fixing problems, known as 'scrap and rework' — probably a company's biggest waste of valuable resources.

Where it is relatively easy to quantify 'scrap and rework' costs, it is sometimes difficult to get a company to admit that their back-office processes are not necessary parts of their business. These operations

have become ingrained in the fabric of companies and do not disappear easily. However, improving data capture and usage processes will have the desired effect, and the people working in those back offices can be redeployed elsewhere in the organization doing work that earns money, rather than wasting it.

Examples of normal business operations that are built around the need to fix data quality problems include⁷

- correction activities;
- reprocessing orders;
- returns handling;
- customer complaints handling.

Indirect costs

Not all data quality costs are immediately obvious. Indirect costs require some digging to quantify. However, these indirect costs could have a huge effect on the bottom line of an organization. Typical issues include

- the adverse impact on decision making, which may result in an inability to make decisions or, worse yet, making wrong decisions that result in failed or ineffective actions;
- a poor ability to meet regulatory requirements such as data protection and Solvency II, to name but a few;
- damage to customer perception as a result of inaccurate customer information visible through various communication channels such as a customer website;
- low employee morale for several reasons, one being frustration over an inability to meet business goals due to a lack of quality information;
- potentially brand damage when quality problems enter the public domain such as publication of inaccurate financial numbers;
- missed opportunities directly relevant to lost revenue that may be due to missed sales, customer churn and inability to target customers effectively.

Identify a pilot project

Process:
Undertake a pilot project and measure improvements to get the ROI ball rolling

You will need to prove the worth of intelligent quality, and the best way of doing that is to undertake a pilot project. Your first business case will most likely be for this pilot project, although it is possible that your sponsor might want to take matters more seriously and build a business case for an ongoing department.

If a pilot project is the route chosen, work with your sponsor to pick the pilot carefully. Make sure it is a well-known problem, that the costs are clearly understood and quantifiable with financial measures both now and after completion. Also make sure it is small enough to get done within a short period of time — 6 weeks to 3 months is a reasonable suggestion. This pilot project should include measures around the improvements to show return on investment, which will provide credibility and financial backing.

Tom Redman, in his book *Data Quality the Field Guide*, 2001,⁸ suggests looking for opportunities with the billing information chain. With so many data transfers, there are generally easy-to-solve business process issues to improve.

If you are building a case for an ongoing department to undertake improvements, you will need to clarify the roles within the department and the methods that will be used to improve quality. More about methodologies will be provided later.

Quantify the costs associated with your intelligent quality programme

Your business case will need a breakdown of all the costs you might experience in your pilot or throughout the initial stages of your intelligent quality programme, if a long-term activity is planned. This should include, at the very least, manpower, hardware, software, external resources from third parties and, do not forget, the amount of resource required from other areas of the business — your subject matter experts.

People: Manpower requirements for intelligent quality

Manpower requirements would include the following:

- data analyst(s);
- data architect(s);
- project manager;
- business analyst(s);
- data quality tool developer(s).

If you can find an information management specialist, he or she might have several, if not all, of the skills included above, and thus could be a big bonus to your programme.

If you are building a business case for a long-term department, annualize your costs so the project budget for the department is clear.

Make your case

You and your sponsor should now be ready to prepare any required documentation and then take your business case to whatever deciding body might exist in your organization. If you have the right sponsor and have quantified costs and benefits well, you should be able to get this approved and get started.

Implementing an intelligent quality programme

People; Process; Technology: Working together to create intelligent quality

Once the business case has been approved, you are ready to undertake your first improvement project. A clearly defined methodology will go a long way in creating confidence in your abilities.

The key starting point of any intelligent quality programme is what may be called a 'Forensic Diagnostic'. This is a multi-faceted approach (people, process, technology) to finding and analysing information quality problems and then identifying the improvements required.

Process:
**Listen to the voice of
the data**

Investigate

Start by investigating the extent of the data and information quality problems you have identified. You would have started this process when putting together the business case but this now goes further and deeper.

First, start off by profiling the data, again. This time, look further and check foreign key relationships across tables and duplicates within tables. This is where profiling tools can be a big help. They will do most of this for you and a whole lot more.

Review data definitions

Take a review of all the documented data definitions for the key data areas involved and compare the profiling results against the definitions. It is possible that the definitions have not been implemented according to specification. Is this because the specification was wrong and the data never could measure up?

Where definitions do not align with the actual data, discuss this disparity with the subject matter experts you have included in your improvement plans. It could be that the definitions do not reflect business needs. In this case, the definition and associated metadata needs to be changed to reflect this.

Assess data architecture

It is important to have a good analysis of the data architecture involved with the key data you are improving. Check the various relationships between entities and attributes, to make sure the relationships are identified correctly and look closely at the life cycle of the data to make sure it meets business needs.⁹

When you assess the data architecture, look to the results of the data profile as this may provide some clues to data architecture problems, as may the data definition review.

Questionnaires and interviews

Before conducting structured workshops, below, develop questionnaires and distribute these to workshop attendees and other individuals around the business who may be able to provide valuable insight into data and information quality problems. Questions would centre on data usage, data and information issues, business information needs, costs of poor quality, information customers/suppliers and business goals.

In some cases, you may want to conduct structured interviews with individuals who may not be able to attend workshops or who appear to be so key to the investigation that a one-on-one discussion is warranted.

Structured workshops

Conduct workshops with subject matter experts and knowledge workers. These workshops should be themed around specific areas of key data and should include all the individuals who have a stake in the

People:
**Welcome the voice of
the people**

quality of the data being investigated. Three distinct types of workshops should be used, each with a specific purpose.

The first is an *investigation workshop*, aimed at reviewing data issues identified when gathering evidence for the business case and also data concerns discovered during the data profiling and data definition reviews. Walk through the data profile results and discuss the data definitions with the business people involved to identify any further issues and to start to find the reasons for any problems that may exist.

The second is an *information chain workshop*. The purpose of this workshop is to map the information flows of key data through the business. Help the attendees to document the customer/supplier relationships within their organization with regard to their key data.

The third is a *root cause workshop*. Here you review the problems that have been found and work with the business to identify the root causes of the problems and start to find ways of making improvements that make sense to the business.

Depending on the extent of the investigation you have underway, you may want to combine the investigation and information chain workshops together.

Develop recommendations

Once you have completed all investigations and performed the root cause analyses, you should be ready to make recommendations for improvements. These improvements need to be based on their practicality and effectiveness with a close eye on cost and effort required to implement.

Be sure to consider all possible remedies. This should include business process improvements, as well as system and architecture changes. Data cleansing could be needed to clean the existing data, but you should combine this with a more permanent repair to the underlying issues. This will prevent a recurrence of the quality issues.

Make sure the recommendations set appropriate goals and include quick wins along with more meaty work streams. Continually stress that this is a programme dedicated to continual improvements, not big bang solutions.

Making improvements

The next step in the process is implementing the recommendations to start the continuing improvement cycle. This will involve making improvements to business processes, system changes, changes to the data definitions and architecture, data cleansing, measures for success, communications strategies and more.

The next installation of this data governance series will deal with the most likely improvements that may be required and will continue the journey along the intelligent quality data maturity model by explaining the next steps required to move from data to wisdom.

Summary key points

In this paper, you will have learnt the following aspects:

- the explanation of the journey from data to information, to knowledge and finally to wisdom;
- the benefits of having a wise organization, which include the ability to make crucial, optimal decisions and to implement trusted actions that will help your business to be more successful;
- the concept of intelligent quality that is essential for the wise organization and the importance of information and data quality in achieving intelligent quality;
- an introduction to the intelligent quality data maturity model as a method of assessing the maturity of an organization;
- the process for getting started, including finding the right sponsorship, ways to identify problem areas and methods for quantifying the costs of poor quality and financial benefits of improvements in order to build a business case;
- step by step methods for implementing an intelligent quality programme, combining people, processes and technology in a repeatable methodology.

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