This guide was prepared by CIMA's Information Management Key Target Task Force.
This task force was established by the Institute's Technical Committee to review developments in information management and technology and to consider their impact on management accounting.

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Contents

Introduction

Management Accountants are by their nature managers of information. CIMA's Information Management Key Target Task Force was established in 1998 to review developments in information management and technology and to consider their impact on management accounting. The task force concluded that there is currently a lack of understanding of the fundamentals of information management. These fundamentals should underpin the use of any technology and must be addressed before developing the technological solution. Experience has shown time after time that when the use of technology or new approaches has failed, it is because organisations have failed to follow basic principles.

With this in mind, the task force devised the Information Management Core Model described in this guide. It has five elements and four dimensions. The combination of elements and dimensions form the core model of information management which remain applicable over time. Technology may change the nature of collection, processing, storage, retrieval and exploitation of information, but the principles remain constant.

Information is a resource, and within a business environment, applied information can be particularly valuable. It is crucial to identify the right type of information at the correct level of application.

The guide explores the importance of an information management policy. Everyone, in any type or size of organisation, needs to understand the importance of safeguarding the very valuable knowledge that permeates all of its day to day operations.

Any information management system must ensure that its effectiveness is not lost as a consequence of over complexity, but also that it is sufficiently comprehensive to deliver the right degree of control.

This guide therefore aims to consider what pre-eminence in the business application of Information Management actually means, and through this;

- **Identify the role of the management accountant as an information manager.**
- **Examine the basic principles of information management.**
- **Define information management in terms of a model.**
- **Look at the importance of application.**
- **Acknowledge the importance of managing non-financial information flows.**
- **Use the model to identify information management in real examples.**

1. Pre-eminence in the business application of information management - some key messages

We have seven key messages to impart which we believe form the bedrock of pre-eminence in the business application of information management, which are in the box below. Later sections of this guide will make reference to those key messages which they address in more detail.

1. To understand business and how organisations operate in order to *identify information critical to success.*

2. To recognise that Information Management is the process of managing data so as to *deliver information that adds insight, understanding and value for users.*

3. To understand that Information Management is based on principles that remain applicable over time although techniques and technologies may change and that these *principles are embedded in a core Information Management model.*

4. To understand the different *contexts, needs, perceptions, attitudes and motives of users* in the way that information is applied.

5. To understand and be able to apply the range of techniques that can be used to *provide information to meet the specific needs of internal and external users.*

6. To be informed about and be able to *select and utilise the most appropriate tools and technology* from a well-designed form to the latest computer networks.

7. To be able to *promote and maintain a broad and balanced perspective* on how the organisation is moving towards and achieving its objectives.

2. The role of the management accountant as an information manager

Management accountants can be seen as having two primary roles in the modern organisation. The first of these can be described as the traditional *Management Accounting* role and the second is the *Information Management* role.

The traditional *Management Accounting* role involves:

Accounting for the business transactions and resources and reporting on the outcomes of the business activities in terms of performance and viability.

The *Information Management* role, which has been present prior to computer technology but which has risen in importance, involves:

Providing management information services for:
• Performance measurement
• Proactive improvement of the business
• Optimisation of resources

Both these primary roles have operational and strategic components and involve the creation and maintenance of the systems infrastructures necessary to gather, process, retain, share and apply the information stemming from and having an impact on the business activities. The roles are separate and closely related. The traditional Management Accounting role can be seen as focusing on internal information, primarily financial, and recording what has happened, whereas the Information Management role is more concerned with external information and what is happening and may need to happen in the future.

In this guide we are primarily focusing on the Information Management role.

3. Information management - the basic principles

The second and third key messages are concerned with the basic principles involved in Information Management:

KEY MESSAGE 2
To recognise that Information Management is the process of managing data so as to *deliver information that adds insight, understanding and value for users.*

KEY MESSAGE 3
To understand that Information Management is based on principles that remain applicable over time although techniques and technologies may change and that these *principles are embedded in a core Information Management model.*

Information Management is about getting the right information in the right form to the right person at the right time at a cost that adds net value to the organisation. When this happens people are able to apply their knowledge gained from experience to use the information effectively.

Knowledge is the appropriate application of information. Information is created from data. Data are composed of discrete facts that lack meaning until put in some sort of context. For example the context may be a trend or time series. This then forms useful information that may be used to form knowledge of patterns and become a reliable base for predictions.

These basic principles underpin the model described in the following pages.

4. The information management core model

Information Management has five primary elements each of which has four main dimensions. The combination of elements and dimensions form the core model of information management. The basic model outlined below is applicable in its principles to all situations of Information Management and is not affected by time. Technology may change the nature of collection, processing, storage, retrieval and exploitation of information but the principles remain the same.

The model can be used to describe the information needs of any organisation. Four distinct examples of the model's use are given as an appendix to demonstrate the universal applicability and adaptability of the model.

↓ Element → Dimension	Purpose	Content	Standards	Technologies
Gathering				
Processing				
Retaining				
Sharing				
Applying				

The model can be defined as "A five stage process for managing data in a range of formats by a variety of mechanisms that is controlled in order to deliver relevant information that adds understanding and insight for users."

THE FIVE ELEMENTS OF THE MODEL

1. Gathering
Identifying, searching for and collecting data
Gathering data may involve using a number of sources and formats. Occasionally data may be available as a by-product of another operation. Sources may be internal or they may be external such as the Internet, a reference library, or services such as CIMA's Technical Advisory Service. Some data may be explicit which means it is available from accessible sources. Other data may be tacit in that it is recalled automatically as part of a process by human beings but not necessarily written or recorded.

Information may be sourced from or conveyed by word of mouth, numbers, pictures, images, film (or video), sound recording, smell, text, action or mime. It is applied by people who use their knowledge of:

- *How* to do a task.
- *When* to do a task.
- *Why* to do a task.
- *Where* to do a task.
- *What* to do to accomplish a task.
- *Who* can do a task.

Some of this knowledge may be explicit (written or recorded as information) or some of it may be tacit (unwritten, handed down or inherent). For scientists certain principles have been codified and passed down as laws, thereby obtaining a formal status or recognition. In contrast the working practices of rural craftsmen are rarely written but handed down from master to apprentice and, in this informal way, maintained over the centuries.

2. Processing
Processing the data to turn it into useful information
Once data is gathered it may have to be processed to bring it to an acceptable standard. This means eliminating spurious data and ensuring consistency. Time stamping may be useful to ensure that it can be identified and removed if appropriate. Conversion may be applied from one measure to another, for example; gallons of whisky output from the still may be recorded in terms of cases of a dozen bottles. Data is sorted, merged and related to other data, new secondary data is calculated from primary data, and so on.

3. Retaining
Storing the information in order to allow access
Given the diverse nature of information it may be difficult to have a common key. However, it is essential to aim for a common key if the most complete picture is to be provided to the user when a request is made for information. For example sound or pictures may need to have a small amount of text attached to enable a search to be made along with other information recorded as text. Keeping retained information fresh is essential. With the passing of time data can become out of date, irrelevant or overtaken by events. Weeding out is an important aspect of retaining in some situations.

4. Sharing
Making information available; considering format, interpretation and access
Information is of limited use if it does not add value. If the cost of collecting and storing outweighs the use then there is no economic point in persisting. Similarly if the information is available but not easily accessible users will not know or bother. Availability must therefore be made known (advertised) to potential users. Output formats must be as required by, or adaptable to, the needs of users. The result is that diverse formats can all be put at the disposal of the user. Methods of indexing must be common knowledge so that the full resource is made available.

5. Applying
How to use the information to add value
Extrapolating from a base of information is a common way of forecasting the future. Knowledge of standards applied, availability of positive and negative information are all key ingredients in the application of information.

All these elements have four dimensions in the model.

THE FOUR DIMENSIONS OF THE MODEL

1. Purpose
The reasons for which each piece of information is gathered, processed, retained, shared and applied
The purpose for which the data is held is important. The level of accuracy may be less important for large-scale estimates but in other circumstances it may be critical such as in the case of medical records. Storing it in an appropriate format may save other forms of storage, for example; a picture of a complex machine may be more expressive than a long text.

2. Content

What the information includes and the form it should take

The content may include not only text and numbers but also images and sound. It really depends on the purpose of the information recording and analysis. In a musical context sound may be vital. In a medical context images of a condition may be more informative than text but numbers may demonstrate the relative incidence of cases. Data may be qualitative or quantitative. With qualitative standards due allowance may need to be made for individual opinions and assessments that may include an element of personal bias.

3. Standards

Defined standards of currency, accuracy and relevance

The level of accuracy is relative to the purpose. For example the exact population of various towns is not critical in ranking their size but if it were necessary to order preventive vaccination for each inhabitant then accuracy would be essential to avoid the risk of insufficient supplies. Scale is important so, taking the previous example, population in thousands would be sufficient for ranking but for vaccination the headcount would need to be in terms of individuals. Data can be summarised and this basic fact must be publicised to the user as to the degree applied. Indexing large volumes of data can speed searches but the basis of indexing must be clear to users as well as creators of the data. The standards will also need to cater for:

- *Timeliness*

  Information, which is available but which cannot be obtained within a reasonable and relevant time scale, is of limited use. It is probably a net cost to the organisation in terms of maintenance.

- *Reliability*

  Reliability can be assured by use of audit techniques or sampling. If this is not done users will not derive the full benefit from the resource or, in some cases, may be misled.

- *Security*

  Protecting commercial secrets may be vital and access to the information may need to be strictly controlled. Unauthorised access may lead to tampering, accidental or deliberate, with detrimental effects on the organisation.

4. Technologies

The range of technologies available

Technology is affected by time and technological progress. Techniques available today may not have been around some years ago. They may well be superseded in years to come. For small volumes of data a simple system such as a card index may remain more efficient. It is cheap, not affected by technological progress and simple to set up, operate and understand. As data volumes grow technology is more likely to become important to provide answers in an acceptable time frame. Care should be taken that technology remains the servant and does not become dominant to the organisation.

OTHER ISSUES FOR CONSIDERATION

In addition to these dimensions, the Management Accountant as information manager will have to pay attention to cost, ownership of information, copyright and authorised use of information:

Cost
Cost may be measured in terms of cash or time. Whichever measure is used there must normally be net value added to the organisation. In other words the cost of managing information must be exceeded by the value added to the user.

Ownership of information
In many cases the use of data may be quite separate from creation and maintenance of data. Care is required to ensure that maintainers understand the significance of their work and that the common aims of the organisation are placed above those of individuals.

Authorised Use of Information
It is important that the right people have the right authority to access the right information. This issue is linked to the general issue of security.

Security
This is a vast issue. As an example, the current trend for organisations to link their own intranets to the internet begs the question of to what extent organisations want to open their doors to visitors from cyberspace. The security risks of linking to the internet are considerable. Apart from allowing unwelcome access, there is also the possibility of picking up a virus in the process. Perhaps the main reason for doing it is the potential for using the international network for e-mail. What has to be weighed up in this issue, and others, is whether the advantage is worth the security risk.

Copyright
The history and development of copyright are not discussed in this guide, however, it is important to signpost the most significant; the 'Copyright, Designs and Patents Act of 1988' (CDPA 88), amended by SI 1992/3233 (Computer Programs) Regulations 1992 and SI 1997/3032 The Copyright and Rights in Database Regulations 1997.

5. Information management – the importance of application

KEY MESSAGE 4

To understand the different *contexts, needs, perceptions, attitudes and motives of users* in the way that information is applied.

KEY MESSAGE 5

To understand and be able to apply the range of techniques that can be used to *provide information to meet the specific needs of internal and external users.*

Within a business context it is important to always keep in mind the economic utilisation of an organisation's resources. Information is a resource and within a business environment applied information can be particularly valuable to not only the organisation itself, but to suppliers, customers and competitors. Both modern day and the more dated technology still in use can lead the ill-managed entity to perpetuate waste, especially in respect of information. People working within an organisation or making use of the outputs and services it provides are in a position to unwittingly waste its information resources. The adoption of effective management and control techniques is just as important in respect of information as it is in any other field of business activity.

Without effective management, in a business environment people can so easily use the organisation's information resource in an inappropriate way, and then go on to compound the error of their actions by inaccurate analysis of the facts gleaned. It is crucial to use the right type of information at the correct level of application if subsequent decisions and resultant actions are to be effective in serving the organisation's purpose.

An organisation of any type or size needs an information management policy in order to apply a number of basic principles in respect of determining the key points for the practical use of information. It is important to keep in mind the needs of all potential users and the guidance some may need in using information effectively. With regard to the development and use of information systems, procedures and processes, the aim should be to provide a clear definition of "information" and "knowledge" insofar as usage within the business and its applications is concerned.

An information management policy needs to cater for the management of internal and external communications (including formal information systems) so as to increase awareness and understanding. Adopting a particular style and maintaining minimum standards in written and spoken communications is necessary in order to bring clarity, quality, security and effectiveness into the decision making process. Properly managed, information will enhance the quality of business decisions, but only if the recipient's understanding can be applied using a range of management skills developed through continuing education and training.

Everyone working in any organisation needs to understand the importance of safeguarding the very valuable knowledge (held in its people) and information resources of the entity (held in its systems) both whilst undertaking its day to day operations and also, during those periods of disruption when staff leave, are seconded, or the entity itself goes through structural change such as during a take-over, buy-out,

re-organisation or merger. Furthermore, management needs to understand that information only becomes knowledge if it can be applied *within the skills and experience compass of the recipient.* This point is crucial to the effectiveness of decision-making processes within any organisation.

Another way to look at the relationship might be to always keep in mind a basic information systems management tenet;

INFORMATION x (KNOWLEDGE + UNDERSTANDING + EXPERIENCE) = DECISIONS

Cost / Benefit implications are just as important to consider in respect of information aggregation, distillation and interpretation. Information has a value related to its use, or in terms of its application within a timeframe of currency. In practice such value or benefit may not be for very long, but without adequate control the costs of providing it may go on being incurred long after such benefit has ceased. There is a need for ongoing review. The cost of providing information to should always be compared to the intrinsic benefit being gained from its use. The aim is to create a net benefit, which may not be easy to measure, but should in principle be applied in all decisions about systems development and information provision processes and methods irrespective of the technology approach being taken.

Management of the form, content, accessibility and presentation of information is key to its effective use. Without effective control there will be no reliable means of making sure that the level at which information is used will be appropriate to its intended purpose.

A variety of meanings can sometimes be drawn from the same information. It is important to recognise the level at which it is to be used, and the span of control of its intended purpose. In a business context information users are not just looking at the raw facts, they also need to be able to identify the inherent trends relationships, ratios between information elements, and the degree of interpolation and extrapolation that can be safely undertaken within workable tolerances. To be usable information must add sense and meaning in its application.

"Information overload" is a term becoming increasingly apparent in all types and sizes of organisations. A great deal of both internally generated and third party externally published information is available and circulating in most organisations. Some of it will be crucial to both the tactical and strategic needs of the organisation, but much of it will be utterly superfluous for immediate and longer-term use. It is important to recognise this phenomenon in all its wasteful guises.

The information management policy adopted should provide for proper recognition and understanding of information ownership, and deal with any restrictions regarding the timing, duration, method and extent of usage, so important for maintaining appropriate confidentiality. It should also cater for the development of yardsticks for use within the business so that those responsible may properly assess the value of such assets and thus exercise the necessary control at an appropriate level.

6. Non-financial information

KEY MESSAGE 1

To understand business and how organisations operate in order to *identify information critical to success.*

KEY MESSAGE 6

To be informed about and be able to *select and utilise the most appropriate tools and technology* from a well-designed form to the latest computer networks.

KEY MESSAGE 7

To be able to *promote and maintain a broad and balanced perspective* on how the organisation is moving towards and achieving its objectives.

Most financial management information arises as a consequence of the interaction of a number of factors, many of which are themselves non-financial. Effective information management, therefore, requires an understanding of how these factors truly interact.

For day-to-day management, a number of assumptions are made, allowing the use of a simplified, empirical model. Such models allow the most significant factors that affect the business to be taken into account in making short term decisions. Information can be gathered and assimilated quickly enough to make meaningful decisions. Such decisions can then lead to actions that will themselves be readily measurable. If a ship is headed for a reef, it is clearly more important to know what direction to steer to avoid shipwreck than to know, to within a few metres, precisely where the ship is. However the real danger in such a model is that its over-simplicity is gradually accepted as being a full reflection of the more complex model. When factors not included in the simplified model vary sufficiently to become significant, the empirical model breaks down. Such a change may arise from a gradual shift in the balance of several factors, or a dramatic change in an area that had previously never changed and had therefore not been considered significant. Many organisations had never considered the cost of energy as being particularly important until the oil crisis in the 1980s: the sudden dramatic rise in the cost of oil and all its derivatives fundamentally changed the cost structure of organisations, particularly those who saw themselves as low consumers of energy.

The effective information manager will need to ensure that the limitations of any simplified model are understood and, more importantly, that checks are in place to ensure the ongoing relevance of empirical models. Any information management system must ensure that its effectiveness is not lost as a consequence of over-complexity but also that it is sufficiently comprehensive to deliver the right degree of control.

Primary Information

Primary information arises in an infinity of formats. It is normally a measure of quantity – item count, size, weight, temperature, speed, density – the list is endless. The one thing all formats have in common is that they can be measured with some degree of precision. To be useful the information must be relevant to the management process it supports. It must be to a degree of accuracy that contributes to the control process. The effective information manager must appreciate the nature of the source and purpose of primary information.

Secondary Information

Many of the simplest control mechanisms will be an amalgam of a small number of primary sources. In most production systems the measurement of yield is seen as the fundamental unit of management, comparing input and output quantities. However, as the process becomes more complex, with a greater number of inputs and, possibly, several outputs, a simple comparison of inputs and outputs is insufficient to offer meaningful management information.

Conversely, the measure of one portmanteau unit may well prove sufficient for day-to-day control. Many restaurateurs are able to manage their business on the basis of the number of covers served in a sitting. Clearly this does not take into account the variability of customers' demands, but there is a limit to how much anyone can eat and drink at a single sitting!

Tolerances

Very few quantities can be measured with absolute precision. What is more important is that the measurement is made to the correct degree of accuracy. Greater accuracy is generally associated with greater effort in its collection. Conversely, if, in order to be useful, information must meet a specific level of accuracy, it must be gathered to that level of precision.

A significant area where this is relevant is where the control information is based on the difference between two primary measurements. Each of these measurements may be large, but the difference small by comparison. If the accuracy of each measurement cannot be guaranteed, an alternative method of deriving the difference by direct measurement may be required. Where measurements fluctuate with time, a degree of averaging may be necessary. Any control mechanism must be sensitive to such variability to avoid over-reaction to something that will right itself anyway. Conversely, suitably smoothed information may well indicate trends that are largely masked by the "noise" from these short-term fluctuations.

Information managers must take such factors into account. They must provide information that suits its purpose and is meaningful to the end user.

Quality

Any measure of quality is, inevitably, based on an initial set of subjective assumptions. In general a variety of quantifiable measures are defined as a consequence of a quality standard and quality is assumed to be satisfactory if these criteria are met.

The basis on which such criteria are set must be clearly understood and the relevance to the decision-making they support kept under review. In particular, where quality standards are based on highly subjective factors like public taste and fashion, care must be taken to ensure that changes are tracked accurately and properly reflected in quality-based standards within the organisation.

Critical success factors

In many activities, the progress of the enterprise is measured against a series of critical success factors (CSFs). At the top of the organisation, each strategic corporate goal can be elaborated into a series of CSFs, which must be quantifiable. Once quantified targets can be set and compared to results achieved at the top, the same technique can cascade down the organisation. In order to be effective, many CSFs must be defined in non-financial terms, such as market share or plant throughput.

Information management systems must be able to support the definition and measurement of such performance indicators. It may well be that the information manager will need to take an active role in the establishment of CSFs, ensuring that they are a true measure of the goal they reflect.

Research information

Much of the research information employed by the enterprise is of a non-financial nature. In addition, research frequently reveals information that it never set out to find! Indeed, many business successes owe their origins to re-working of research data. 3M never intended to develop the PostIt note. They were simply trying to produce a glue that would hold several sheets of a form together, whilst allowing their subsequent separation without damage. The challenge to the information manager is to ensure that such opportunities can be exploited. That requires rather more than a large data warehouse with powerful computer looking for trends.

7. In conclusion

There is no doubt that computer and telecommunications technology will continue to develop, providing more capabilities and providing more speed for connection to and transfer of information. The end of the 1990's saw rapid growth in numbers of users of the World Wide Web and associated technologies which make vast amounts of data easily accessible. The form and flow of information will change as will the content. As a consequence understanding how to find the right information and how it should be processed is often overlooked in the race for speed and efficiency of information flows. It has always been difficult to gather the correct data for the correct purpose. Changes in technology have made this even more of a challenge.

What remains constant is the need for individual human information processors to interpret and act upon the information using their own knowledge and experience, whatever tools are available. The technology of the fountain pen is impressive, but it does not affect the information produced by the person doing the writing. Technology should not be the driving force of Information Management; it should be its faithful servant.

Using the model developed by the task force will help to identify the elements and dimensions of information management. We have successfully applied this model to a variety of situations, and real examples are included in the annexes. Technology may change the nature of collection, processing, storage, retrieval and exploitation of information but the principles remain the same.

Appendix

The model has been applied to illustrate examples of Information Management. It has been approached in different ways to show its universal applicability and versatility.

We gratefully acknowledge the assistance given by Sports and Corporate Flags UK Ltd, Morpeth, Northumberland, for allowing us to use the information in Example 1.

Example 1:   Manufacturing (Jim Sellen)
Example 2:   Retailing (Trevor Bentley)
Example 3:   The Editorial Process in Publishing (George Glass)
Example 4:   The CIMA Membership System (William Hall)

EXAMPLE 1: MANUFACTURING
Compiled by Jim Sellen

Background

1. Flagmaking is a specialist manufacturing operation which uses a range of techniques and technologies depending on the type and size of the flag, and the material from which it is made.

2. Bunting produced from knitted polyester, plasticloth or polythene tape is used for the main flag to which is incorporated the hemming, rod and cord.

3. All shapes and sizes are manufactured – printed, sewn, or appliqued. PVC banners can incorporate computer cut lettering, screen printing, or hand painting techniques.

4. Key to the company's success is the ability to obtain very detailed specifications regarding size complexity of design and colours, to accurately cost the artwork, materials and manufacturing requirements, and to then price a quotation in the knowledge that a quick response order can be produced and despatched anywhere in the world to meet the customer's requirements. Competition is fierce from a great number of inferior quality producers.

5. The attached matrix using the CIMA Information Management Core Model reflects the various activities and elements involved.

↓Element →Dimension	PURPOSE	STANDARDS	CONTENT	MECHANISMS
Collecting	Customer data base details Salesman / area statistics Product demand profiles Enquiry initiation statistics	Quality specifications Order acceptance procedure Complaints policy Credit control policy	Order history Payment history Order specification Contact details & shipping location	Fax/phone/e-mail/post Proprietary accounting software Salesman weekly report sheets
Processing	Ascertain material availability Cost design materials & production Price quotation Salesman commission calculation	Gross margin parameters Credit limit within terms Payment before acceptance of order Commission structure	Artwork Job costing Job pricing Production specs.	Design software Proprietary accounting software Fax/phone/e-mail/post Job cards Written production schedules
Storage	Job specs Stock details WIP details Special instructions Commission payment due	Customer profile within Data Protection Act Credit worthiness profile Standard carrier rates Commission structure	Customer profile & account status Materials stock Work in progress Finished goods awaiting despatch Standard sales price list & discount Supplier price lists	Order processing software Hard copy files Stock accounting software Job Card Accounting software
Delivery	Design / artwork for customer Ditto for production. Invoice to customer Payment of salesman commission Receipt of sales invoice settlement Payment of supplier invoice	Terms codes VAT parameters Trading terms & conditions Commission amount payment Treasury function policy	Size colour quantity costs prices trimmings waste % Gross margin Debtor days Gross VAT Net Qty. Rate Commission payment Customer receipt confirmation	Fax/phone/e-mail/post Proprietary accounting software BACS Credit card account Completed production schedules Completed job cards
Sharing	Customer requirements Other info. for make-up / despatch Enquiry / quotation / order status	Customer credit worthiness Complaints shorts damage progress Order status Complaints review analysis	Customer profile Production. Capacity / Schedule. Materials availability Postage / freight charges	Catalogues/marketing flyers Company complaints procedures Shift production meeting notes Order processing software Parcels courier price lists

With acknowledgement to Sports & Corporate Flags UK Ltd, Morpeth, Northumberland.

EXAMPLE 2 - RETAILING

Compiled by Trevor Bentley

The retailing industry is facing massive change with the advent of internet and home shopping, the growth of in-town convenience stores and out-of-town hyper discount stores, and a return to specialist high street shops. All of these depend on technology for logistics and giving excellent customer service.

This matrix provides an overview of the information management needs of this diverse and changing industry.

↓ Element → Dimension	Purpose	Content	Standards	Technologies
Gathering	Customers Profiles	Shopping profile in terms of products and spend	Accurate personal data Customer access / confirmation	Loyalty/Account Cards Point of Sale
Processing	Shopping Habits Customer Spend	Shelf-management data	Customer Updating	Store based system Large central system
Retaining	Access to profiles Home Shopping	Product Availability Shopping Profiles	Regular File Cleaning	Large data base Data warehousing
Sharing	Target Customers	Targeting with offers	Frequent Feedback Loops	Home computers Telecommunications Links
Applying	Increased sales via increased customer spend	High % satisfaction response	Personalised service matching need with supply	Home computer quality reports In-store customer response terminals

**EXAMPLE 3: THE INFORMATION MANAGEMENT MODEL APPLIED TO THE EDITORIAL PROCESS
IN PUBLISHING
Compiled by George Glass**

It shows two versions of the model; one describing the whole process, the second, the four stages
involved. This illustrates how a different level of detail can be described within the overall structures of
the model.

The overview

Gathering	Processing	Retaining	Sharing	Applying	Purpose	Content	Standards	Technologies
Ideas and pictures	Assemble words and page layout	Store finished page	Peer group review	Create finished paper page	Offer information to reader	Ideas and stories	Language and editorial style	Print on paper

The same process in four iterations

Gathering	Processing	Retaining	Sharing	Applying	Purpose	Content	Standards	Technologies
Idea	Express in words	Write notes	Offer concept to editor	Create concept draft	Stimulate discussion	Sketch of an idea	Language; syntax	Pen on paper
Collate concept drafts	Elaborate into story	Save as WP draft	Peer group review of story	Create story draft	Explain full implication of story	Complete picture	Full sentences; logical structure; spelling	Word-processor; spell-checker; disk storage
Assemble draft and pictures	Sub-edit for style and length	Save with other parts of page	Identify other stories with common theme	Save to fileserver	Show complete story fully styled with pictures	Structured story	Story length; house style; relevance of pictures	Graphics creation; image manipulation; local area network
Assemble components of page	Lay out complete page	Save as complete page	Editorial review of entire page	Transfer to typesetter	Provide complete pages for reader	Complete story in full editorial context	Legal; headline style; picture size and crop	Page make-up software; digital transmission

**EXAMPLE 4: THE CIMA MEMBERSHIP SYSTEM
Complied by William Hall**

The Membership System is shown in diagrammatic form below. Essentially it operates as a large sales
ledger with over 100,000 customers who are either members or students. The details that follow are
necessarily very abbreviated.

The detail retained for each customer is limited because of the logistical problems and economics of
keeping it up to date. Members should, but do not always, inform the Institute of changes to their details.

Gathering
Basic details such as name, date of birth, date of joining and grade changes, home address, business
address, branch interests, membership of Council or committees are recorded. For students examination
progress is noted including paper status or exemptions granted. Changes may be advised by members
through returning forms, letters, phone calls or e-mails. Payment may be effected by direct debit, cheque
with or without a bar coded remittance advice or credit card details.

Processing

Data is entered via keyboard and where appropriate subjected to range checks. UK postal addresses can be generated from the post code in creating a new address but this may be supplemented by additional address information where required. Some categorisation is undertaken to facilitate statistical analysis. For example job titles are grouped eg Director Finance, Finance Director, Director of Finance, Financial Director and Chief Financial Officer will all be grouped under one heading for analysis and selection. However the individual title will be recorded against each member. As payments are received the balance outstanding for an individual is adjusted accordingly. On certain calendar dates charges are generated. For example as at 1st January subscriptions are debited to each individual.

Retaining

Whilst information may not be updated every day it may be scanned for statistical analysis. Data audit is a part of the statistical analysis so that when unexpected results are obtained it initiates an investigation into data soundness. Security dumps are taken nightly in case of system loss through fire or other damage.

Sharing

The information in the system may be output via screens showing what is held. Printed output is substantial and may be in the form of address labels for branch mailings, the monthly edition of 'Management Accounting', subscription demands, examination results or statistical analyses.
On occasion it is output onto tape to send to a printer to produce large mailings or to the producer of CD ROM's for the members year book. It is also possible to obtain data direct into spreadsheets via the network which links the membership system with individual staff PC's.

Applying

The statistical data derived from over 100,000 entries is used to project various scenarios. For example likely growth rates, areas of growth and potential levels of retirement (which is of interest to the Benevolent Fund).

Purpose

The main purpose for collecting data about members and students is to provide an authoritative record at an individual level and to facilitate communication. Having collected the data it is available at an aggregated level for various analyses or groupings.

Content

The content is words and numbers only. At this stage it is not intended to hold images of members or students although in some circumstances this could be useful. For example in cases of alleged impersonation it could provide very useful evidence.

Standards

For basic information such as name address etc complete accuracy is essential. For company classification it is desirable but if it is not provided nor obtainable the omission will not have a material effect on statistical analyses. Range checks are built into the system where appropriate.

Technologies

Years ago all the information was held on a card index. That has given way to computerised records which allow over 100,000 records to be analysed and retrieved many times a day according to needs.
Bar codes are used to input data where documents are returned from members or students. Scanning is also gaining wider use for document retention.

Conclusion

It can be seen that the CIMA membership system complies with the basic Information Model as developed. Even if substantial improvements are made to the system by the addition of marketing information the model will still apply.

CHARTERED INSTITUTE OF MANAGEMENT ACCOUNTANTS MEMBERSHIP SYSTEM

| Gathering | Member details | Business address | Examination entries | Payment received | | Purpose |

IBM RS2000 Oracle Database

Validate data

Generate subscription demands etc on due date

Update financial balances

Process exam data

| Processing | | Content |
| Retaining | | Standards |

Security dumps nightly

| Sharing | | Technologies |

| Applying | Labels for mailing | Exam instructions, etc | Subscription demands | Statistics | Tear book details |